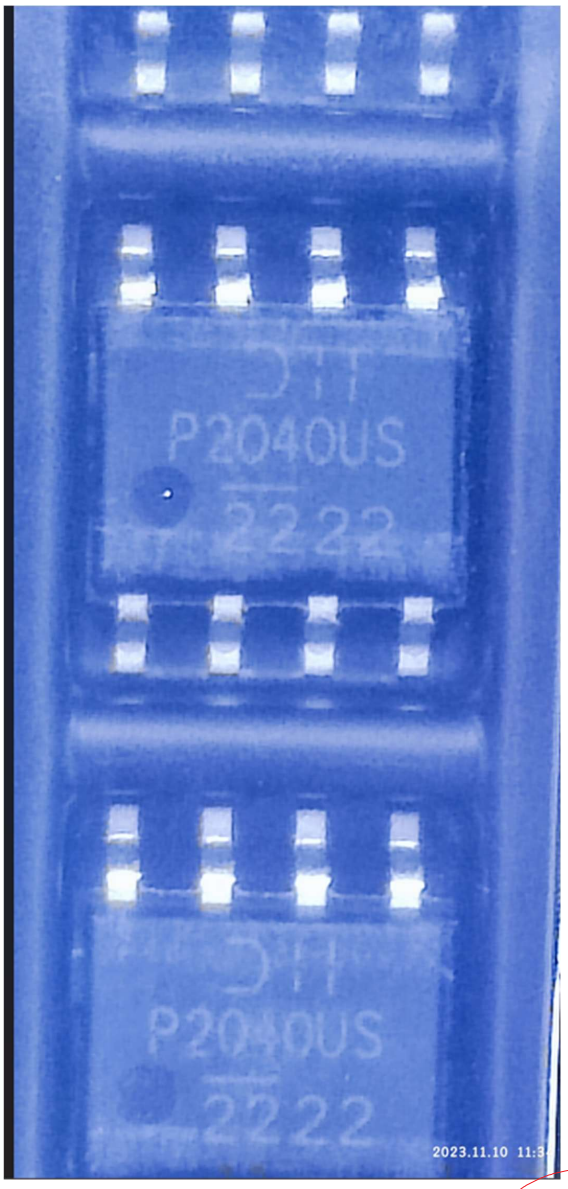


設計驗證
工程課
2023.11.10
發行
致鍵科技開發股份有限公司

Zenitron Corporation

增 你 強 股 份 有 限 公 司

台 北 市 內 湖 區 新 湖 二 路 250 巷 8 號

TEL: (02)2792-8788 FAX: (02)2792-8909

業務承辦人員: 林 于 倫 / Erin Lin EXT: 233

APPROVAL SHEET

公司名稱: 鈺緯科技開發股份有限公司

零件種類: MOSFET

零件編號: DMP2040USS-13

客戶料號: 3BDMP20401Y (B0135)

零件包裝: SOIC-8

製造廠商: DIODES

設計驗證 工程課 2023.11.10 發行 鈺緯科技開發股份有限公司

承認單位

承認日期 2023/11/08

DMP2040USS

P-CHANNEL ENHANCEMENT MODE MOSFET

Product Summary

BV_{DSS}	$R_{DS(ON)}$ Max	I_D Max T_A = +25°C
-20V	33mΩ @ V_{GS} = -4.5V	-7.0A
	52mΩ @ V_{GS} = -2.5V	-5.5A

Features and Benefits

- Low On-Resistance
- Low Gate Threshold Voltage
- Low Input Capacitance
- Fast Switching Speed
- Low Input/Output Leakage
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**

Description and Applications

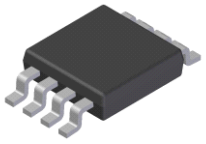
This MOSFET is designed to minimize the on-state resistance ($R_{DS(ON)}$) and yet maintain superior switching performance, making it ideal for high efficiency power management applications.

- Backlighting
- Power Management Functions
- DC-DC Converters

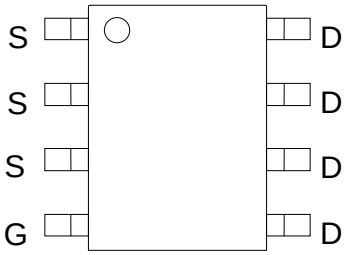
Mechanical Data

- Case: SO-8
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals Connections: See Diagram
- Terminals: Finish - Matte Tin Annealed over Copper Lead Frame. Solderable per MIL-STD-202, Method 208 e3
- Weight: 0.072g (Approximate)

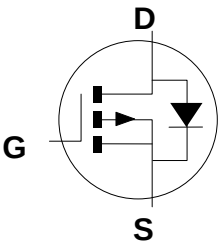
SO-8



Top View



Top View
Pin-Out



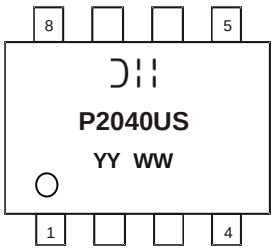
Equivalent Circuit

Ordering Information (Note 4)

Part Number	Case	Packaging
DMP2040USS-13	SO-8	2500/Tape & Reel

Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
2. See https://www.diodes.com/quality/lead-free/ for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
4. For packaging details, go to our website at https://www.diodes.com/design/support/packaging/diodes-packaging/.

Marking Information



= Manufacturer's Marking
P2040US = Product Type Marking Code
YYWW = Date Code Marking
YY or YY= Year (ex: 19 = 2019)
WW = Week (01 to 53)

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Maximum Ratings (@T_A = +25°C, unless otherwise specified.)

Characteristic			Symbol	Value	Unit
Drain-Source Voltage			V_{DSS}	-20	V
Gate-Source Voltage			V_{GSS}	±12	V
Continuous Drain Current (Note 6) V_{GS} = -4.5V	Steady State	T_A = +25°C	I_D	-7.0	A
		T_A = +70°C		-5.5	
Continuous Drain Current (Note 7) V_{GS} = -4.5V	Steady State	T_C = +25°C	I_D	-15	A
		T_C = +70°C		-12	
Pulsed Drain Current (10µs Pulse, Duty Cycle = 1%)			I_{DM}	-30	A
Continuous Source-Drain Diode Current (Note 6)			I_S	-2.2	A
Avalanche Current (Note 8) L = 0.1mH			I_{AS}	-16	A
Avalanche Energy (Note 8) L = 0.1mH			E_{AS}	13.5	mJ

Thermal Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic		Symbol	Value	Unit
Total Power Dissipation (Note 5)	T_A = +25°C	P_D	1.4	W
Thermal Resistance, Junction to Ambient (Note 5)	Steady State	$R_{\theta JA}$	91	°C/W
Total Power Dissipation (Note 6)	T_A = +25°C	P_D	1.9	W
Thermal Resistance, Junction to Ambient (Note 6)	Steady State	$R_{\theta JA}$	64	°C/W
Thermal Resistance, Junction to Case (Note 7)	Steady State	$R_{\theta JC}$	13.5	°C/W
Operating and Storage Temperature Range		T_J, T_{STG}	-55 to +150	°C

Electrical Characteristics (T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 9)						
Drain-Source Breakdown Voltage	BV_{DSS}	-20	—	—	V	V_{GS} = 0V, I_D = -250µA
Zero Gate Voltage Drain Current	I_{DSS}	—	—	-1	µA	V_{DS} = -16V, V_{GS} = 0V
Gate-Source Leakage	I_{GSS}	—	—	±100	nA	V_{GS} = ±12V, V_{DS} = 0V
ON CHARACTERISTICS (Note 9)						
Gate Threshold Voltage	$V_{GS(TH)}$	-0.6	—	-1.5	V	V_{DS} = V_{GS}, I_D = -250µA
Static Drain-Source On-Resistance	$R_{DS(ON)}$	—	26	33	mΩ	V_{GS} = -4.5V, I_D = -8.9A
		—	37.5	52		V_{GS} = -2.5V, I_D = -6.9A
Diode Forward Voltage	V_{SD}	—	-0.7	-1.2	V	V_{GS} = 0V, I_S = -2.9A
DYNAMIC CHARACTERISTICS (Note 10)						
Input Capacitance	C_{iss}	—	834	—	pF	V_{DS} = -10V, V_{GS} = 0V, f = 1.0MHz
Output Capacitance	C_{oss}	—	133	—		
Reverse Transfer Capacitance	C_{rss}	—	105	—		
Gate Resistance	R_g	—	4.9	—	Ω	V_{DS} = 0V, V_{GS} = 0V, f = 1.0MHz
Total Gate Charge (V_{GS} = -4.5V)	Q_g	—	8.6	—	nC	V_{DS} = -6V, I_D = -8.9A
Total Gate Charge (V_{GS} = -8V)	Q_g	—	19	—		
Gate-Source Charge	Q_{gs}	—	1.5	—		
Gate-Drain Charge	Q_{gd}	—	2.5	—		
Turn-On Delay Time	$t_{D(ON)}$	—	5.8	—	ns	V_{DD} = -6V, R_L = 6Ω, V_{GS} = -4.5V, R_g = 6Ω, I_D = -1A
Turn-On Rise Time	t_R	—	7.7	—		
Turn-Off Delay Time	$t_{D(OFF)}$	—	28.1	—		
Turn-Off Fall Time	t_F	—	14.6	—		
Body Diode Reverse Recovery Time	t_{RR}	—	9.8	—	ns	I_F = -8.9A, di/dt = -100A/µs
Body Diode Reverse Recovery Charge	Q_{RR}	—	2.7	—	nC	I_F = -8.9A, di/dt = -100A/µs

Notes:
5. Device mounted on FR-4 PC board, with minimum recommended pad layout, single sided.
6. Device mounted on FR-4 substrate PC board, 2oz copper, with thermal bias to bottom layer 1inch square copper plate.
7. Thermal resistance from junction to soldering point (on the exposed drain pad).
8. I_{AS} and E_{AS} ratings are based on low frequency and duty cycles to keep T_J = +25°C.
9. Short duration pulse test used to minimize self-heating effect.
10. Guaranteed by design. Not subject to product testing.

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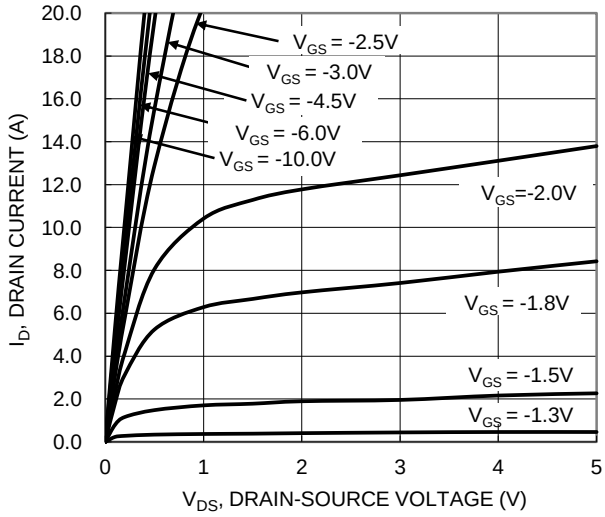

