

# Surface Mount (SMD) Packaging

## Reel and Carrier Tape Specifications

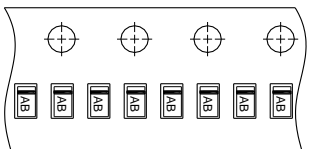
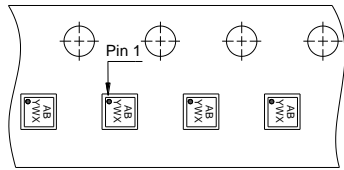
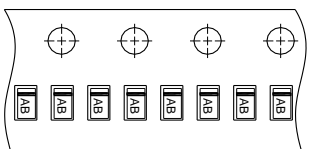
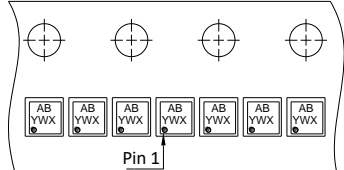
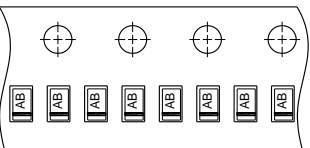
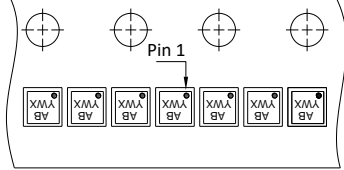
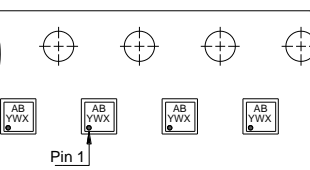
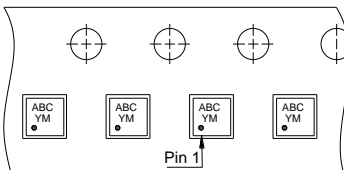
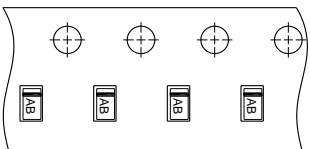
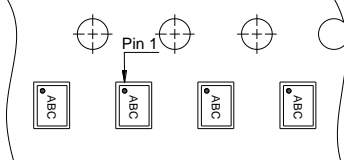
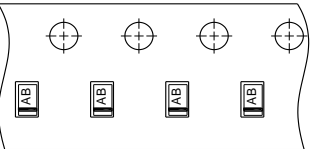
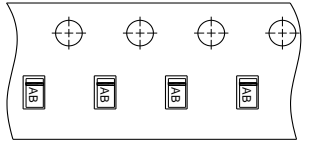
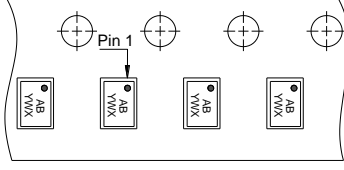
MINIMUM PACKING QUANTITY							
PACKAGE TYPE		Bulk Type Quantity	7" Tape and Reel		13" Tape and Reel		
			Quantity	Part Number Suffix	Quantity	Part Number Suffix	
DBF		NA	NA	NA	3k	-13	
DFN / QFN Series	(Notes 4, 12)	NA	3k	-7, -7R, TA, -T	10k	-13, -13R	
DFN0603		N/A	10k	-7, -7B	NA	NA	
DFN0806		NA	10k	-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, DFN1412		NA	5k	-7	NA	NA	
DFN1410-4	(Note 6)	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)	3k	-7, -7A	3k	TC, -13, -13R, -13A	
					5k	-13	
DFN3030-8 Type	(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 <sup>2</sup> PAK		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 11, 12)	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 <sup>®</sup> 5	(Note 8)	NA	1.5k	-7, -7D	5k	-13, -13D	

MINIMUM PACKING QUANTITY					
PACKAGE TYPE	Bulk Type Quantity	7" Tape and Reel		13" Tape and Reel	
		Quantity	Part Number Suffix	Quantity	Part Number Suffix
PowerDI®5SP	NA	NA	NA	3.5k	-13
PowerDI®123 , PowerMITE®3	NA	3k	-7	10k	-13
PowerDI®5SP-B	NA	NA	NA	3k	-13, -13R
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
PowerDI®5060	NA	NA	NA	2.5k	-13
PowerDI®8080-5	NA	NA	NA	2k	-13
QFN1616-12 (Type A1)	(Note 6)	NA	3.5k	-7R	NA
QFN3040	NA	NA	NA	3k	-13
QFN3535	NA	NA	NA	5k	-13
QFN4040	(Notes 5,6)	NA	1.5k	-7	4k
					-13
					5k
QFN4040-17	NA	NA	NA	2.5k	-13
QFN4040-20 (Type A1)	(Note 6)	NA	NA	3k	-13
V-QFN4040-24	(Note 6)	NA	NA	3.5k	-13R
QFN5050-32	(Note 6)	NA	NA	2.5k	-13R
QFN5050-40	(Note 6)	NA	NA	3.5k	-13R
QFN6060-48, QFN5050-80	(Note 6)	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	(Note 7)	NA	3k	-7, TA	10k
		NA	6k	-76K	NA
SOD923	NA	10k	-7	NA	NA
SO [-7, -8, -8EP]	(Note 5)	100	0.5k	TA	2.5k
					-13, TC
SO-14	(Note 5)	100	NA	NA	4k
					-13
SO-16	(Note 5)	50	NA	NA	2.5k
					-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
		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	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

