

SPECIFICATION SHEET NO.	S0618- P6SMB51AL0S51A	
ORIGINAL MFG/PART NO.	 LGE Diodes/P6SMB51A-L	
NEXTGEN PART CODE	P6SMB51AL0S51A	Indicate This Code For RFQ /Order
DATE	Jun. 18, 2025	
REVISION	A4	Updated With Most Recent Data
DESCRIPTION AND MAIN PARAMETRICS	SMD Transient Voltage Suppressor (TVs) Diodes, P6SMB Series Case SMB/DO-214AA, 2 Pads, Unidirectional Type, Breakdown Voltage 51V, Peak Pulse Power: 600 Watts, Reverse Surge Current: 8.56A Max. Operating Junction Temp. Range -55°C ~+150°C Package in Tape/Reel, 3000pcs/Reel RoHS/RoHS III compliant, RoHS Annex III lead Exemption (Exempt per RoHS EU 2015/863) and Halogen Free (HF)	
CUSTOMER		
CUSTOMER PART NUMBER		
CROSS REF. PART NUMBER		
MEMO		

VENDOR APPROVE			
Issued/Checked/Approved			
Effective Date: Jun. 18, 2025			

CUSTOMER APPROVE	
Date:	

MAIN FEATURE

- Glass Passivated Chip
- 600W Peak Pulse Power Capability With a 10/1000 μ s Waveform, Repetitive Rate (Duty Cycle):0.01 %
- Uni-Directional and Bi-directional Polarity Option
- Low Leakage
- Excellent Clamping Capability
- Very Fast Response Time
- Short Lead Time
- Cross Competitors Parts and More.
- RoHS/RoHS III compliant, RoHS Annex III lead Exemption (Exempt per RoHS EU 2015/863) and Halogen Free (HF)



*Image shown is a representation only.
Exact specifications should be obtained
from the product dimension.*



APPLICATION

- I/O Interface
- AC/DC Power Supply
- Low Frequency Signal Transmission Line (RS232, RS485, etc.)

ELECTRICAL CHARACTERISTICS

- See Page 5 ~Page 11 For Different Part Code
- All Parameters are Subject To NextGen Components' Final Confirmation

HOW TO ORDER

- Please Follow Up Part Code Guide And Indicate NextGen Part Code P6SMB51AL0S51A For RFQ and Order.

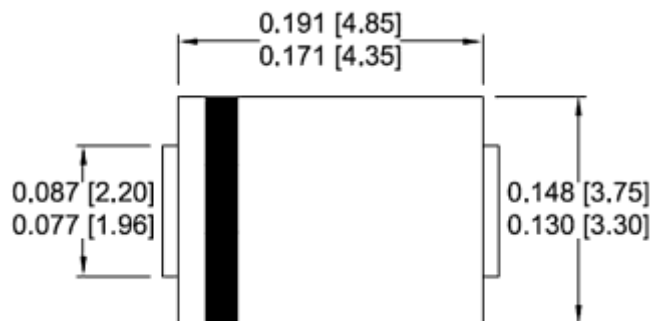
PART CODE GUIDE

RFQ
[Request For Quotation](#)

CODE	NAME	KEY SPECIFICATION OPTION
P6SMB	Product Series Code	SMD Transient Voltage Suppressors (TVs) Diodes, Case SMB/DO-214AA, 2 Pads
51A	Mode code	51A: Breakdown Voltage 51V, Uni-directional Polarity Type, Reverse Surge Current: 8.56A Max.
L0S	Internal Control Code	Letter or Digits (A~Z, a~z or 0~9)
51A	Marking Code	Marking "51A"
XX	Special/Custom Parameters Code	Letter or Digits (A~Z, a~z or 0~9) for Special Parametric; Blank: N/A

DIMENSION- Unit: Inch [mm], Case SMB/DO-214AA Outline

Top View



Side View



Recommend Pad Layout



SYMBOL	A	B	C	D	E
Unit (Inch)	0.11	0.094	0.181	0.086	0.276
Unit (mm)	2.80	2.40	4.60	2.20	7.00

MECHANICAL DATA

CASE	EXPOXY	LEAD	POLARITY	MOUNTING POSITION	MARKING
JEDEC SMB/DO-214AA Molded Plastic Body	UL 94V-0 Rate Flame Retardant	Solderable per MIL-STD 750, Method 2026	Color Band Denotes Cathode End Except Bipolar	Any	See Marking Code List

MAX. RATING & CHARACTERISTICS - Ratings at 25°C ambient temperature unless otherwise specified.