Figure 1. Typical Output Characteristic

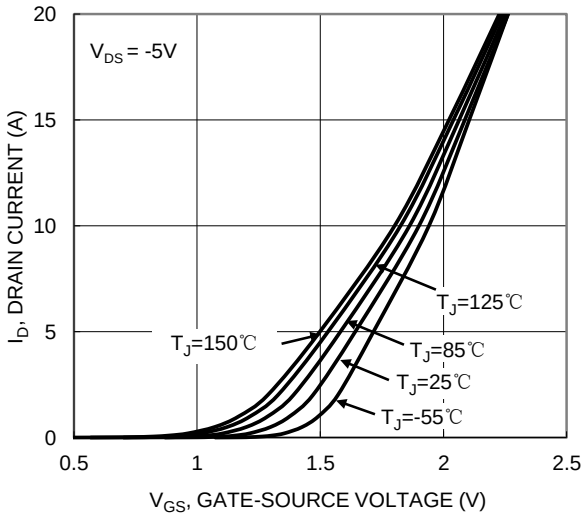

Figure 2. Typical Transfer Characteristic

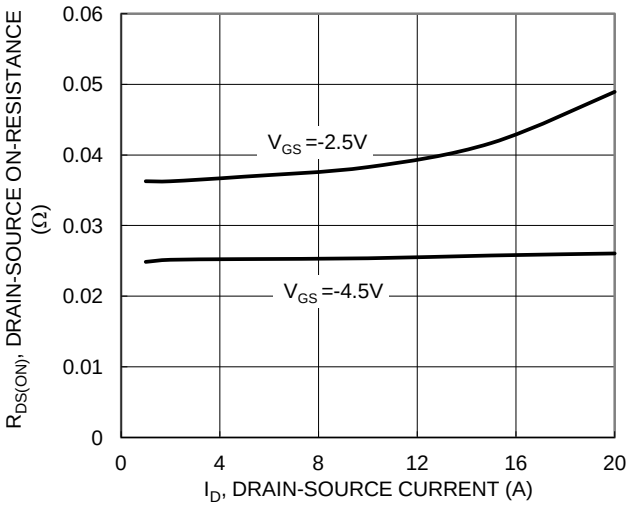

Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage

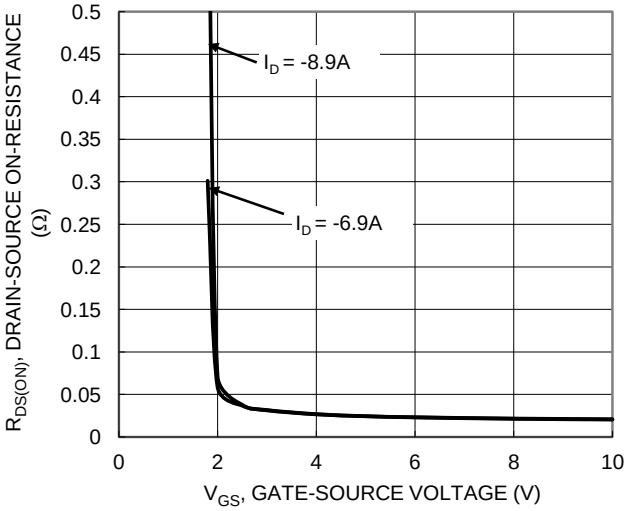

Figure 4. Typical Transfer Characteristic

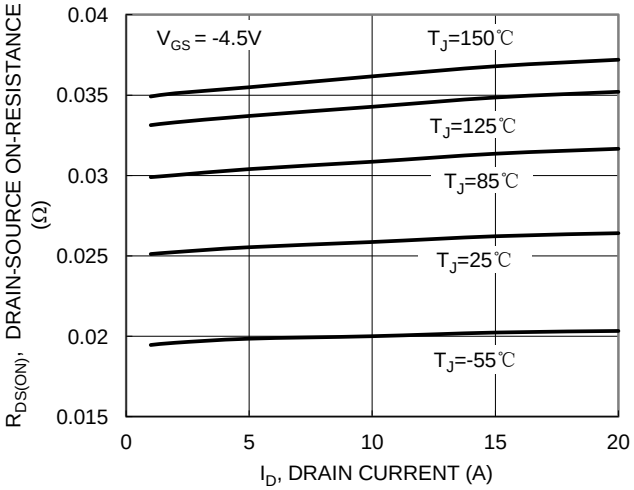

Figure 5. Typical On-Resistance vs. Drain Current and Junction Temperature

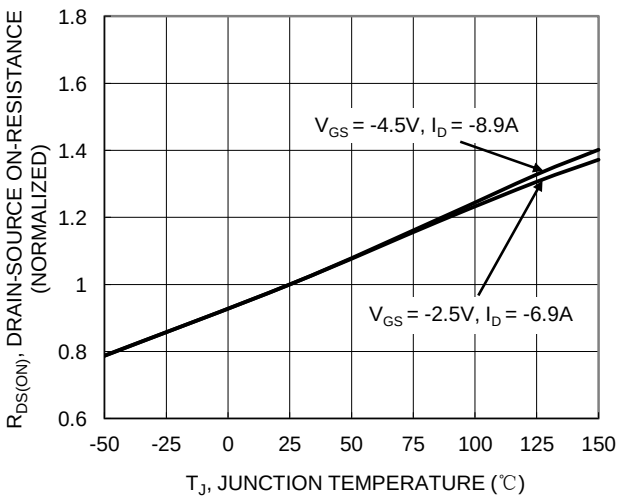

Figure 6. On-Resistance Variation with Junction Temperature

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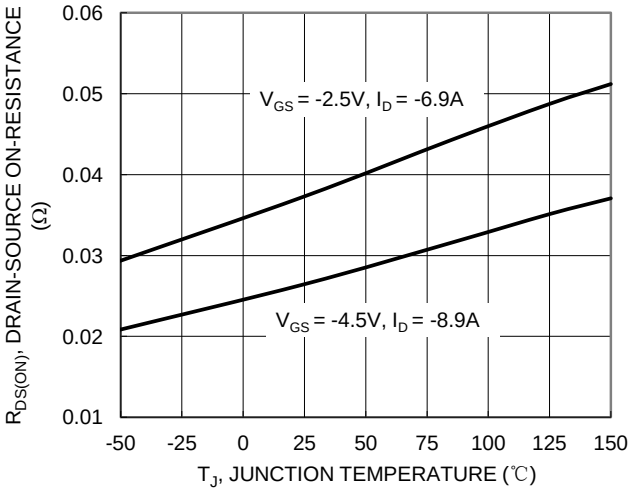

Figure 7. On-Resistance Variation with Junction Temperature

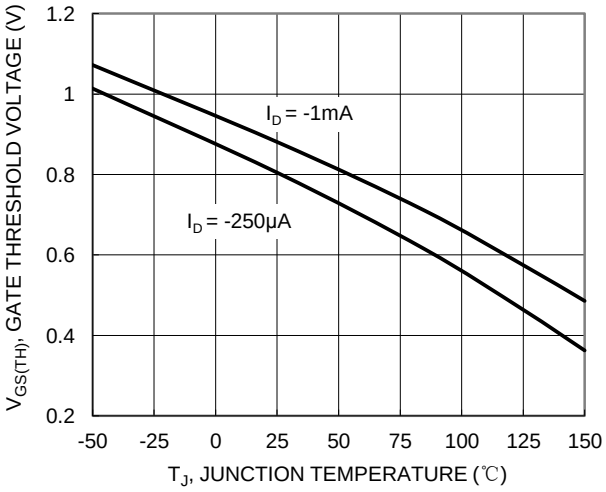

Figure 8. Gate Threshold Variation vs. Junction Temperature

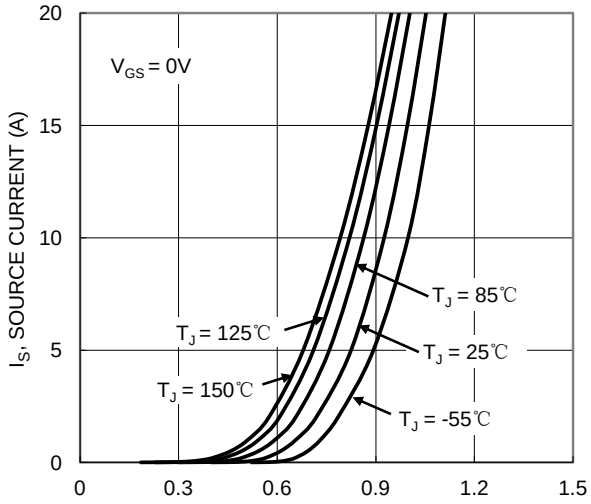

Figure 9. Diode Forward Voltage vs. Current

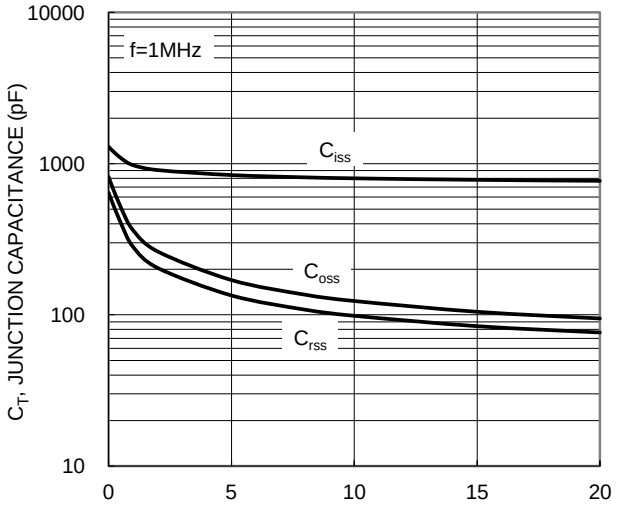

Figure 10. Typical Junction Capacitance

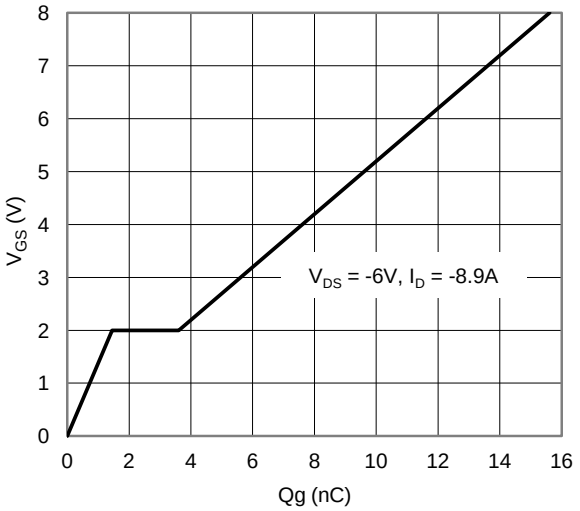

Figure 11. Gate Charge

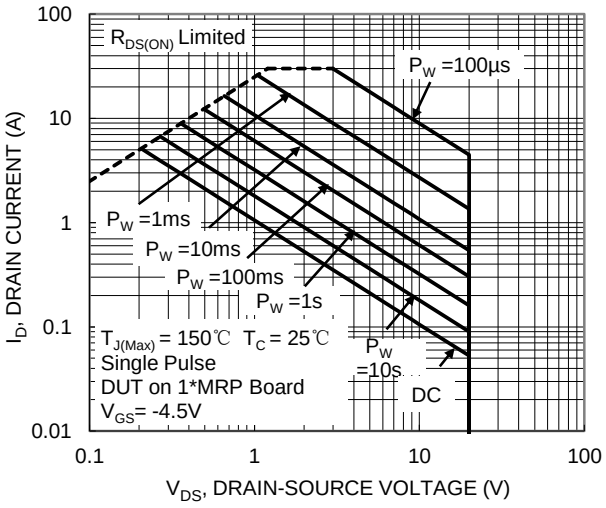

Figure 12. SOA, Safe Operation Area

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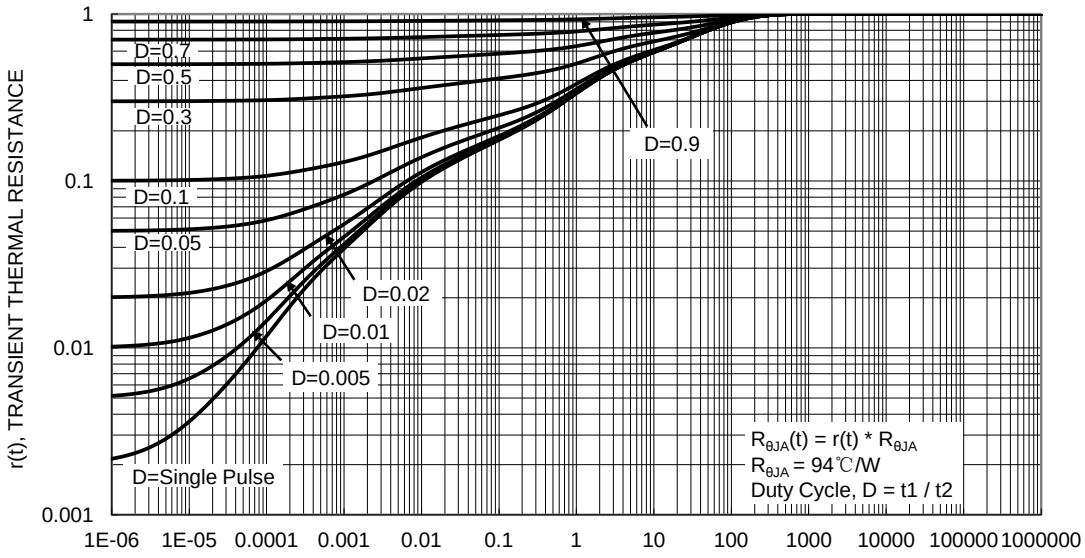

Figure 13. Transient Thermal Resistance

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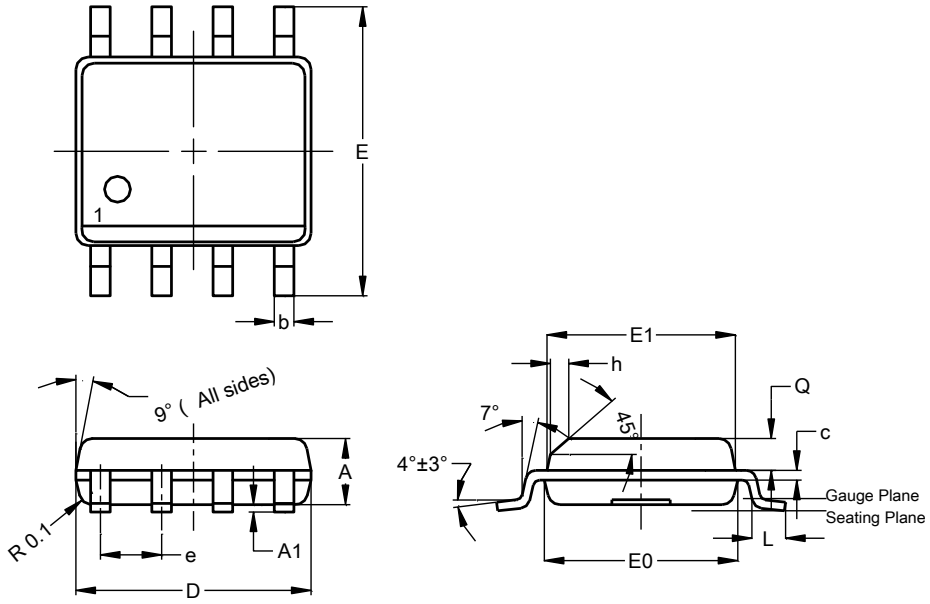
Package Outline Dimensions

Please see http://www.diodes.com/package-outlines.html for the latest version.

SO-8

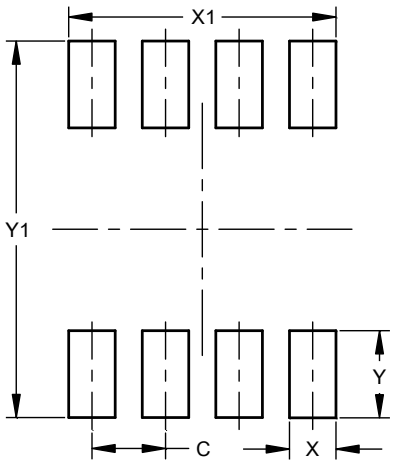


SO-8			
Dim	**Min**	**Max**	**Typ.**
A	1.40	1.50	1.45
A1	0.10	0.20	0.15
b	0.30	0.50	0.40
c	0.15	0.25	0.20
D	4.85	4.95	4.90
E	5.90	6.10	6.00
E1	3.80	3.90	3.85
E0	3.85	3.95	3.90
e	--	--	1.27
h	--	--	0.35
L	0.62	0.82	0.72
Q	0.60	0.70	0.65
All Dimensions in mm			

Suggested Pad Layout

Please see http://www.diodes.com/package-outlines.html for the latest version.