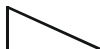
MINIMUM PACKING QUANTITY						
PACKAGE TYPE		Bulk Type Quantity	7" Tape and Reel		13" Tape and Reel	
			Quantity	Part Number Suffix	Quantity	Part Number Suffix
SOT553	(Note 9)	NA	3k	-7	NA	NA
		NA	4k	-7	NA	NA
SOT563	(Note 9)	NA	3k	-7, -7A, -7R	10k	-13, -13A
		NA	4k	-7	NA	NA
SOT963		NA	10k	-7, -7A, -7B	NA	NA
SOT953		NA	10k	-7,	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
X2-DSN1010-3		(Note 6)	NA	5k	-7, 7A	NA
X4-DSN1006-3		(Note 6)	NA	10k	-7, -7A, -7R	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. SOD523 available in 6k quantity on 7-inch reel, part number suffix "-76K".  
8. POWERDI<sup>®</sup>5 available in both 16mm and 12mm tape widths (12mm part number suffix = -7D & -13D).  
9. SOT553 / SOT563 quantity of 4k on 7-inch reel applies to Logic products.  
10. Applies to all DSN/ESN/TSN/WLB body sizes unless otherwise specified in the table.  
11. DFN/QFN/WLB/DSN/ESN/TSN/WLB quantity applies regardless of package seated height (i.e. prefix V, W, U, X1, X2, etc.) unless specified otherwise.  
12. -7x and -13x suffixes may be followed by other characters, e.g. -7-F, -13-F, etc.

## Device Tape Orientation For Part Marking, Refer to Datasheet

<b>8mm</b>			<b>8mm</b>		
Package	Suffix	Tape Orientation	Package	Suffix	Tape Orientation
X3-DFN0603-2 X2-DSN0603-2	-7	Bar Denotes Cathode Side 	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	Bar Denotes Gate & Source Side 	X2-DFN1010-4	-7B	
	-7		X2-DFN1010-6 Type UXC		
X2-DFN0606-3 X2-DFN0806-3 X2-DFN0806-6 X1-DFN1006-3 X2-DFN1006-3 U-DFN1006-3/SWP Type UX	-7B	Bar Denotes Base & Emitter Side for BJT; Gate & Source Side for MOS; Cathode Side for Diodes 	X2-DFN1010-6 Type UXC	-7R	
X2-DFN0604-3	-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	Bar Denotes Cathode Side 	X2-DFN1310-6 X2-DFN1310-6 Type B	-7	
X1-DFN1006-3 X2-DFN1006-3	-7 -13	Bar Denotes Base & Emitter Side for BJT; Gate & Source Side for MOS; Cathode Side for Diodes 		X2-DFN1409-6 X2-DFN1410-8 X2-DFN1410-6 X2-DFN1612-8 X2-DFN2010-8	-7
U-DFN1006-3/SWP Type UX	-7				
X1-DFN1006-3 X2-DFN1006-3	-7R	Bar Denotes Gate & Source Side for MOS 	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 products covered by the package unless otherwise specified.  
b) Tape and package drawings are not drawn to scale and are shown for device tape orientation only.

**Direction of feed** 

**Device Tape Orientation**  
**For Part Marking, Refer to Datasheet**

<b>8mm</b>			<b>8mm</b>		
<b>Package</b>	<b>Suffix</b>	<b>Tape Orientation</b>	<b>Package</b>	<b>Suffix</b>	<b>Tape Orientation</b>
X1-DFN1411-3	-7		X1-DFN1616-6 Type E	-7	
U-DFN1412-3/SWP Type A	-7		U-DFN1820-6 Type A	-7	
V-DFN1515-6/SWP Type UX	-7		U-DFN2020-3 Type B	TA -7	
			W-DFN2020-3/SWP Type A	-7 -7A	
U-DFN1608-2 U-DFN1608-2 Type C	-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-DFN2020-6/SWP U-DFN2020-6/SWP Type B, Type F	-7	
U-DFN1610-2 Type B	-7		U-DFN2020-6/SWP	-7R	
U-DFN1610-2 Type B	-7-84		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-DFN1610-6 X2-DFN2015-8	-7 -13		U-DFN2020-6/SWP Type A W-DFN2020-6/SWP Type UXD	-7	
			U-DFN2020-8 Type E	-7B	
X1-DFN1616-6 Type E	-7		U-DFN2020-6/SWP Type A	-13R	
			W-DFN2020-6 Type A1	-7B	

Note: a) Device tape orientation applies to all products covered by the package unless otherwise specified.  
b) Tape and package drawings are not drawn to scale and are shown for device tape orientation only.