PARAMETER	SYMBOLS	VALUE	UNITS
Peak Power Dissipation with 10/1000μs Waveform See Note 1	P _{pp}	600	W
Peak Pulse Current with a 10/1000μs waveform See Note 1	I _{pp}	See Page 6~ Page 11	A
Power Dissipation On Infinite Heatsink at T _L = 75 °C	P _D	5.0	W
Peak Forward Surge Current 8.3ms Single Half Sine- Wave Unidirectional Type Only See Note 2	I _{FSM}	100	A
Maximum instantaneous forward voltage at 25A for Unidirectional Type Only See Note 3	V _F	3.5/5.0	V
Operating Junction And Storage Temperature Range	T _J , T _{STG}	-55 ~ +150	°C

Note

1. Non-repetitive Current Pulse Per Fig.5 And Derated Above T_A= 25 °C Per Fig.1
2. Measured On 8.3 ms Single Half Sine-wave Or Equivalent Square Wave, Duty Cycle = 4 Pulses Per Minute Max.
3. V_F<3.5V for devices of V_{BR}<200V and V_F<5.0V for devices of V_{BR}>201V

UNIDIRECTIONAL TYPE- ELECTRICAL CHARACTERISTICS - Ta = 25°C

Part Code	Working Peak Reverse Voltage	Breakdown Voltage		Test Current	Max. Reverse Leakage	Max. Reverse Surge Current	Max. Clamping Voltage	Marking Code
		VBR @ IT						
	VRWM	Min.	Max.	IT	IR @ VRWM	IPP	Vc @ IPP	
	V	V	V	mA	µA	A	V	
P6SMB6V8AL6V8A	5.8	6.46	7.14	10	1000	57.14	10.5	6V8A
P6SMB7V5AL7V5A	6.4	7.13	7.88	10	500	53.1	11.3	7V5A
P6SMB8V2AL8V2A	7.0	7.79	8.61	10	200	49.59	12.1	8V2A
P6SMB9V1AL9V1A	7.8	8.65	9.56	1	50	44.78	13.4	9V1A
P6SMB10AL0S10A	8.6	9.5	10.5	1	10	41.38	14.5	10A
P6SMB11AL0S11A	9.4	10.45	11.55	1	5	38.46	15.6	11A
P6SMB12AL0S12A	10.2	11.4	12.6	1	5	35.93	16.7	12A
P6SMB13AL0S13A	11.1	12.35	13.65	1	1	32.97	18.2	13A
P6SMB15AL0S15A	12.8	14.25	15.75	1	1	28.3	21.2	15A
P6SMB16AL0S16A	13.6	15.2	16.8	1	1	26.67	22.5	16A
P6SMB18AL0S18A	15.3	17.1	18.9	1	1	23.81	25.2	18A
P6SMB20AL0S20A	17.1	19	21	1	1	21.66	27.7	20A
P6SMB22AL0S22A	18.8	20.9	23.1	1	1	19.61	30.6	22A
P6SMB24AL0S24A	20.5	22.8	25.2	1	1	18.07	33.2	24A
P6SMB27AL0S27A	23.1	25.65	28.35	1	1	16.0	37.5	27A
P6SMB30AL0S30A	25.6	28.5	31.5	1	1	14.49	41.4	30A
P6SMB33AL0S33A	28.2	31.35	34.65	1	1	13.13	45.7	33A
P6SMB36AL0S36A	30.8	34.2	37.8	1	1	12.02	49.9	36A
P6SMB39AL0S39A	33.3	37.05	40.95	1	1	11.13	53.9	39A
P6SMB43AL0S43A	36.8	40.85	45.15	1	1	10.12	59.3	43A

UNIDIRECTIONAL TYPE- ELECTRICAL CHARACTERISTICS - Ta = 25°C

Part Code	Working Peak Reverse Voltage	Breakdown Voltage		Test Current	Max. Reverse Leakage	Max. Reverse Surge Current	Max. Clamping Voltage	Marking Code
		VBR @ IT						
	VRWM	Min.	Max.	IT	IR @ VRWM	IPP	VC @ IPP	
	V	V	V	mA	µA	A	V	
P6SMB47AL0S47A	40.2	44.65	49.35	1	1	9.26	64.8	47A
P6SMB51AL0S51A	43.6	48.45	53.55	1	1	8.56	70.1	51A
P6SMB56AL0S56A	47.8	53.2	58.8	1	1	7.79	77	56A
P6SMB62AL0S62A	53	58.9	65.1	1	1	7.06	85	62A
P6SMB68AL0S68A	58.1	64.6	71.4	1	1	6.52	92	68A
P6SMB75AL0S75A	64.1	71.25	78.75	1	1	5.83	103	75A
P6SMB82AL0S82A	70.1	77.9	86.1	1	1	5.31	113	82A
P6SMB91AL0S91A	77.8	86.45	95.55	1	1	4.8	125	91A
P6SMB100AL100A	85.5	95	105	1	1	4.38	137	100A
P6SMB110AL110A	94	104.5	115.5	1	1	3.95	152	110A
P6SMB120AL120A	102	114	126	1	1	3.64	165	120A
P6SMB130AL130A	111	123.5	136.5	1	1	3.35	179	130A
P6SMB150AL150A	128	142.5	157.5	1	1	2.9	207	150A
P6SMB160AL160A	136	152	168	1	1	2.74	219	160A
P6SMB170AL170A	145	161.5	178.5	1	1	2.56	234	170A
P6SMB180AL180A	154	171	189	1	1	2.44	246	180A
P6SMB200AL200A	171	190	210	1	1	2.19	274	200A
P6SMB220AL220A	185	209	231	1	1	1.83	328	220A
P6SMB250AL250A	214	237.5	262.5	1	1	1.74	344	250A
P6SMB300AL300A	256	285	315	1	1	1.45	414	300A