SO-8



Dimensions	Value (in mm)
C	1.27
X	0.802
X1	4.612
Y	1.505
Y1	6.50

設計驗證
工程課
2023.11.10
發行
旺宏科技開發股份有限公司

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Surface Mount (SMD) Packaging

Reel and Carrier Tape Specifications

MINIMUM PACKING QUANTITY						
PACKAGE TYPE		Bulk Type Quantity	7" Tape and Reel		13" Tape and Reel	
			Quantity	Part Number Suffix	Quantity	Part Number Suffix
DBF		NA	NA	NA	3k	-13
DFN / QFN Series	*(Notes 4, 11)*	NA	3k	-7 , -7R, TA	10k	-13, -13R
DFN0603		N/A	10k	-7 , -7B	NA	NA
DFN0806		NA	10k	-7B	NA	NA
DFN0808 , DFN0910		NA	5k	-7	NA	NA
DFN1006		NA	3k	-7 , -7R	10k	-13
			10k	-7B	NA	NA
DFN1010		NA	5k	-7, -7R	NA	NA
			10k	-7B	NA	NA
DFN1409 , DFN1410		NA	5k	-7	NA	NA
DFN1410-4		NA	4k	-7	NA	NA
DFN1610-2 Type B		NA	10k	-7,-7-84	NA	NA
DFN2020-8 Type E	*(Note 6)*	NA	3k	-7 , -7B	NA	NA
DFN2020-3/SWP Type A	*(Note 6)*	NA	0.5k	-7A	NA	NA
DFN/QFN3030 Series	*(Note 5)*	NA	3k	-7, -7A	3k	TC, -13, -13R
					5k	-13
DFN3030-8 Type E	*(Note 6)*	NA	2k	-7A	3k	-13A
DFN3030-8 Type K, R	*(Note 6)*	NA	1.5k	-7A	3k	-13
DFN3333-8		NA	2k	-7	3k	-13
DFN3035-8	*(Note 6)*	NA	NA	NA	5k	-13
DFN3810-9 Type B	*(Note 6)*	NA	5k	-7	NA	NA
DFN4030-12, DFN3030-12 Type A1		NA	NA	NA	3k	-13
DFN4030-12 Types B, C, D		NA	NA	NA	4k	-13
DFN5020		NA	3k	-7	NA	NA
DFN5060		NA	NA	NA	3k	-13
DF-S		50	NA	NA	1.5k	-T
D-FLAT		NA	NA	NA	10k	-13
D^2PAK		NA	NA	NA	800	-T
DO-218		NA	NA	NA	750	-13
DO-219AA		NA	3k	-7, -7D	10k	-13, -13D
DSN/ESN/TSN/WLB	*(Notes 10 & 11)*	NA	3k	-7	NA	NA
			10k	-7B		
FLGA2520		NA	2.5k	-7	NA	NA
HBS		NA	NA	NA	2.5k	-13
HDS		NA	NA	NA	3k	-13
HMSOP-10		NA	NA	NA	3k	-13
HSOP-28		NA	NA	NA	1k	-13
HTSSOP-14		NA	NA	NA	4k	-13
LGA1616-8		NA	3k	-7	NA	NA
L-QFP7070-48EP		NA	NA	NA	2k	-13
MBS		NA	NA	NA	3k	-13
MELF		NA	NA	NA	5k	-13
MiniDIP		NA	NA	NA	3k	-T
MiniMELF		NA	2.5k	-7	10k	-13
MSB		NA	NA	NA	3k	-13
MSBL		NA	NA	NA	2.5k	-13
MSOP [-8, -8EP, -10]	*(Note 5)*	100	1k	TA	2.5k	-13
					3k	-13
					4k	TC
PowerDI®5	*(Note 7)*	NA	1.5k	-7 , -7D	5k	-13 , -13D
PowerDI®5SP		NA	NA	NA	3.5k	-13, -13R

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MINIMUM PACKING QUANTITY - Continued						
PACKAGE TYPE		Bulk Type Quantity	7" Tape and Reel		13" Tape and Reel	
			Quantity	Part Number Suffix	Quantity	Part Number Suffix
PowerDI®5SP-B	*(Note 8)*	NA	NA	NA	3k	-13, -13R
PowerDI®123 , PowerMITE®3		NA	3k	-7	10k	-13
PowerDI®1012		NA	NA	NA	1.5k	-13
PowerDI®3030		NA	3k	-7	NA	NA
PowerDI®3333		NA	2k	-7	3k	-13
PowerDI®3333-8 Type D	*(Note 6)*	NA	1k	-7, -7A	3k	-13, -13A
PowerDI®5060		NA	NA	NA	2.5k	-13
PowerDI®8080-5		NA	NA	NA	2k	-13
QFN3040		NA	NA	NA	3k	-13
QFN3535		NA	NA	NA	5k	-13
QFN4040	*(Notes 5,6)*	NA	1.5k	-7	4k	-13
					5k	-13
					3k	TC
QFN4040-17		NA	NA	NA	2.5k	-13
QFN4040-20 Type A1 QFN4040-24 Type A1	*(Note 6)*	NA	NA	NA	3k	-13
QFN4040-24	*(Note 6)*	NA	NA	NA	3.5k	-13R
QFN5050-32	*(Note 6)*	NA	NA	NA	2.5k	-13R
QFN5050-40	*(Note 6)*	NA	NA	NA	3.5k	-13R
QFN6060-48, QFN5050-80	*(Note 6)*	NA	NA	NA	3k	-13R
QSOP [-16, -20]		NA	NA	NA	2.5k	TC
SC59		NA	3k	-7	10k	-13
SM-8		NA	1k	TA	4k	TC
SMA		NA	NA	NA	5k	-13
SMAF, SMA-FS		NA	NA	NA	10k	-13
SMB, SMC		NA	NA	NA	3k	-13
SOD123, SOD123F, SOD323		NA	3k	-7, TA	10k	-13, TC
SOD523		NA	3k	-7	10k	-13, TC
		NA	6k	-76	NA	NA
SOD923		NA	10k	-7	NA	NA
SO [-7, -8, -8EP]	*(Note 5)*	100	0.5k	TA	2.5k	-13, TC
					4k	-13
SO-14	*(Note 5)*	100	NA	NA	2.5k	-13
					4k	-13
SO-16	*(Note 5)*	50	NA	NA	2.5k	-13
					4k	-13
SO [-20, -24, -28]		NA	NA	NA	1k	-13
SO-28 Type TH		NA	NA	NA	1.5k	-13
SOPA-4		NA	NA	NA	5k	-13
SOT23		NA	3k	-7, TA	10k	-13
		NA	0.5k	TD		
SOT323, SOT353		NA	3k	-7, TA	10k	-13, TC
SOT523, SOT666		NA	3k	-7, TA	10k	-13
SOT363		NA	3k	-7, -7R	10k	-13, -13R
SOT25, SOT26, SC74R		NA	3k	-7, TA	10k	-13, TC
SOT23F		NA	3k	TA, -7	10k	TC
SOT89		NA	1k	-7, TA, -7R	2.5k	-13
					4k	TC, -13R
SOT89-5		NA	1k	-7	2.5k	-13
SOT143		NA	3k	-7	10k	-13
SOT223		75	1k	TA	2.5k	-13
					4k	TC

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MINIMUM PACKING QUANTITY - Continued						
PACKAGE TYPE		Bulk Type Quantity	7" Tape and Reel		13" Tape and Reel	
			Quantity	Part Number Suffix	Quantity	Part Number Suffix
SOT553	*(Note 9)*	NA	3k	-7	NA	NA
		NA	4k	-7	NA	NA
SOT563	*(Note 9)*	NA	3k	-7, -7A	10k	-13, -13A
		NA	4k	-7	NA	NA
		NA	8k	-7B	NA	NA
SOT953		NA	10k	-7,	NA	NA
SOT963		NA	10k	-7, -7A, -7B	NA	NA
SSOP-8		NA	3k	-7	NA	NA
SSOP [-10, -16]		NA	NA	NA	2k	-13
SSOP-20		NA	NA	NA	4k	-13
SSOP-24		NA	NA	NA	2.5k	-13
T-MiniDIP		NA	NA	NA	5k	-13
TO252-3, TO252-4, TO252-5		80	NA	NA	2.5k	-13, TC
TO263AB, TO263-5		50	NA	NA	800	-13
TSSOP [-8, -14, -16, -16EP]	*(Note 5)*	96	NA	NA	2.5k	-13
					4k	-13
TSSOP [-20, -24, -28]		NA	NA	NA	4k	-13
TSSOP-24EP		NA	NA	NA	2.5k	-13
TSOT25, TSOT26		NA	3k	-7, TA	10k	-13
			0.5k	TD	NA	NA
TT, TTL		NA	NA	NA	1.5k	-13
DSN/ESN/WLB Series	*(Notes 10 & 11)*	NA	3k	-7	NA	NA
			10k	-7B		
VSSOP-8		NA	3k	-7	NA	NA
WLB1006, WLB1406, WLB1608		NA	5k	-7	NA	NA
X4-DSN1006-3	*(Note 6)*	NA	10k	-7, -7A	NA	NA
X2-DSN1010-3	*(Note 6)*	NA	5k	-7, 7A	NA	NA

Notes:
1. Package quantities given are for minimum packing quantity only, not minimum order quantity. For minimum order quantity, please contact Sales Department.
2. No mixed date codes or partial quantity (less than minimum packing quantity) is allowed.
3. In no case shall there be two or more consecutive components missing from any reel for any reason.
4. Applies to all DFN/QFN body sizes unless specified otherwise in the table. 13" reel may not be available in all packages. Refer to product datasheet for details.
5. For 13" reel packing quantity, refer to product datasheet for specific details.
6. Customer specific requirement.
7. POWERDI®5 available in 5k quantity in 13-inch reel & 12mm tape (part number suffix "-13D").
8. POWERDI®5SP-B part number suffix "-13R" is supplied with device in flipped orientation .
9. SOT553 / SOT563 quantity of 4k in 7-inch reel applies to Logic products.
10. Applies to all DSN/ESN//TSN/WLB body sizes unless otherwise specified in the table.
11. For DFN/QFN/WLB/DSN/ESN/TSN/WLB, the quantity applies regardless of package seated height (i.e. prefix V, W, U, X1, X2, etc) unless specified otherwise.

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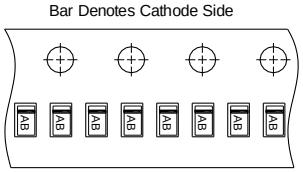
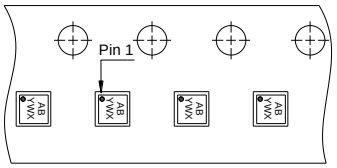
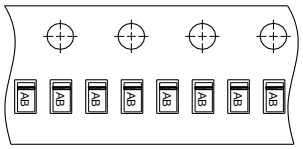
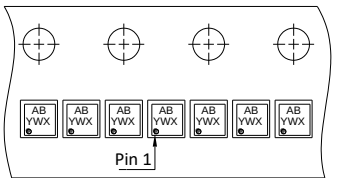
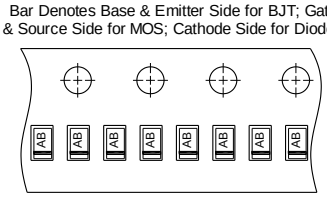
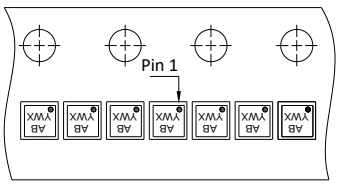
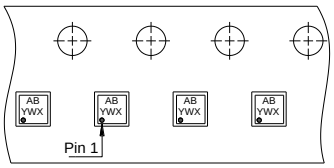
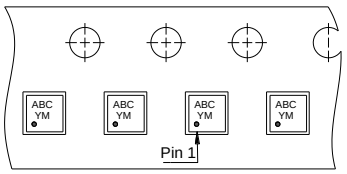
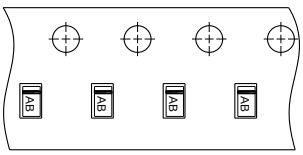
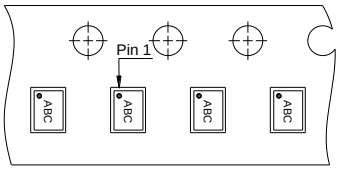
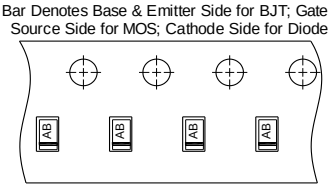
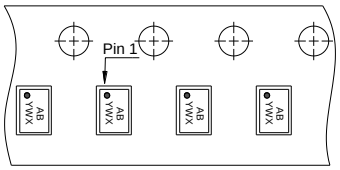
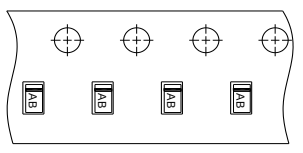
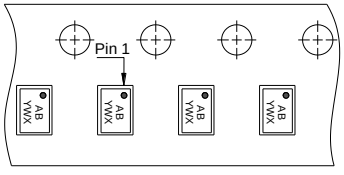
Device Tape Orientation
For Part Marking, Refer to Datasheet

8mm			8mm		
Package	**Suffix**	**Tape Orientation**	**Package**	**Suffix**	**Tape Orientation**
X3-DFN0603-2 X2-DSN0603-2	-7		X2-DFN1010-4 X2-DFN1210-6 X2-DFN1210-8	-7	
X3-DFN0603-2 X1-DFN1006-2 X2-DFN1006-2 U-DFN1006-2 Type B X3-DSN1006-3 Type B	-7B				
X2-DFN0604-3	-7B		X2-DFN1010-4	-7B	
			X2-DFN1010-6 Type UXC	-7	
X2-DFN0606-3 X2-DFN0806-3 X2-DFN0806-6 X1-DFN1006-3 X2-DFN1006-3	-7B		X2-DFN1010-6 Type UXC	-7R	
X2-DFN0808-4 X2-DFN0910-6 X2-DFN1010-6 X1-DFN1010-6 Type B X2-DFN1212-6 U-DFN2018-6	-7		X1-DFN1212-3 X1-DFN1212-3 Type B U-DFN1212-3 Type C U-DFN1212-4	-7 -13	
X2-DFN1010-4	-7R				
X1-DFN1006-2 X2-DFN1006-2	-7 -13		X2-DFN1310-6 X2-DFN1310-6 Type B	-7	
X1-DFN1006-3 X2-DFN1006-3	-7 -13		X2-DFN1409-6 X2-DFN1410-8 X2-DFN1410-6 X2-DFN1612-8 X2-DFN2010-8	-7	
X1-DFN1006-3 X2-DFN1006-3	-7R		W-DFN1114-3 X1-DFN1216-4 X2-DFN1410-4 X2-DFN2015-3 X2-DFN2015-6 W-FLGA2520-17 U-DFN2030-6 Type C	-7	

Note: a) Device tape orientation applies to all product types unless otherwise specified.
b) Tape and package drawings are not to scale and are shown for device tape orientation only.