**Direction of feed**

## Device Tape Orientation For Part Marking, Refer to Datasheet

<b>8mm</b>			<b>8mm</b>		
Package	Suffix	Tape Orientation	Package	Suffix	Tape Orientation
U-DFN2020-8 Type E U-QFN2020-9 /SWP	-7		U-DFN2626-10	-7	
U-DFN2020-6 Type B U-DFN2020-6 Type C U-DFN3030-10	-7R -13R		X2-DFN3020-6 V-DFN3020-8 Type K V-DFN3030-8	-7	
U-DFN2020-6/SWP Type UXC	-7R		W-DFN3020-8 Type B	TA	
V-DFN2020-8 Type C	-7				
U-QFN2020-12 Type UX	-T		W-DFN3020-12 W-QFN3020-12	-7	
W-QFN2020-12 (Type US)	--				
V-DFN2020-8 Type F V-DFN2020-8 Type N	-7		W-DFN3020-8 Type B	-7	
X1-DFN2030-8	-7		U-DFN3020-8 Type M V-DFN3020-10	-7 -13	
U-DFN2030-6 Type B	-7 -13		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-DFN2030-8 V-QFN2030-12 Type A	-7		U-DFN3030-4	-7	
U-DFN2510-10 X1-DFN3313-8	-7		V-DFN3030-6	TC	

Note: a) Device tape orientation applies to all products covered by the package unless otherwise specified.  
b) Tape and package drawings are not drawn to scale and are shown for device tape orientation purpose only.

**Direction of feed**

## Device Tape Orientation For Part Marking, Refer to Datasheet

<b>8mm</b>			<b>8mm</b>		
Package	Suffix	Tape Orientation	Package	Suffix	Tape Orientation
U-DFN3030-8 U-DFN3030-8 Type B U-DFN3030-8 Type D V-DFN3030-8 Type R	-7		U-QFN1515-12	-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		W-QFN1520-8/SWP Type UX W-QFN1520-10 U-QFN1720-12 Type CJ	-7	
U-DFN3030-10 <i>Note: For Analogue Gate Drivers</i>	-7		X2-QFN1616-12 Type A1	-7R	
U-DFN3810-9 Type B	-7		U-QFN2020-10	-7	
U-FLGA1515-9	--		U-QFN2020-12 Type B	-7	
X1-QFN1012-8 Type AX	-7		W-QFN2030-12	-7	
			W-QFN3020-12	-7R	
U-QFN1520-10	-7R -13R		U-QFN3030-16 Type B	TC -13	
--	--	--	V-QFN3030-8	-7	

Note: a) Device tape orientation applies to all products covered by the package unless otherwise specified.  
b) Tape and package drawings are not drawn to scale and are shown for device tape orientation only.

**Direction of feed**

**Device Tape Orientation  
For Part Marking, Refer to Datasheet**

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

Note: a) Device tape orientation applies to all products covered by the package unless otherwise specified.  
b) Tape and package drawings are not drawn to scale and are shown for device tape orientation only.

**Direction of feed**



**Device Tape Orientation  
For Part Marking, Refer to Datasheet**

<b>8mm</b>			<b>8mm</b>		
<b>Package</b>	<b>Suffix</b>	<b>Tape Orientation</b>	<b>Package</b>	<b>Suffix</b>	<b>Tape Orientation</b>
X3-DSN0603-2 X3-WLB0603-2	-7		U-WLB1510-6	-7R	
X2-WLB0606-4 X1-WLB0808-4 U-WLB0808-4 Type B	-7		X3-WLB1608-2 X2-WLB2010-2	-7	
U-WLB0707-4 U-WLB0808-4 W-WLB0808-4	-7		U-WLB1713-10 U-WLB1713-12	-7	
X2-WLB0808-4	-7		X1-WLB1818-4 U-WLB1818-4	-7	
X1-WLB0707-4 Type A1 X1-WLB0909-4 X1-WLB1012-6	-7		W-WLB2013-12	-7	
X3-DSN1406-2 X3-WLB1006-2 X3-WLB1406-2	-7		W-WLB2118-20		
X3-DSN1608-2 X3-WLB1608-2	-7B				
U-WLB1510-6	-7		U-WLB2626-36	-7	

Note: a) Device tape orientation applies to all products covered by the package unless otherwise specified.  
b) Tape and package drawings are not drawn to scale and are shown for device tape orientation only.

**Direction of feed**

## Device Tape Orientation For Part Marking, Refer to Datasheet

<u>8mm</u>			<u>8mm</u>		
Package	Suffix	Tape Orientation	Package	Suffix	Tape Orientation
DO-219AA	-7D -13D		SOT25 SOT353 SOT553	-7 -13	
POWERDI®123 POWERDI®123 Type B POWERDI®323 SOD323F	-7 -13		SOT25 SOT353	-7 TA	
SC59 SOT23 SOT523 SOT23F	-7 -13		SOT553	-7	
SOT23 SOT23F	TA TD TC		TSOT25	-7 TA	
SOD123 SOD123F SOD923	-7 -13		SOT26 SOT363 TSOT26	TA TC	
SOD523	-76K		SOT26 SOT363 TSOT26 (Asymmetrical)	-7 -13	
	-7 TA -13		SOT26	TAR	
SOD323	-7 -13 TA		SOT363	-7R -13R	
	-7		SOT26 (Type A1)	-7	
			SOT26 SOT363 TSOT26 (Symmetrical)	-7 -13	
SOT143	-7 -13				

Note: a) Device tape orientation applies to all products covered by the package unless otherwise specified.  
b) Tape and package drawings are not drawn to scale and are shown for device tape orientation only.