Direction of feed

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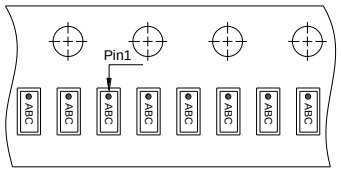
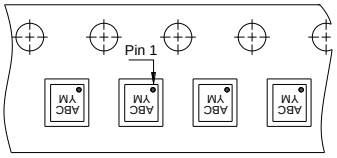
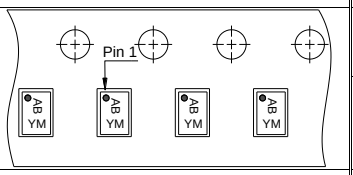
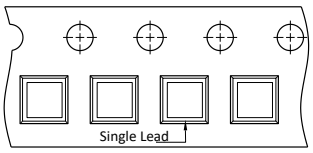
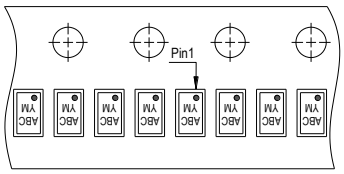
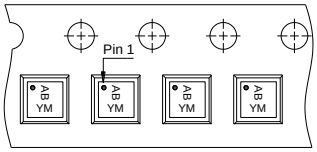
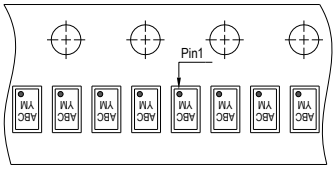
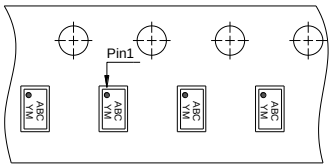
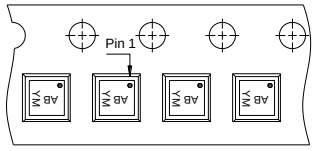
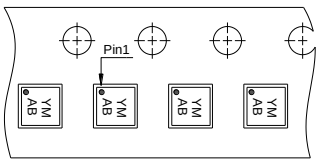
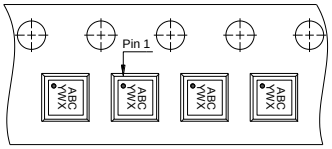
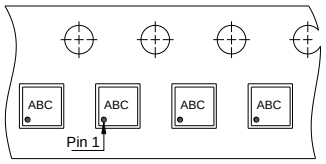
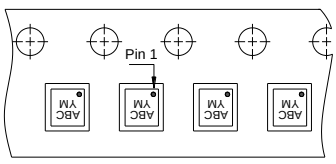
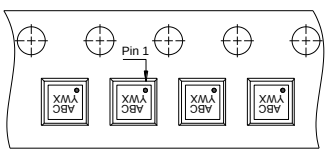
Device Tape Orientation
For Part Marking, Refer to Datasheet

8mm			8mm		
Package	**Suffix**	**Tape Orientation**	**Package**	**Suffix**	**Tape Orientation**
U-DFN1608-2 U-DFN1608-2 (Type C)	-7		U-DFN1820-6 Type A	-7	
X1-DFN1411-3	-7		U-DFN2020-3 Type B	TA -7	
			W-DFN2020-3/SWP Type A	-7 -7A	
U-DFN1610-2 Type B	-7		U-DFN2020-3 Type C U-DFN2020-6 Type E U-DFN2020-6 Type F U-DFN2523-6 X2-DFN2020-6	-7 -13	
U-DFN1610-2 Type B	-7-84		U-DFN2020-6/SWP U-DFN2020-6/SWP Type B Type F	-7	
U-DFN1610-6 X2-DFN2015-8	-7 -13		U-DFN2020-6/SWP	-7R	
X1-DFN1616-6 Type E	-7		U-DFN2020-6 Type B U-DFN2020-6 Type C U-DFN2020-6 Type S U-DFN2020-8 Type A W-DFN2020-6 Type A1 U-DFN2116-8 U-FLGA1616-8	-7	
U-DFN1616-6 Type F	-7		U-DFN2020-6/SWP Type A	-7	
			U-DFN2020-8 Type E	-7B	
U-DFN1820-6 Type A	-7		U-DFN2020-6/SWP Type A	-13R	
			W-DFN2020-6 Type A1	-7B	

Note: a) Device tape orientation applies to all product types unless otherwise specified.
b) Tape and package drawings are not to scale and are shown for device tape orientation only.

Direction of feed

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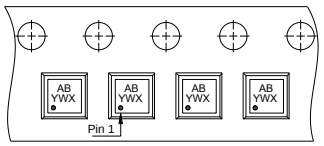
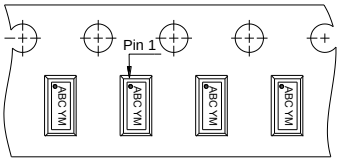
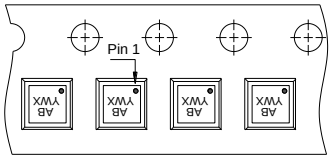
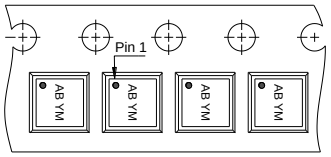
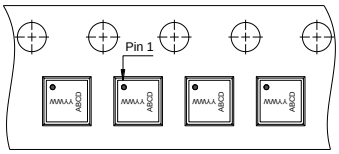
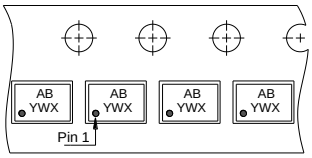
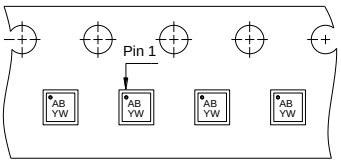
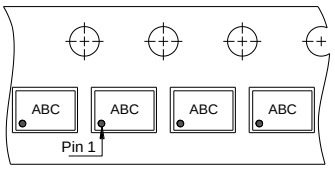
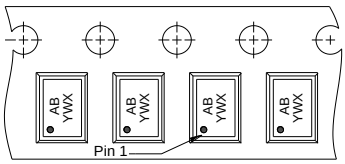
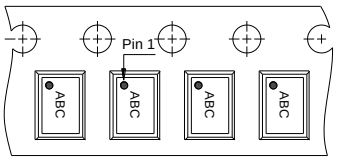
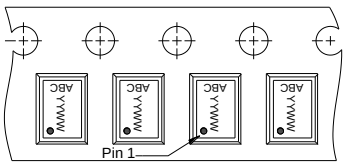
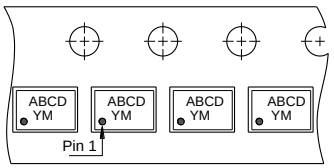
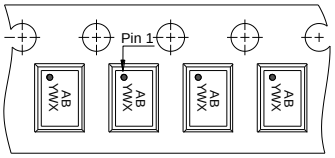
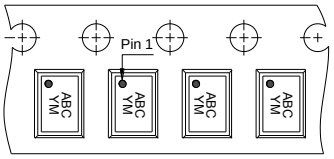
Device Tape Orientation
For Part Marking, Refer to Datasheet

8mm			8mm		
Package	**Suffix**	**Tape Orientation**	**Package**	**Suffix**	**Tape Orientation**
U-DFN2020-8 Type E U-QFN2020-9/SWP	-7		U-DFN2510-10 U-DFN3810-9 Type B X1-DFN3313-8	-7	
U-DFN2020-6 Type B U-DFN2020-6 Type C U-DFN3030-10	-7R -13R		U-DFN2626-10	-7	
V-DFN2020-8 Type F V-DFN2020-8 Type N	-7		X2-DFN3020-6	-7	
U-FLGA1515-9	--		W-DFN3020-8 Type B	TA	
X1-DFN2030-8	-7		W-DFN3020-8 Type B	-7	
U-DFN2030-6 Type B	-7 -13		V-DFN3020-8 Type K V-DFN3030-8	-7	
U-DFN2030-8 V-QFN2030-12 Type A	-7		U-DFN3020-8 Type M V-DFN3020-10	-7 -13	

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b) Tape and package drawings are not to scale and are shown for device tape orientation purpose only.

Direction of feed

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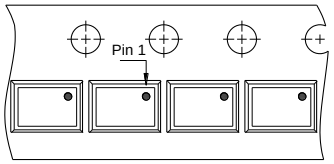
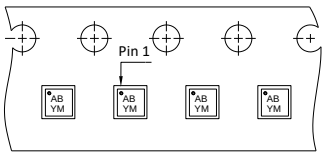
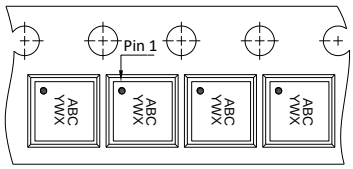
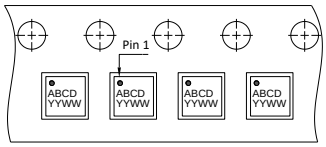
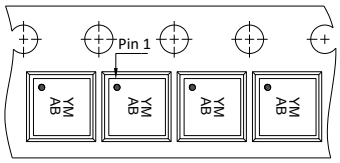
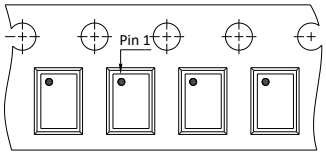
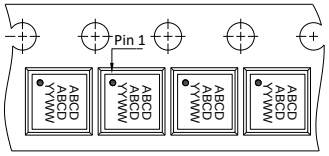
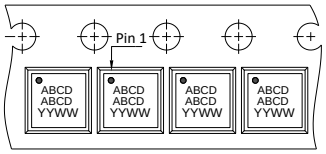
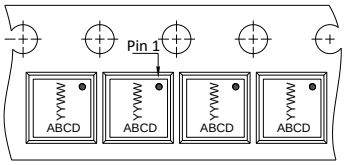
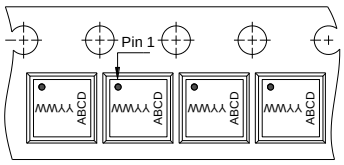
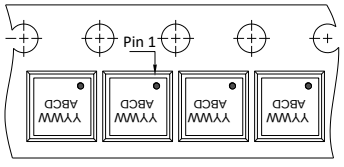
Device Tape Orientation
For Part Marking, Refer to Datasheet

8mm			8mm		
Package	**Suffix**	**Tape Orientation**	**Package**	**Suffix**	**Tape Orientation**
W-DFN3020-12 W-QFN3020-12	-7		U-QFN1515-12	-7	
V-DFN3020-14 U-DFN3030-8 Type E U-DFN3030-10 U-DFN3030-12 U-DFN3030-14 U-QFN3030-16 U-QFN3030-20	-7		U-QFN2020-12 Type B	-7	
U-DFN3030-4	-7		W-QFN2030-12	-7	
			W-QFN3020-12	-7R	
V-DFN3030-6	TC		U-QFN3030-16 Type B	TC -13	
U-DFN3030-8 U-DFN3030-8 Type B U-DFN3030-8 Type D V-DFN3030-8 Type R	-7		--	--	--
V-DFN3030-8 Type H V-DFN3030-8 Type J V-DFN3030-8 Type K V-DFN3030-8 Type M V-DFN3030-12 Type B POWERDI®3030-8	-7 -13		--	--	--
U-DFN3030-10 *Note: For Analogue Gate Drivers*	-7		--	--	--

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Direction of feed

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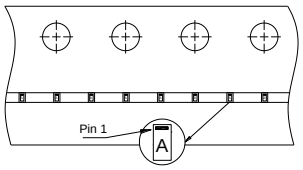
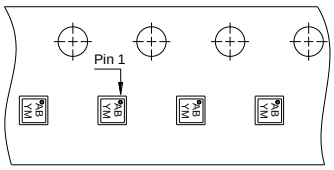
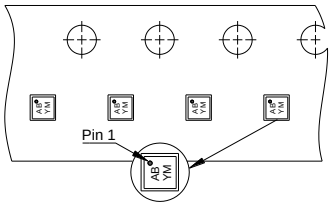
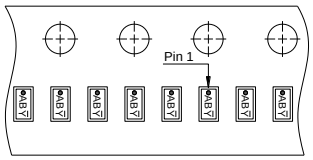
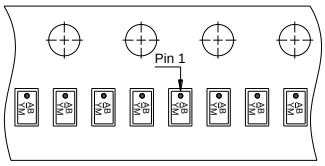
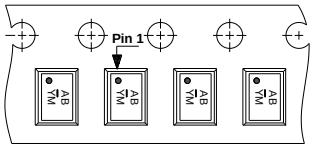
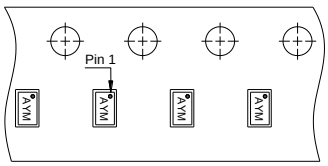
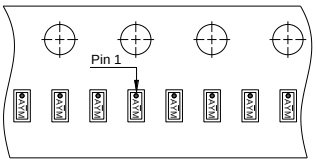
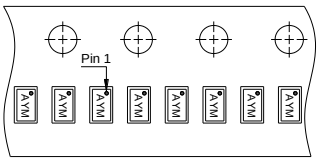
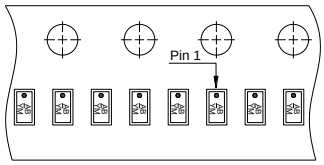
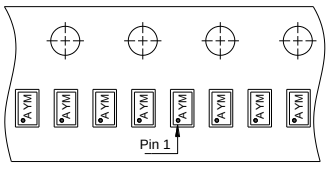
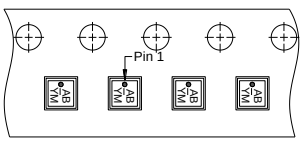
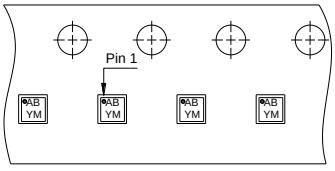
Device Tape Orientation
For Part Marking, Refer to Datasheet

8mm			8mm		
Package	**Suffix**	**Tape Orientation**	**Package**	**Suffix**	**Tape Orientation**
X4-DSN0402-2	-7		X2-DSN1010-3	-7A	
X3-DSN0808-4	-7		X3-DSN1608-2	-7B	
X3-DSN1006-2 X3-DSN1006-3	-7		X3-DSN2718-6	-7	
X2-DSN1006-3	-7		X3-TSN1406-2	-7	
X4-DSN1006-3	-7		X3-TSN1608-2	-7B	
X4-DSN1006-3	-7A		X3-TSN1616-2	-7	
X2-DSN1010-3 X3-DSN1010-3 U-WLB1010-4 U-WLB1515-9	-7		--	--	--

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Direction of feed

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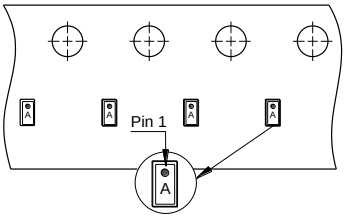
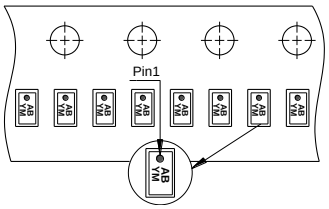
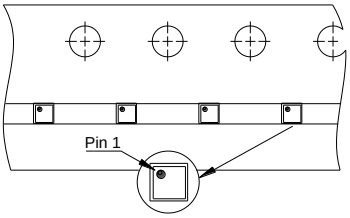
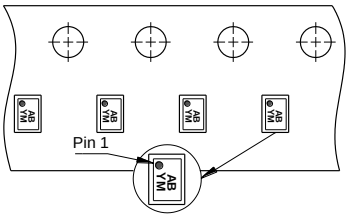
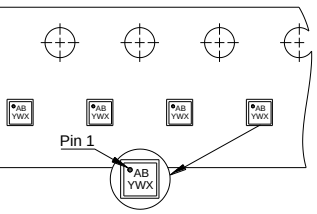
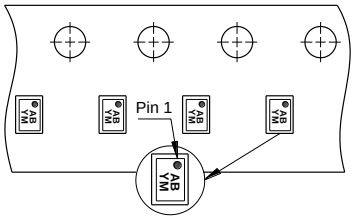
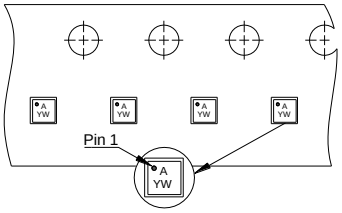
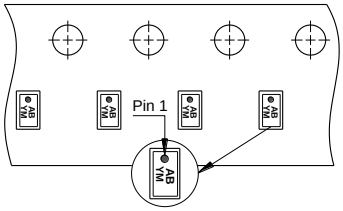
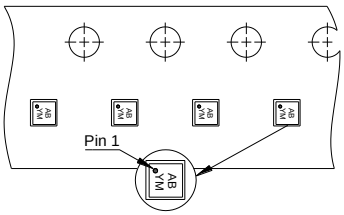
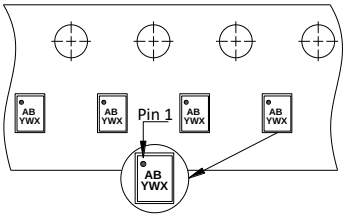
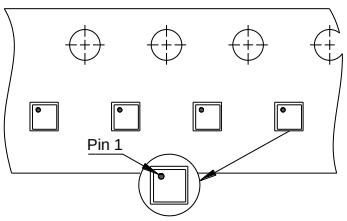
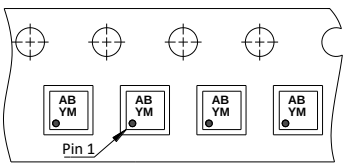
Device Tape Orientation
For Part Marking, Refer to Datasheet

8mm			8mm		
Package	**Suffix**	**Tape Orientation**	**Package**	**Suffix**	**Tape Orientation**
X3-WLB0603-2	-7		X3-WLB1006-2 X3-WLB1406-2	-7	
			X3-WLB1608-2	-7B	
X2-WLB0606-4	-7		U-WLB1510-6	-7	
U-WLB0707-4 U-WLB0808-4 W-WLB0808-4	-7		U-WLB1510-6	-7R	
X1-WLB0808-4	-7		X3-WLB1608-2 X2-WLB2010-2	-7	
X2-WLB0808-4	-7		U-WLB1713-10 U-WLB1713-12	-7	
X1-WLB0707-4 Type A1 X1-WLB0909-4	-7		X1-WLB1818-4 U-WLB1818-4	-7	

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Direction of feed

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Device Tape Orientation
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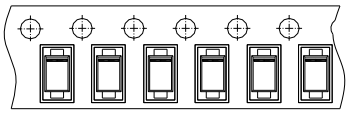
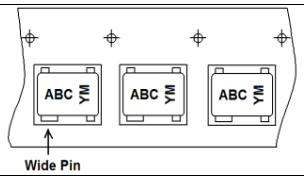
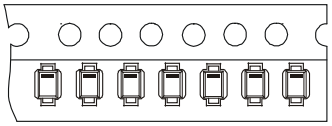
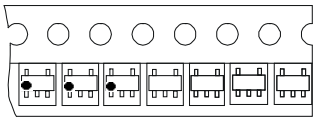
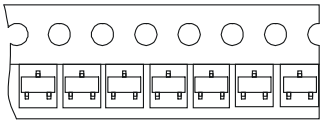
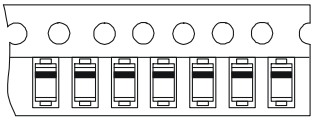
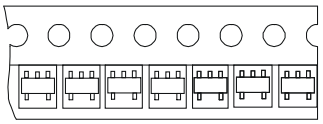
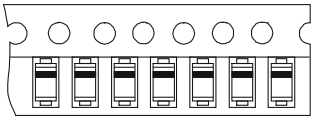
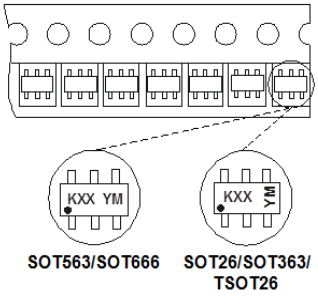
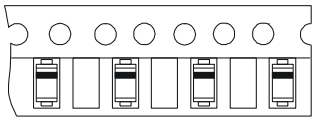
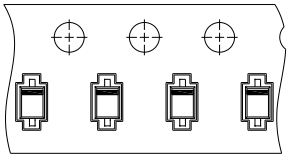
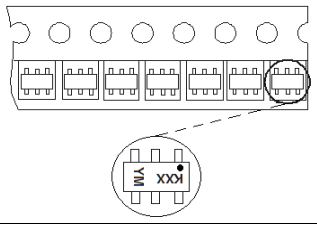
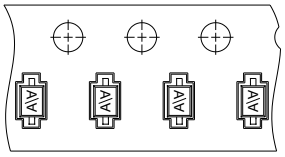
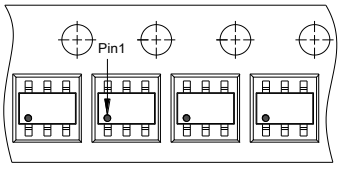
8mm			8mm		
Package	**Suffix**	**Tape Orientation**	**Package**	**Suffix**	**Tape Orientation**
DO-219AA	-7D -13D		SOT143	-7 -13	
POWERDI®123 POWERDI®123 Type B POWERDI®323 SOD323F	-7 -13		SOT25 SOT353 *Note: Analogue / Logic Only*	-7 TA	
SC59 SOT23 SOT523 SOT23F	-7 -13		SOT553 *Note: Logic Only*	-7	
SOT23 SOT23F	TA TD TC		TSOT25 *Note: Analogue Only*	-7 TA	
SOD123 SOD123F SOD923	-7 -13		SOT25 SOT353 SOT553	-7 -13	
SOD523	-13 -76 TA		SOT26 SOT363 TSOT26	TA TC	
	-7		SOT26 SOT363 SOT563 SOT666 TSOT26 (Asymmetrical)	-7 -13	
SOD323	-7 -13 TA		SOT26	TAR	
	-7	 **Note: Bi-Directional Devices**	SOT26 (Type A1)	-7	

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Direction of feed

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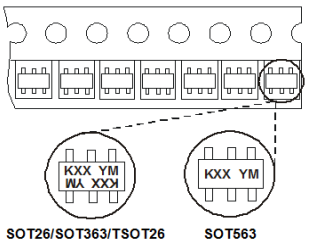
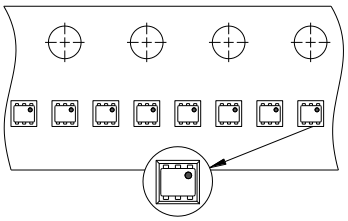
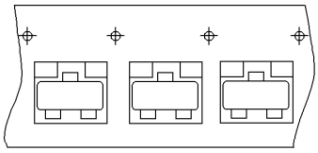
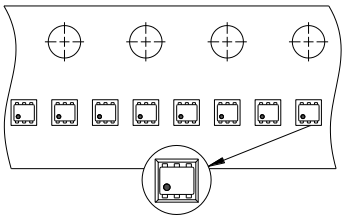
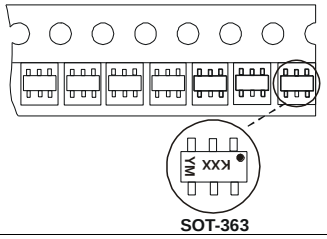
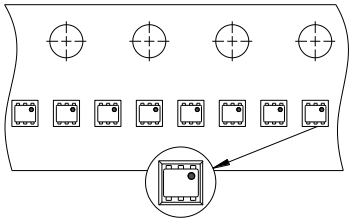
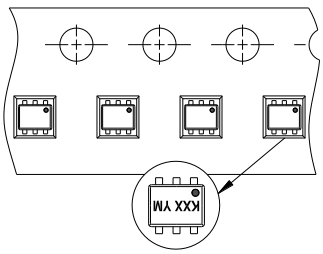
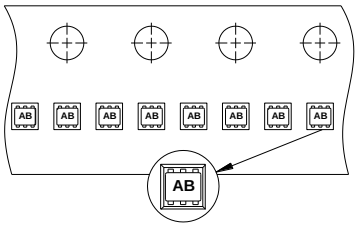
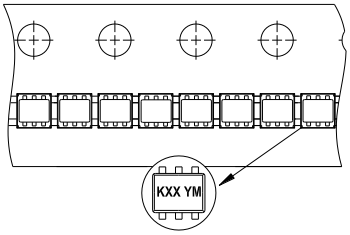
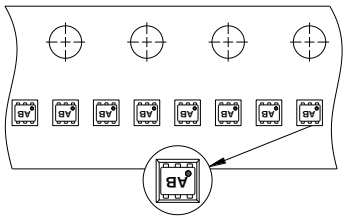
Device Tape Orientation
For Part Marking, Refer to Datasheet

8mm			8mm		
Package	**Suffix**	**Tape Orientation**	**Package**	**Suffix**	**Tape Orientation**
SOT26 SOT363 SOT563 TSOT26 (Symmetrical)	-7 -13		SOT953	-7	
SOT323	-7 -13 TA TC		SOT963 (Asymmetrical)	-7	
SOT363	-7R -13R		SOT963 (Asymmetrical)	-7B	
SOT563 (Symmetrical)	-7A -13A		SOT963 (Symmetrical)	-7	
SOT563	-7B		SOT963 (Symmetrical)	-7A	

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Direction of feed

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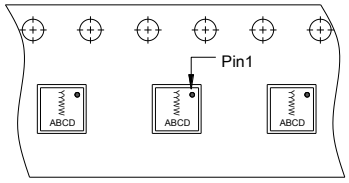
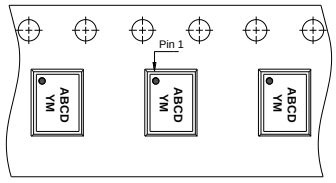
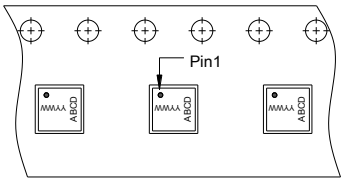
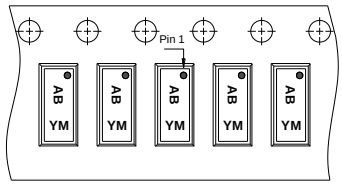
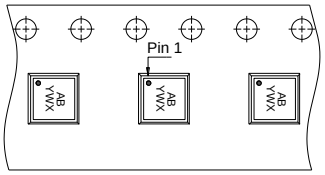
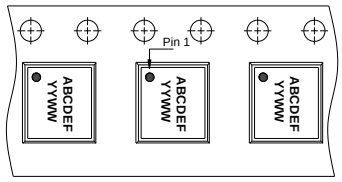
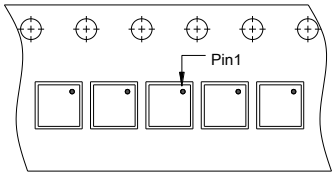
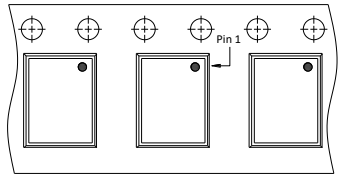
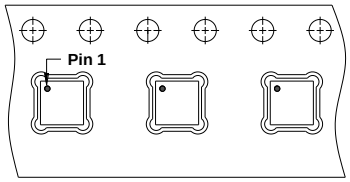
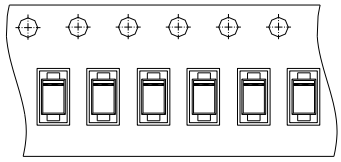
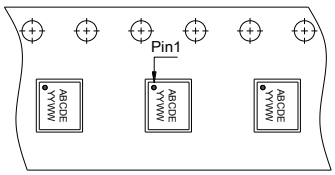
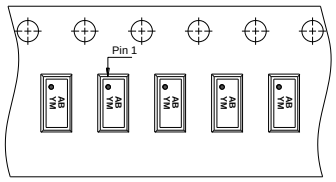
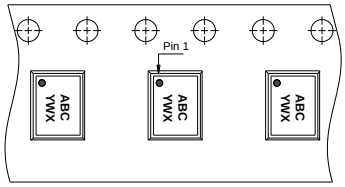
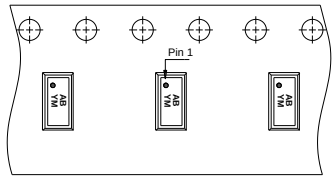
Device Tape Orientation
For Part Marking, Refer to Datasheet

12mm			12mm		
Package	**Suffix**	**Tape Orientation**	**Package**	**Suffix**	**Tape Orientation**
V-DFN3030-8 Type R	-7A -13		U-DFN4030-12 Type B U-DFN4030-12 Type C U-DFN4030-12 Type D	-13	
V-DFN3030-8 Type K V-DFN3030-12 Type B	-7A		W-DFN5020-6 V-DFN2050-4	-13	
V-DFN3333-8 Type B	-7 -13				
U-DFN3030-8 Type E	-7A		V-DFN5045-12 V-DFN5045-12 Type B V-DFN5045-12 Type C	-13	
U-DFN3030-10	-13R		W-DFN5060-4	-13	
W-DFN3030-14 Type A1	-13		DO-219AA	-7 -13	
V-DFN3035-8 U-DFN4040-8	-13		X4-DSN3415-10	-7	
U-DFN4030-12 U-DFN4030-14 U-QFN4040-16	-13		X4-DSN3415-10	-7-01	

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b) Tape and package drawings are not to scale and are shown for device tape orientation only.