Direction of feed

**Device Tape Orientation  
For Part Marking, Refer to Datasheet**

<b>8mm</b>			<b>8mm</b>			
<b>Package</b>	<b>Suffix</b>	<b>Tape Orientation</b>	<b>Package</b>	<b>Suffix</b>	<b>Tape Orientation</b>	
SOT323	-7 -13 TA TC		SOT953	-7		
SOT563 (Symmetrical)	-7 -13		SOT963 (Symmetrical)	-7		
	-7A -13A			-7A -7B		
	-7B		SOT963 (Asymmetrical)	-7		
SOT563 (Asymmetrical)	-7 -13		--	--	-7B	
	-7R				--	--

Note: a) Device tape orientation applies to all products covered by the package unless otherwise specified.  
b) Tape and package drawings are not drawn to scale and are shown for device tape orientation only.

**Direction of feed**

**Device Tape Orientation  
For Part Marking, Refer to Datasheet**

<u>12mm</u>			<u>12mm</u>		
Package	Suffix	Tape Orientation	Package	Suffix	Tape Orientation
V-DFN3030-8 Type R	-7A -13		U-DFN4030-12 U-DFN4030-14 U-QFN4040-16	-13	
V-DFN3030-8/SWP Type UX U-DFN3030-8 Type E	-13A		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 -13		V-DFN5045-12 V-DFN5045-12 Type B V-DFN5045-12 Type C	-13	
V-DFN3020-13/SWP Type A1 V-DFN3030-8/SWP Type A	-7				
U-DFN3030-10	-13R		W-DFN5060-4	-13	
W-DFN3030-14 Type A1	-13		X4-DSN3415-10	-7	
V-DFN3035-8 U-DFN4040-8	-13		X4-DSN3415-10	-7-01	

Note: a) Device tape orientation applies to all products covered by the package unless otherwise specified.  
b) Tape and package drawings are not drawn to scale and are shown for device tape orientation only.

**Direction of feed**

## Device Tape Orientation For Part Marking, Refer to Datasheet

<u>12mm</u>			<u>12mm</u>		
Package	Suffix	Tape Orientation	Package	Suffix	Tape Orientation
DO-219AA	-7 -13		PowerDI®3333-8	-7A -13A	
HDS	-13		PowerDI®5	-7D -13D	
MBS	-13		PowerDI®5060-8 PowerDI®5060-8/SWP (All Types)	-13	
MELF	-7 -13		V-QFN3025-20 Type A V-QFN3535-14 Type CJ	-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	

Note: a) Device tape orientation applies to all products covered by the package unless otherwise specified.  
b) Tape and package drawings are not drawn to scale and are shown for device tape orientation only.

**Direction of feed**

**Device Tape Orientation**  
**For Part Marking, Refer to Datasheet**

<b>12mm</b>			<b>12mm</b>		
<b>Package</b>	<b>Suffix</b>	<b>Tape Orientation</b>	<b>Package</b>	<b>Suffix</b>	<b>Tape Orientation</b>
V-QFN4525-20	-13		SOPA-4 SOPA-4 Type B	-13	
QSOP-16	TC		SOT223	-13 TA TC	
SM-8	TA		SOT89-3	-7 -13	
SMA SMAF SMA-FS D-FLAT	-13		SOT89-3	-7R -13R	
			SOT89 Standard	TRG1	
SMB	-13		SOT89-3	TA TC	
SO-7	-13		SOT89-5	-13	
SO-8 SO-8EP	-13 TA TC		SOT89-5 (Reverse)	-13	

Note: a) Device tape orientation applies to all products covered by the package unless otherwise specified.  
b) Tape and package drawings are not drawn to scale and are shown for device tape orientation only.

**Direction of feed**

**Device Tape Orientation  
For Part Marking, Refer to Datasheet**

<b>12mm</b>			<b>12mm</b>		
<b>Package</b>	<b>Suffix</b>	<b>Tape Orientation</b>	<b>Package</b>	<b>Suffix</b>	<b>Tape Orientation</b>
SSOP-8	-7		TSSOP-14 TSSOP-16 TSSOP-16EP	-13	
TSSOP-8	-13		VSSOP-8	-7	
--	--	--	--	--	--

Note: a) Device tape orientation applies to all products covered by the package unless otherwise specified.  
b) Tape and package drawings are not drawn to scale and are shown for device tape orientation only.

**Direction of feed**

**Device Tape Orientation  
For Part Marking, Refer to Datasheet**

<b>16mm</b>			<b>16mm</b>		
<b>Package</b>	<b>Suffix</b>	<b>Tape Orientation</b>	<b>Package</b>	<b>Suffix</b>	<b>Tape Orientation</b>
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 products covered by the package unless otherwise specified.  
b) Tape and package drawings are not drawn to scale and are shown for device tape orientation only.

**Direction of feed**



**Device Tape Orientation  
For Part Marking, Refer to Datasheet**

<b>16mm</b>			<b>16mm</b>		
<b>Package</b>	<b>Suffix</b>	<b>Tape Orientation</b>	<b>Package</b>	<b>Suffix</b>	<b>Tape Orientation</b>
TO252 (DPAK)	-13 TC		TSSOP-20	-13	
			TSSOP-20EP	TC	
TO252-4 TO252-5	-13		TSSOP-24EP TSSOP-24EP (Type A1-B)	-13	
TSSOP-16EP	TC		TT	-13	

Note: a) Device tape orientation applies to all products covered by the package unless otherwise specified.  
b) Tape and package drawings are not drawn to scale and are shown for device tape orientation only.