Direction of feed

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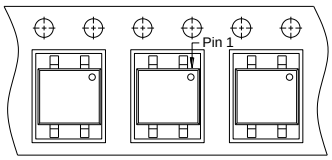
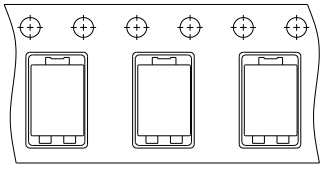
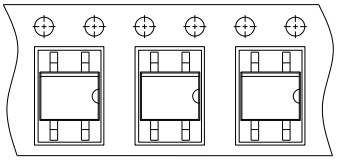
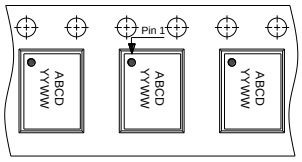
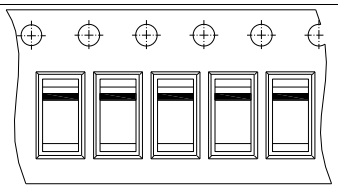
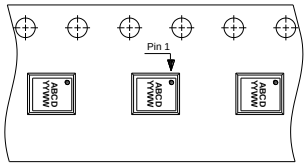
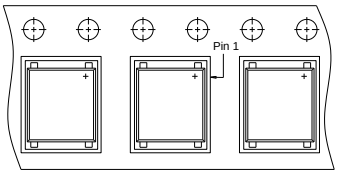
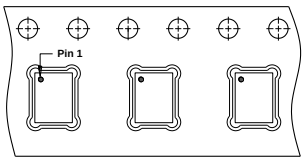
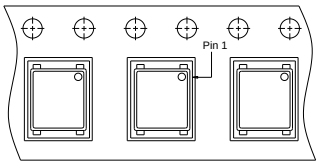
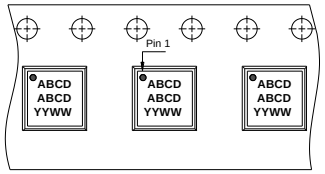
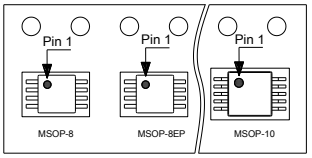
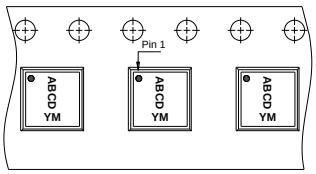
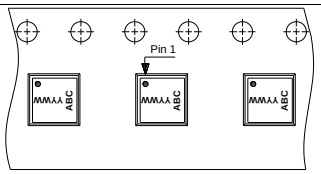
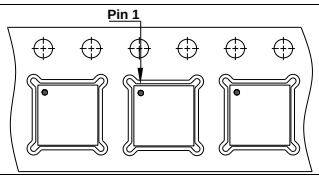
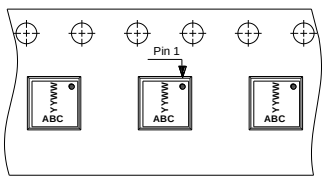
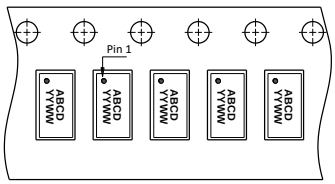
Device Tape Orientation
For Part Marking, Refer to Datasheet

12mm			12mm		
Package	**Suffix**	**Tape Orientation**	**Package**	**Suffix**	**Tape Orientation**
HDS	-13		PowerDI®5	-7D -13D	
MBS	-13		PowerDI®5060-8 PowerDI®5060-8 (Type K)	-13	
MELF	-7 -13		V-QFN3025-20 Type A	-13	
MiniDIP T-MiniDIP	-T -13		W-QFN3040-20 Type A1	-13	
MSB	-13		U-QFN4040-16 Type B U-QFN4040-20 Type B	TC	
			V-QFN4040-17	-13	
MSOP-8 MSOP-8-EP MSOP-10	-13 TA TC		U-QFN4040-16 Type C	-13	
PowerDI®3333-8 PowerDI®3333-8 (Type UX) PowerDI®3333-8 (SWP) (Type UX)	-7 -13		V-QFN4040-24 W-QFN5050-32 W-QFN5050-40	-13R	
			W-QFN4040-20 Type A1 W-QFN4040-24 Type A1	-13	
PowerDI®3333-8	-7A -13A		V-QFN4525-20	-13	

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Direction of feed

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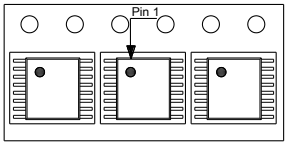
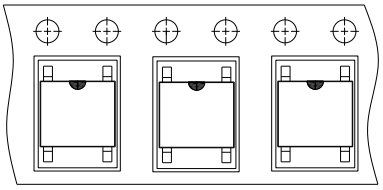
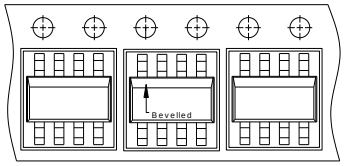
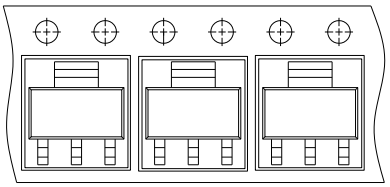
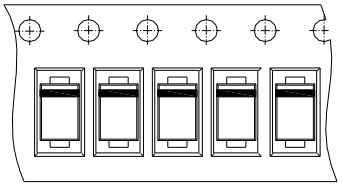
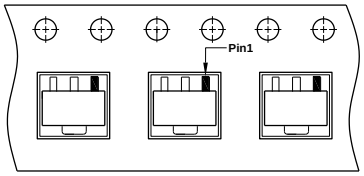
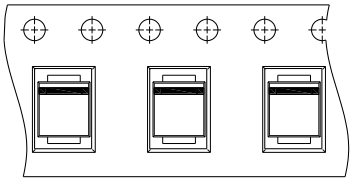
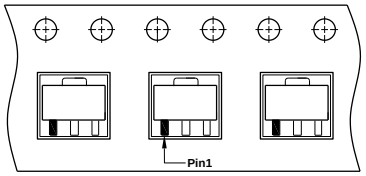
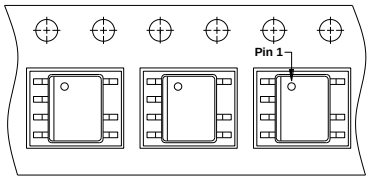
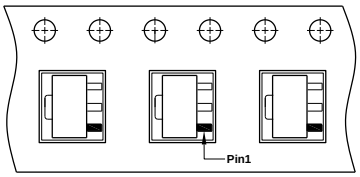
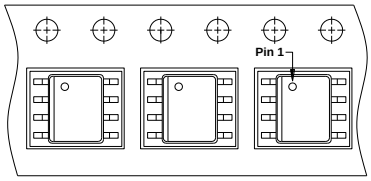
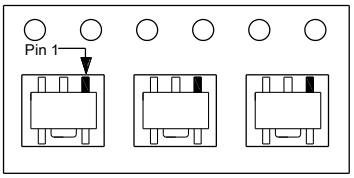
Device Tape Orientation
For Part Marking, Refer to Datasheet

12mm			12mm		
Package	**Suffix**	**Tape Orientation**	**Package**	**Suffix**	**Tape Orientation**
QSOP-16	TC		SOPA-4 SOPA-4 Type B	-13	
SM-8	TA		SOT223	-13 TA TC	
SMA SMAF SMA-FS D-FLAT	-13		SOT89-3	-7 -13	
SMB	-13		SOT89-3	-7R -13R	
			SOT89 Standard	TRG1	
SO-7	-13		SOT89-3	TA TC	
SO-8 SO-8EP	-13 TA TC		SOT89-5	-13	

Note: a) Device tape orientation applies to all product types unless otherwise specified.
b) Tape and package drawings are not to scale and are shown for device tape orientation only.

Direction of feed

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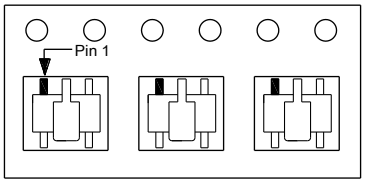
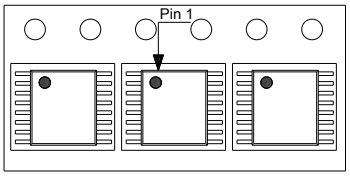
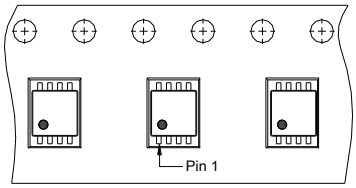
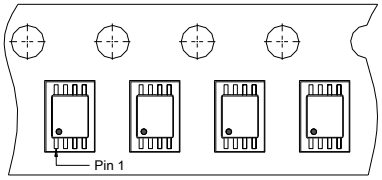
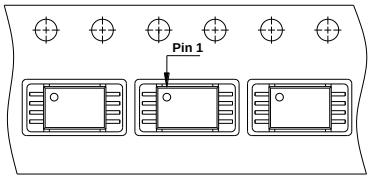
Device Tape Orientation
For Part Marking, Refer to Datasheet

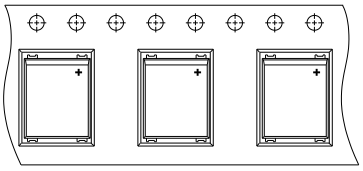
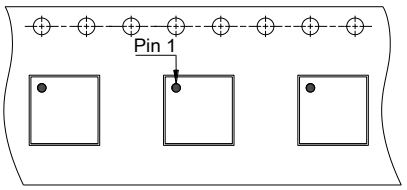
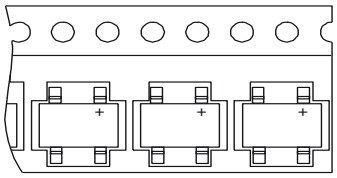
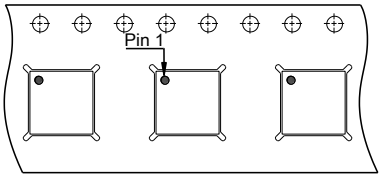
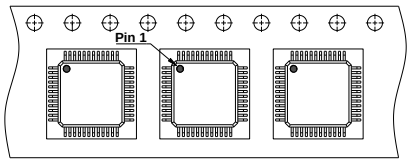
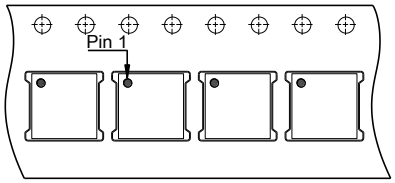
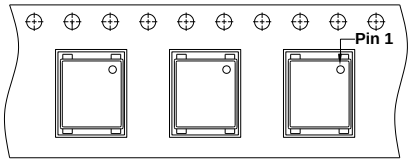
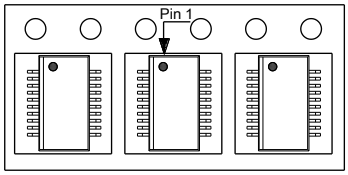
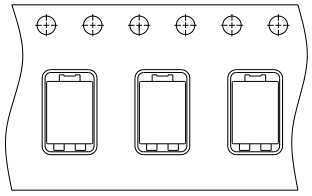
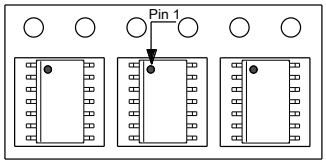
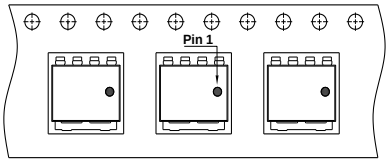
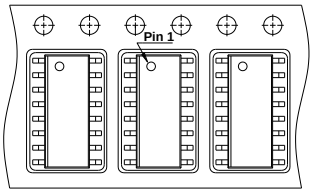
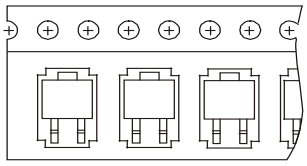
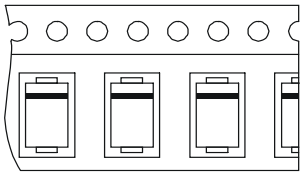
12mm			12mm		
Package	**Suffix**	**Tape Orientation**	**Package**	**Suffix**	**Tape Orientation**
SOT89-5 (Reverse)	-13		TSSOP-14 TSSOP-16 TSSOP-16EP	-13	
SSOP-8	-7		VSSOP-8	-7	
TSSOP-8	-13		--	--	--

Note: a) Device tape orientation applies to all product types unless otherwise specified.
b) Tape and package drawings are not to scale and are shown for device tape orientation only.