**Direction of feed**

**Device Tape Orientation  
For Part Marking, Refer to Datasheet**

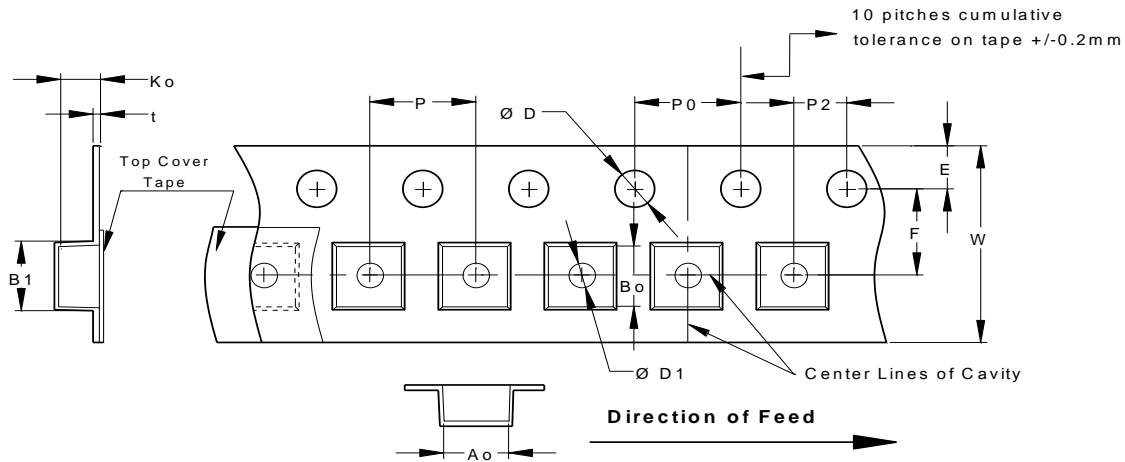
<b>24mm</b>			<b>40.4mm</b>		
<b>Package</b>	<b>Suffix</b>	<b>Tape Orientation</b>	<b>Package</b>	<b>Suffix</b>	<b>Tape Orientation</b>
D2PAK	-T				
DO-218	-13		POWERDI®5SP POWERDI®5SP-B	-13	
HBS	-13				
PowerDI®1012-8	-13				
TO263AB	-13		POWERDI®5SP-B	-13R	
TTL	-13				

\* Device in flipped orientation (marking code side down)

Note: a) Device tape orientation applies to all products covered by the package unless otherwise specified.  
b) Tape and package drawings are not drawn to scale and are shown for device tape orientation only.

**Direction of feed**

## EMBOSSED CARRIER TAPE SPECIFICATIONS



8, 12, 16, 24mm EMBOSSED TAPE DIMENSIONS (in mm)						
Tape Width	D	E	P <sub>0</sub>	t <sub>max</sub>	A <sub>0</sub> B <sub>0</sub> K <sub>0</sub>	Constant Dimensions
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

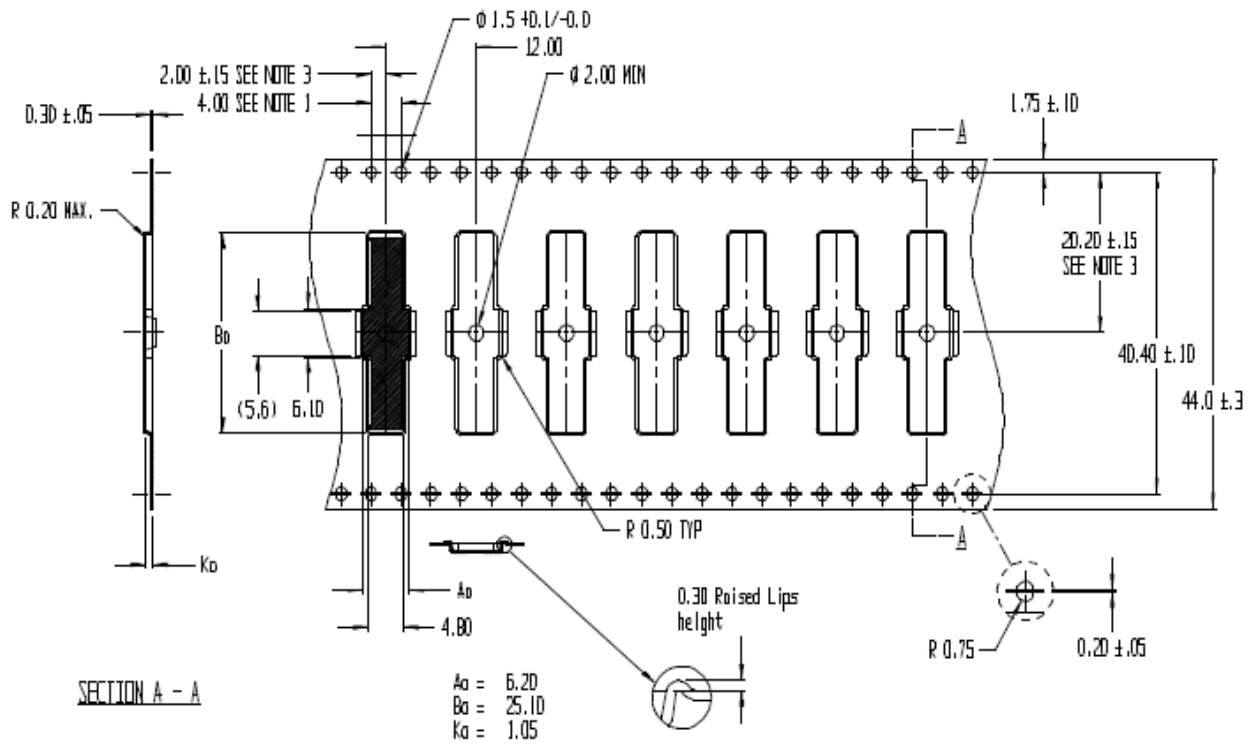
Tape Width	B <sub>1</sub> max	D <sub>1</sub> min	F	K max	P <sub>2</sub>	R min (Note 4)	W	Package Type
8mm	4.5	1.0 (Note 2) 0.35 (Note 3)	3.5 ± 0.05	2.4	2.0 ± 0.05	25	8.0 ± 0.30	Refer to 8mm Device Tape Orientation Table
12mm	8.2	1.5	5.5 ± 0.05	4.5	2.0 ± 0.05	30	12.0 ± 0.30	Refer to 12mm Device Tape Orientation Table
16mm	12.1	1.4	7.5 ± 0.10	2.25	2.0 ± 0.10	40	16.0 ± 0.30	Refer to 16mm Device Tape Orientation Table
		1.5	7.5 ± 0.10	3.29	2.0 ± 0.10		16.0 ± 0.30	
		1.5	7.5 ± 0.10	3.70	2.0 ± 0.10		16.0 ± 0.30	
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 DSN0603, WLB0603 WLB1006 DSN1406, WLB1406	All taping suffix	All other packages defined in the 8mm Device Tape Orientation Table	
	DFN1006 DFN1010 SOT563 WLB0808 DSN1608, WLB1608	-7B		
	X3-DSN1006 X4-DSN1006	-7, -7A		
	DFN1610-2 (Type B)	-7		