Direction of feed

© Diodes Incorporated

Device Tape Orientation
For Part Marking, Refer to Datasheet

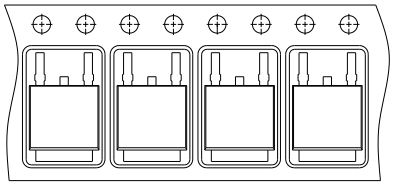
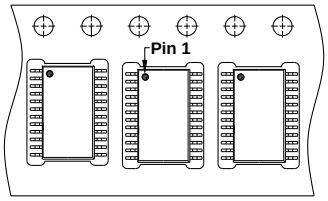
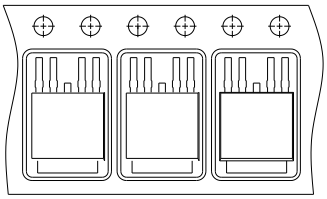
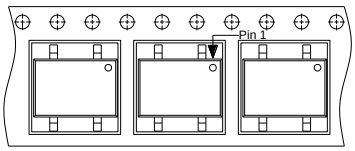
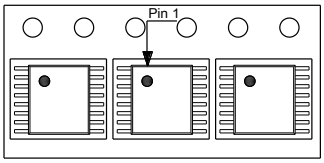
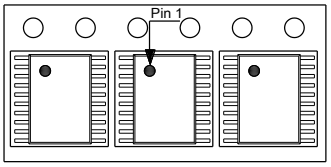
16mm			16mm		
Package	**Suffix**	**Tape Orientation**	**Package**	**Suffix**	**Tape Orientation**
DBF	-13		V-QFN6060-48	-13R	
DF-S	-T		V-QFN6060-80	-13R	
L-QFP7070-48EP	-13			-13RA	
MSBL	-13		QSOP-20	TC	
POWERDI®5	-7 -13		SO-14	-13	
PowerDI8080-5	-13		SO-16	-13	
POWERMITE®3	-7 -13		SMC	-13	

Note: a) Device tape orientation applies to all product types unless otherwise specified.
b) Tape and package drawings are not to scale and are shown for device tape orientation only.

Direction of feed

© Diodes Incorporated

Device Tape Orientation
For Part Marking, Refer to Datasheet

16mm			16mm		
Package	**Suffix**	**Tape Orientation**	**Package**	**Suffix**	**Tape Orientation**
TO252 (DPAK)	-13 TC		TSSOP-24EP	-13	
TO252-4 TO252-5	-13		TT	-13	
TSSOP-16EP	TC		--	--	--
TSSOP-20EP	TC		--	--	--

Note: a) Device tape orientation applies to all product types unless otherwise specified.
b) Tape and package drawings are not to scale and are shown for device tape orientation only.

Direction of feed

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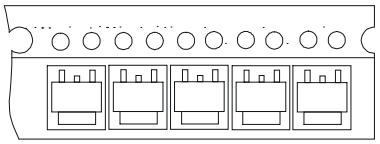
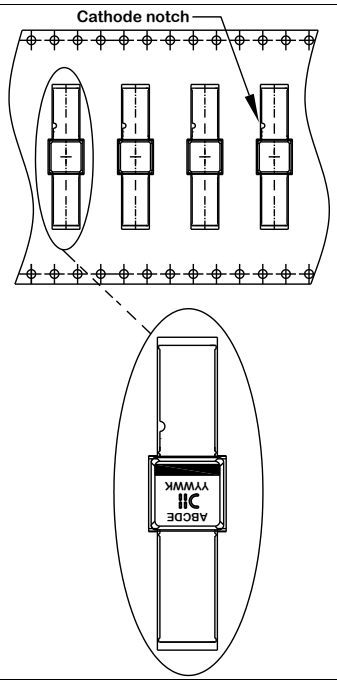
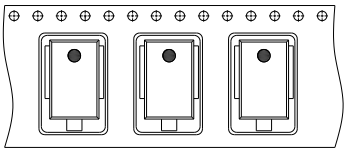
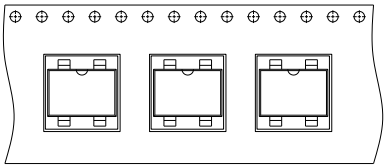
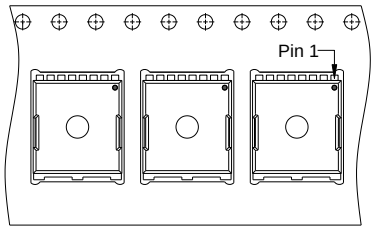
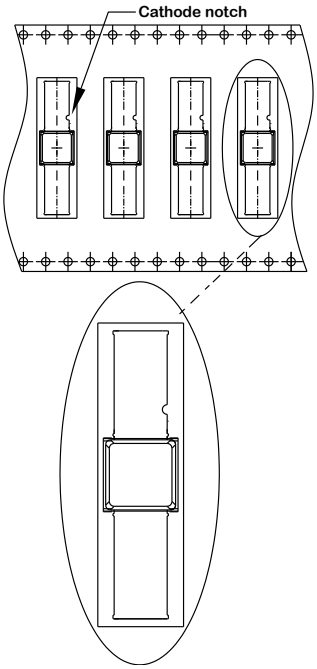
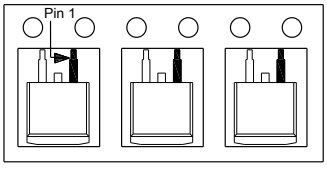
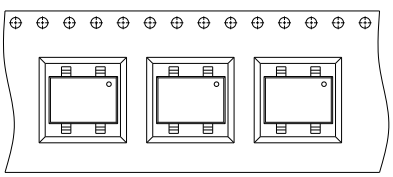
Device Tape Orientation
For Part Marking, Refer to Datasheet

24mm			40.4mm		
Package	**Suffix**	**Tape Orientation**	**Package**	**Suffix**	**Tape Orientation**
D2PAK	-T		POWERDI®5SP POWERDI®5SP-B	-13	
DO-218	-13				
HBS	-13				
PowerDI®1012-8	-13		POWERDI®5SP-B	-13R	 * Device in flipped orientation (marking code side down)
TO263AB	-13				
TTL	-13				

Note: a) Device tape orientation applies to all product types unless otherwise specified.
b) Tape and package drawings are not to scale and are shown for device tape orientation only.

Direction of feed

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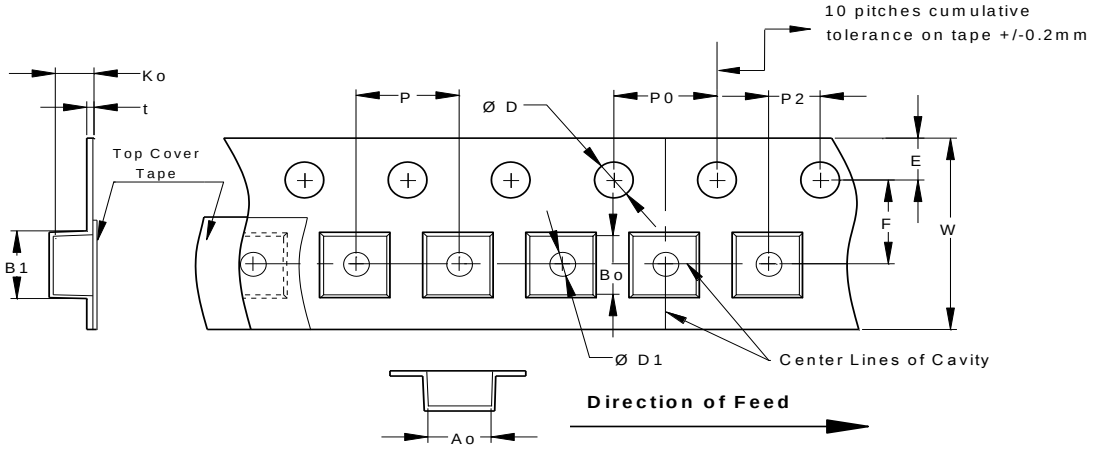
EMBOSSED CARRIER TAPE SPECIFICATIONS



8, 12, 16, 24mm EMBOSSED TAPE DIMENSIONS (in mm)						
Tape Width	**D**	**E**	**P_o**	**tmax**	**A_o B_o K_o**	
8, 12, 16, 24mm	1.50 +0.10 –0.0	1.75 ± 0.10	4.0 ± 0.10	0.400	See Note 1	**Constant Dimensions**

Tape Width	B1 max	D1 min	F	K max	P2	R min (Note 4)	W	Package Type
8mm	4.5	1.0 (Note 2) 0.35 (Note 3)	3.5 ± 0.05	2.4	2.0 ± 0.05	25	8.0 ± 0.30	Refer to 8mm Device Tape Orientation Table
12mm	8.2	1.5	5.5 ± 0.05	4.5	2.0 ± 0.05	30	12.0 ± 0.30	Refer to 12mm Device Tape Orientation Table
16mm	12.1	1.4 1.5 1.5 1.5	7.5 ± 0.10 7.5 ± 0.10 7.5 ± 0.10 7.5 ± 0.05	2.25 3.29 3.70 2.89	2.0 ± 0.10 2.0 ± 0.10 2.0 ± 0.10 2.0 ± 0.05	40	16.0 ± 0.30 16.0 ± 0.30 16.0 ± 0.30 16.0 ± 0.2	Refer to 16mm Device Tape Orientation Table
24mm	20.1	1.5	11.5 ± 0.10	6.5	2.0 ± 0.10	50	24.0 ± 0.30	Refer to 24mm Device Tape Orientation Table

P				
Tape Width	**2.0 ± 0.05**		**4.0 ± 0.10**	
	Package	**Suffix**	**Package**	**Suffix**
8mm	DFN0603, DFN0604, DFN0606 DFN0806, DFN0808 SOD923 SOT953, SOT963 WLB0603 WLB1006 WLB1406	All taping suffix	All other packages defined in the 8mm Device Tape Orientation Table	
	DFN1006 DFN1010 SOT563 WLB0808 WLB1608	-7B		
	X3-DSN1006 X4-DSN1006	-7, -7A		
	DFN1610-2 (Type B)	-7		

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P				
Tape Width	**4.0 ± 0.10**		**8.0 ± 0.10**	
12mm	**Package**	**Suffix**	**Package**	**Suffix**
	DFLAT DFN5020 MELF SMA, SMAF SMA-FS	All taping options	All other packages defined in the 12mm Device Tape Orientation Table	
	DSN3415	-7		
	QFN4525-20	-13		
P				
16mm	**8.0 ± 0.10**		**12.0 ± 0.10**	
	Package	**Suffix**	**Package**	**Suffix**
	All packages defined in the 16mm Device Tape Orientation Table except DF-S and V-QFN6060-80 (-13R)	All taping options	DF-S	-T
			V-QFN6060-80	-13R
P				
24mm	**12.0 ± 0.10**		**16.0 ± 0.10**	
	Package	**Suffix**	**Package**	
	PowerDI®1012-8	-13	D^2PAK DO-218 TO263AB	All taping options
40.40mm	POWERDI®5SP POWERDI®5SP-B	All taping options	n/a	n/a

Notes:
1. Ao Bo Ko are determined by component size. The clearance between the component and the cavity must comply to the rotational and lateral movement requirement provided in figures on page 20.
2. Applies to components 2.0mm × 1.2mm or larger.
3. Applies to components smaller than 2.0mm × 1.2mm.
4. Bending Radius , refer to page 22.

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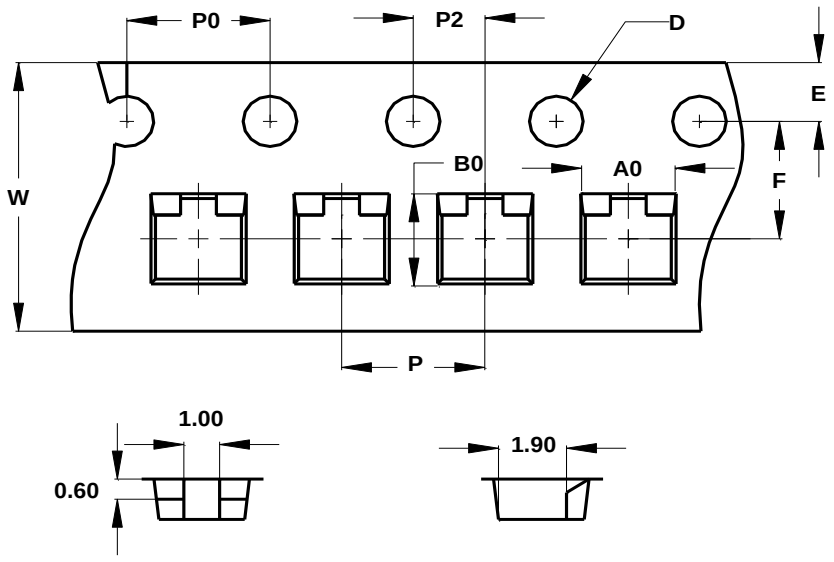
Carrier Tape Specification for SOT323



Note: P, P0, P2, D, E, F and W dimensions are the same as provided in the EMBOSSED CARRIER TAPE DIMENSIONS table.