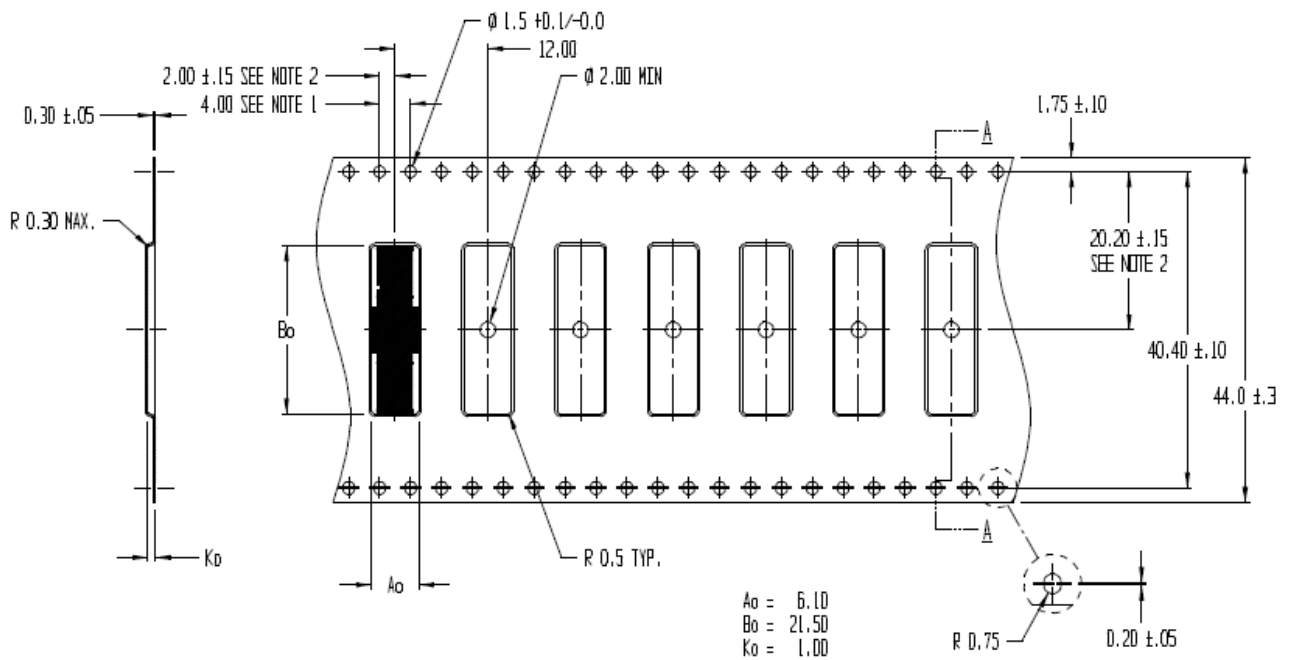
P				
Tape Width	4.0 ± 0.10		8.0 ± 0.10	
12mm	Package	Suffix	Package	Suffix
	DFLAT DFN5020 MELF SMA, SMAF SMA-FS DSN3415	All taping options	All other packages defined in the 12mm Device Tape Orientation Table	
		-7		
QFN4525-20	-13			
P				
16mm	8.0 ± 0.10		12.0 ± 0.10	
	Package	Suffix	Package	Suffix
	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	Suffix
	PowerDI®1012-8	-13	D <sup>2</sup> PAK 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 the component size. The clearance between the component and the cavity must comply with the rotational and lateral movement requirement provided on page 22.
  2. Applies to components 2.0mm x 1.2mm or larger.
  3. Applies to components smaller than 2.0mm x 1.2mm.
  4. Bending Radius , refer to page 23.

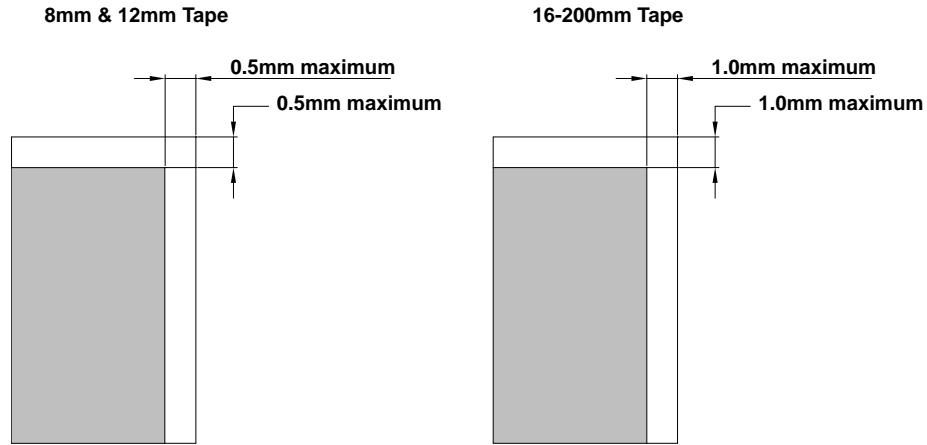
**Carrier Tape Specification for POWERDI®5SP**



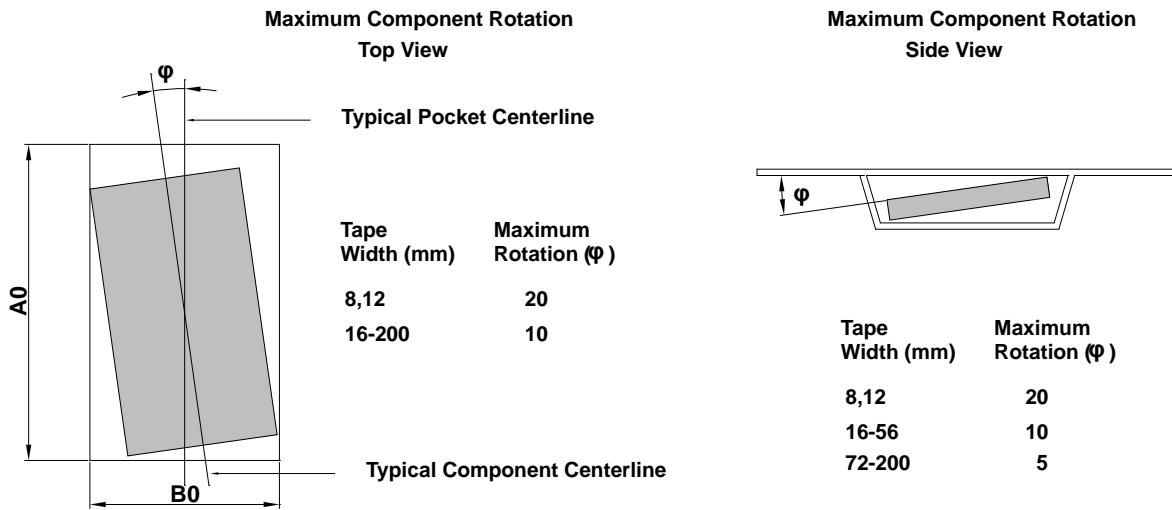
**Carrier Tape Specification for POWERDI®5SP-B**