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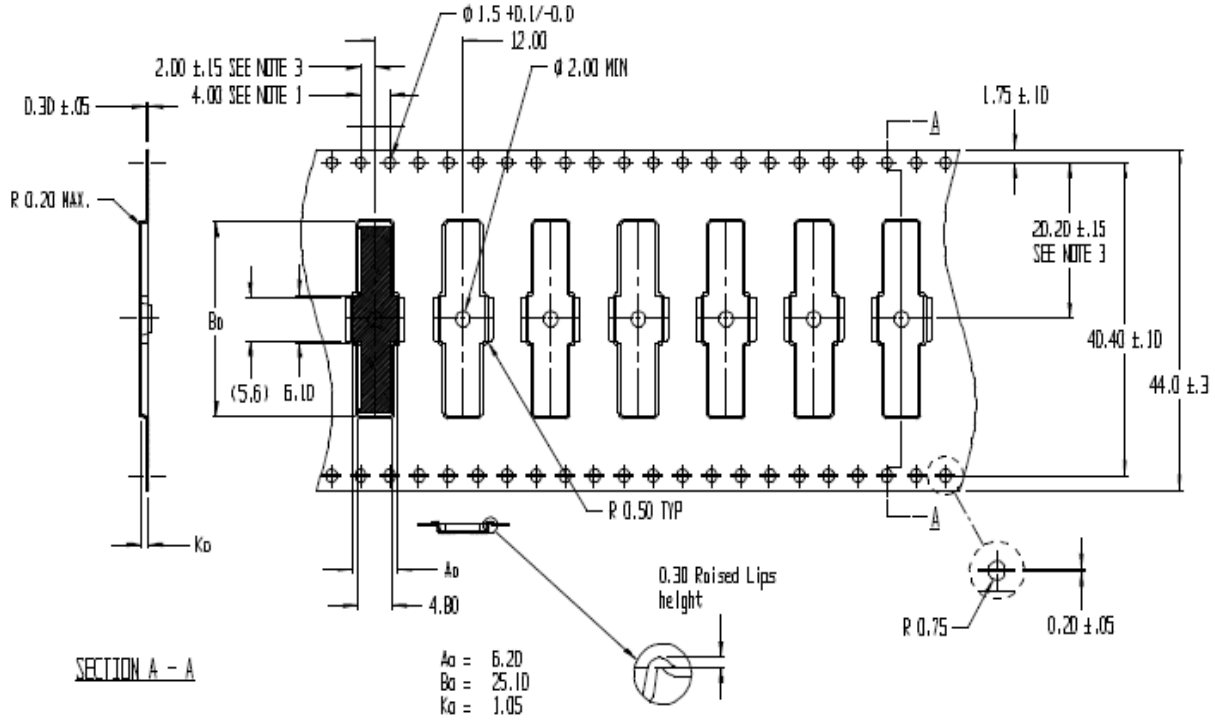
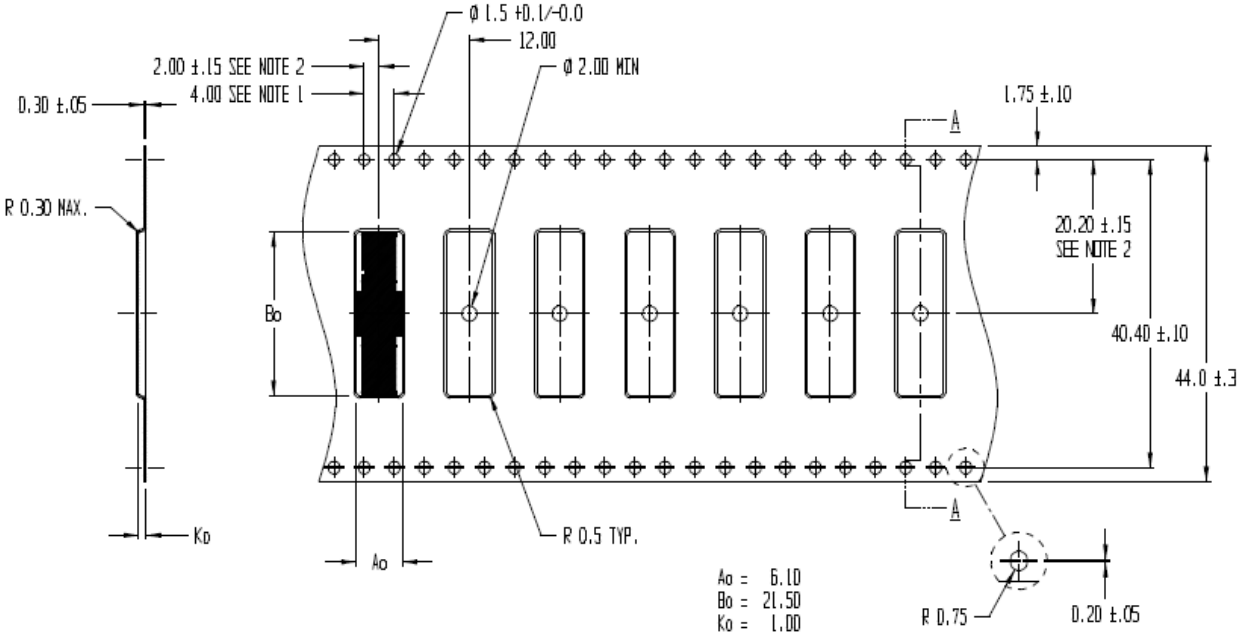
Carrier Tape Specification for POWERDI®5SP



Carrier Tape Specification for POWERDI®5SP-B



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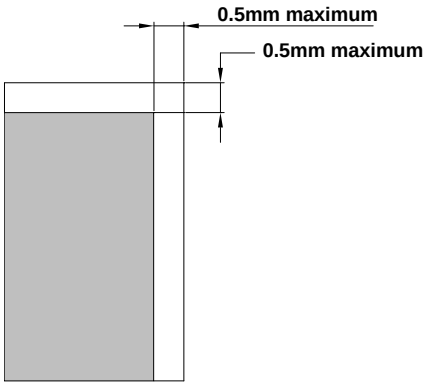
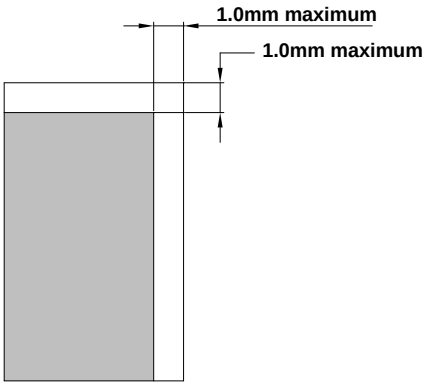
Component Lateral Movement

8mm & 12mm Tape

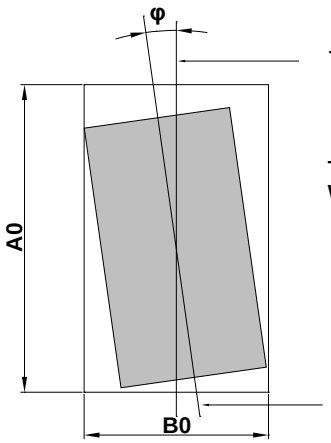


16-200mm Tape



Component Rotational Movement

Maximum Component Rotation
Top View

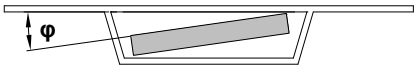


Typical Pocket Centerline

Typical Component Centerline

Tape Width (mm)	Maximum Rotation (φ)
8,12	20
16-200	10

Maximum Component Rotation
Side View



Tape Width (mm)	Maximum Rotation (φ)
8,12	20
16-56	10
72-200	5

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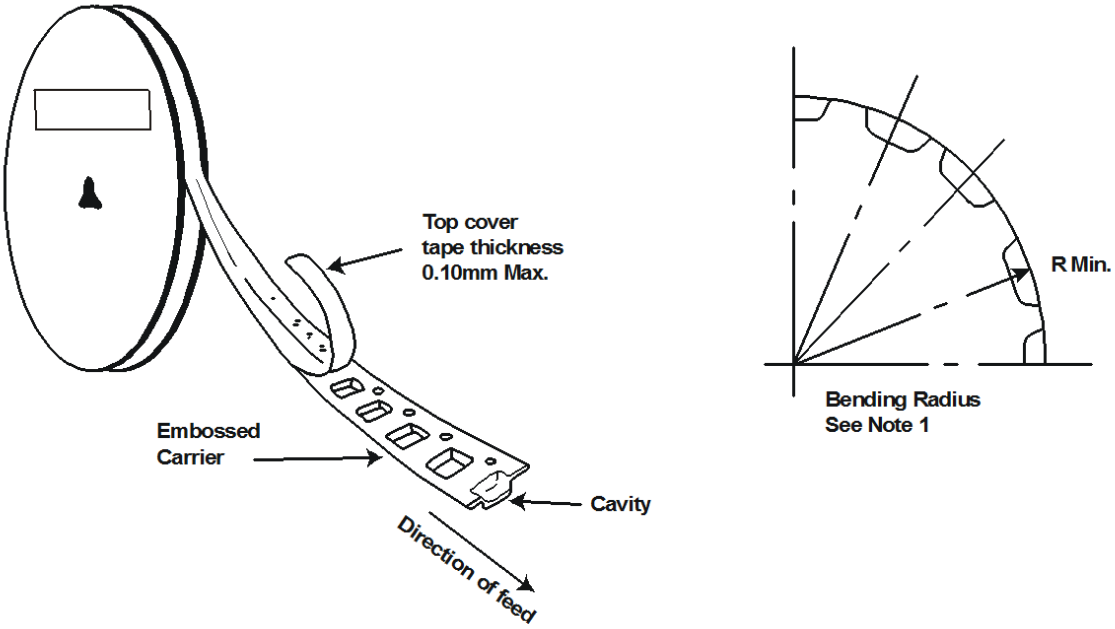

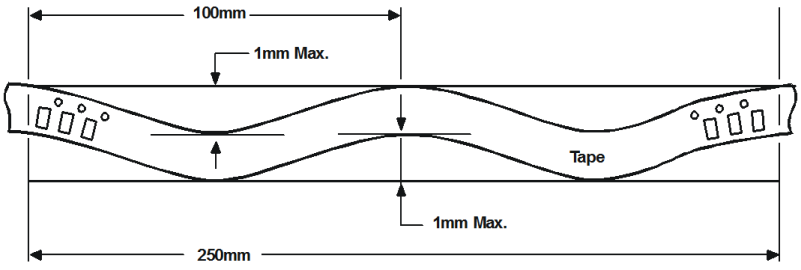

Camber (Top View)

Allowable camber to be 1.0mm/100mm non-accumulative over

Notes: 1. Tape and components shall pass around radius 'R' without damage.

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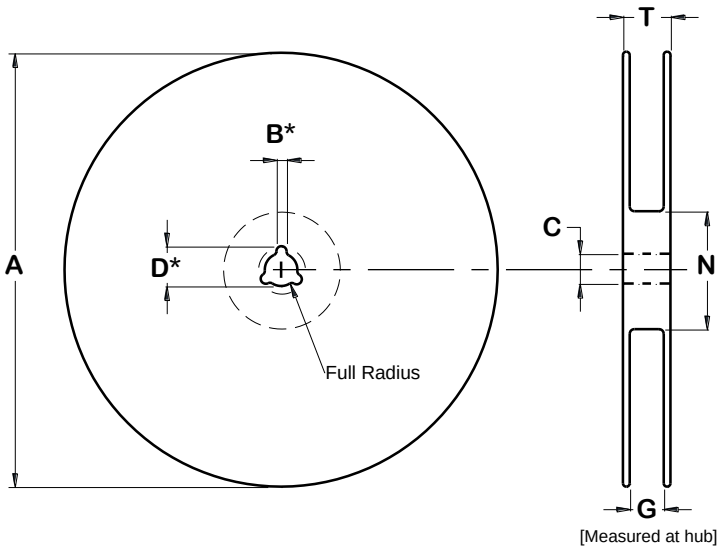
SURFACE MOUNT REEL SPECIFICATIONS
(All Dimensions in mm)



* Drive spokes optional. If used, dimensions with asterisks apply.

Tape Size	A Max	B* Max	C	D* Max	N Min	G	T Max
8mm	330 ±2	2.0 +0.5 -0	13 +0.5 -0.2	20.5 ±0.2	100 ±2	8.4 +1.5 -0.0	14.4
	178 ±2	2.0 +0.5 -0	13 +0.5 -0.2	20.5 ±0.2	55 ±5	8.4 +1.5 -0.0	14.4
12mm	330 ±2	2.0 +0.5 -0	13 +0.5 -0.2	20.5 ±0.2	100 ±2	12.4 +2.0 -0.0	18.4
	178 ±2	2.0 +0.5 -0	13 +0.5 -0.2	20.5 ±0.2	55 ±5	12.4 +2.0 -0.0	18.4
16mm	330 ±2	2.0 +0.5 -0	13 +0.5 -0.2	20.5 ±0.2	100 ±2	16.4 +2.0 -0.0	22.4
24mm	330 ±2	2.0 +0.5 -0	13 +0.5 -0.2	20.5 ±0.2	100 ±2	24.4 +2.0 -0.0	30.4

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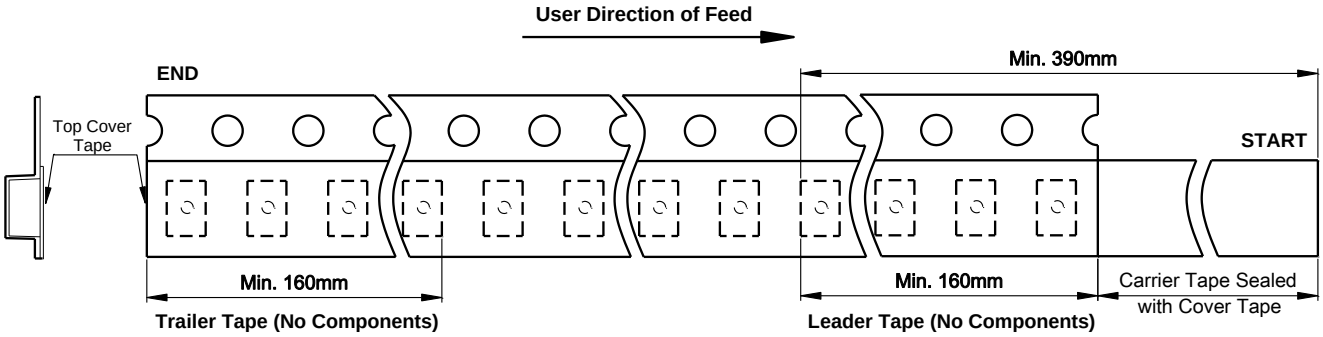
Tape Leader and Trailer



Notes:
1. There shall be a leader of 230mm [9.05 inches] minimum which may consist of carrier and/or cover tape or a start tape followed by a minimum of 160mm [6.30 inches] of empty carrier tape sealed with cover tape.
2. There shall be a trailer of 160mm [6.30 inches] minimum of empty carrier tape sealed with cover tape. The entire carrier tape must release from the reel hub as the last portion of the tape unwinds from the reel without damage to the carrier tape and the remaining components in the cavities.
3. For DO-218 package, there shall be a leader tape of 26 spaces (no components) and trailer tape of 15 spaces (no components).

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