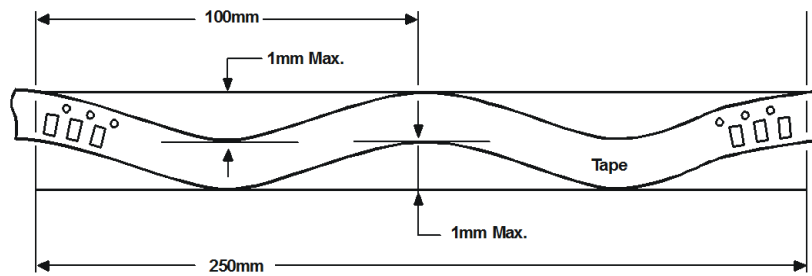
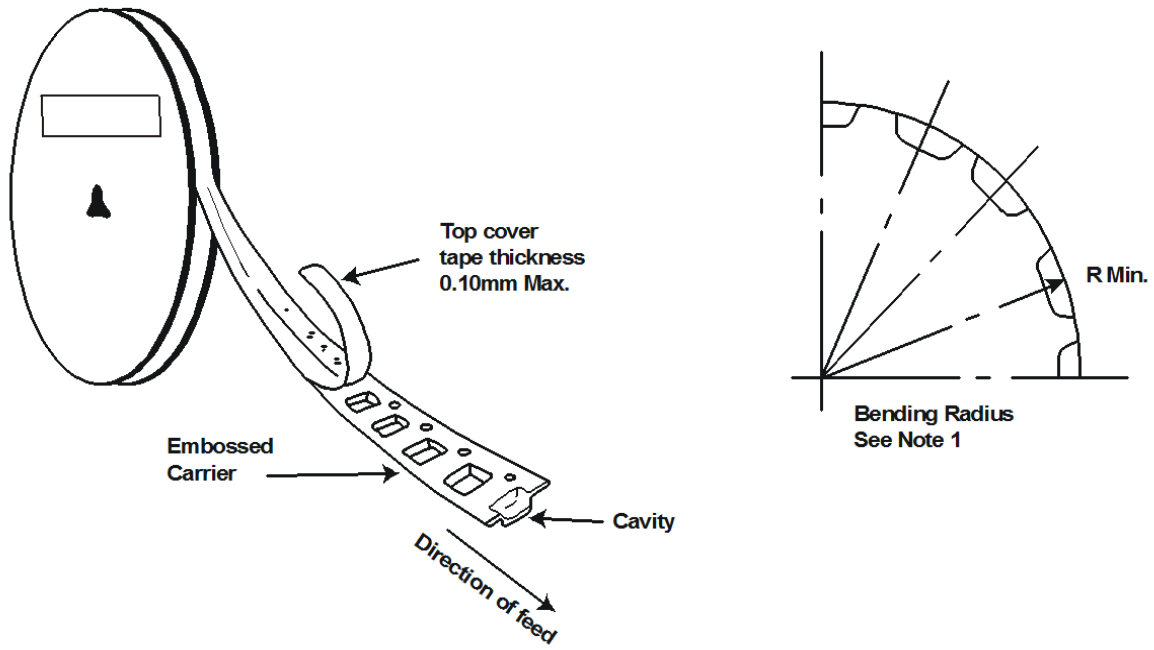


## Component Lateral Movement



## Component Rotational Movement



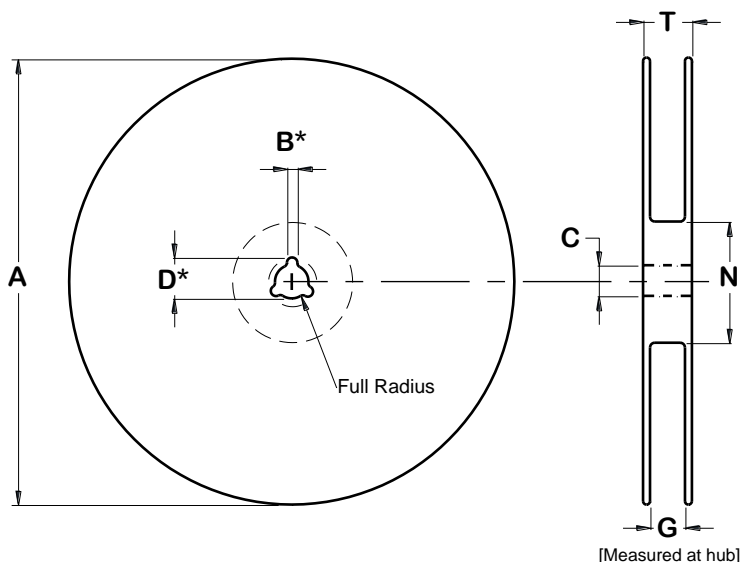


Camber (Top View)

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

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

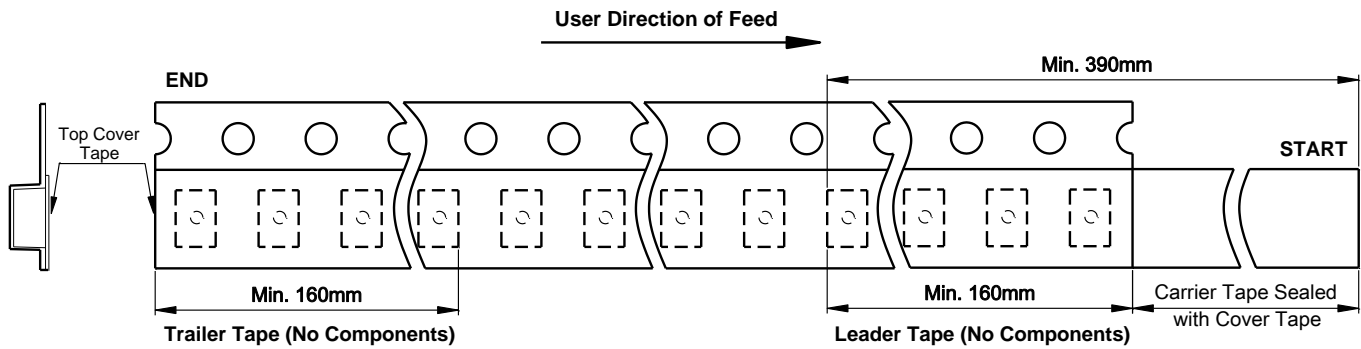
## SURFACE MOUNT REEL SPECIFICATIONS (All Dimensions in mm)



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



## 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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