UNIDIRECTIONAL TYPE- ELECTRICAL CHARACTERISTICS - Ta = 25°C

Part Code	Working Peak Reverse Voltage	Breakdown Voltage		Test Current	Max. Reverse Leakage	Max. Reverse Surge Current	Max. Clamping Voltage	Marking Code
		VBR @ IT						
	VRWM	Min.	Max.	IT	IR @ VRWM	IPP	VC @ IPP	
	V	V	V	mA	μA	A	V	
P6SMB350AL350A	299.3	332.5	367.5	1	1	1.24	482	350A
P6SMB380AL380A	324.9	361	399	1	1	1.14	524.4	380A
P6SMB400AL400A	342	380	420	1	1	1.09	548	400A
P6SMB440AL440A	376.2	418	462	1	1	0.99	607.2	440A
P6SMB500AL500A	427.5	475	525	1	1	0.87	690	500A
P6SMB510AL510A	434.5	485	535	1	1	0.86	698	510A
P6SMB520AL520A	444.6	494	546	1	1	0.84	717.6	520A
P6SMB550AL550A	470.3	522.5	577.5	1	1	0.79	759	550A
P6SMB600AL600A	513	570	630	1	1	0.72	828	600A

BIDIRECTIONAL TYPE- ELECTRICAL CHARACTERISTICS - Ta = 25°C

Part Code	Working Peak Reverse Voltage	Breakdown Voltage		Test Current	Max. Reverse Leakage	Max. Reverse Surge Current	Max. Clamping Voltage	Marking Code
		VBR @ IT						
	VRWM	Min.	Max.	IT	IR @ VRWM	I _{PP}	V _C @ I _{PP}	
	V	V	V	mA	μA	A	V	
P6SMB6V8CL6V8C	5.8	6.46	7.14	10	1000	57.14	10.5	6V8C
P6SMB7V5CL7V5C	6.4	7.13	7.88	10	500	53.1	11.3	7V5C
P6SMB8V2CL8V2C	7.0	7.79	8.61	10	200	49.59	12.1	8V2C
P6SMB9V1CL9V1C	7.8	8.65	9.56	1	50	44.78	13.4	9V1C
P6SMB10CALS10C	8.6	9.5	10.5	1	10	41.38	14.5	10C
P6SMB11CALS11C	9.4	10.45	11.55	1	5	38.46	15.6	11C
P6SMB12CALS12C	10.2	11.4	12.6	1	5	35.93	16.7	12C
P6SMB13CALS13C	11.1	12.35	13.65	1	1	32.97	18.2	13C
P6SMB15CALS15C	12.8	14.25	15.75	1	1	28.3	21.2	15C
P6SMB16CALS16C	13.6	15.2	16.8	1	1	26.67	22.5	16C
P6SMB18CALS18C	15.3	17.1	18.9	1	1	23.81	25.2	18C
P6SMB20CALS20C	17.1	19	21	1	1	21.66	27.7	20C
P6SMB22CALS22C	18.8	20.9	23.1	1	1	19.61	30.6	22C
P6SMB24CALS24C	20.5	22.8	25.2	1	1	18.07	33.2	24C
P6SMB27CALS27C	23.1	25.65	28.35	1	1	16.0	37.5	27C
P6SMB30CALS30C	25.6	28.5	31.5	1	1	14.49	41.4	30C
P6SMB33CALS33C	28.2	31.35	34.65	1	1	13.13	45.7	33C
P6SMB36CALS36C	30.8	34.2	37.8	1	1	12.02	49.9	36C
P6SMB39CALS39C	33.3	37.05	40.95	1	1	11.13	53.9	39C
P6SMB43CALS43C	36.8	40.85	45.15	1	1	10.12	59.3	43C

BIDIRECTIONAL TYPE- ELECTRICAL CHARACTERISTICS - Ta = 25°C

Part Code	Working Peak Reverse Voltage	Breakdown Voltage		Test Current	Max. Reverse Leakage	Max. Reverse Surge Current	Max. Clamping Voltage	Marking Code
		VBR @ IT						
	VRWM	Min.	Max.	IT	IR @ VRWM	IPP	Vc @ IPP	
	V	V	V	mA	µA	A	V	
P6SMB47CAL547C	40.2	44.65	49.35	1	1	9.26	64.8	47C
P6SMB51CAL551C	43.6	48.45	53.55	1	1	8.56	70.1	51C
P6SMB56CAL556C	47.8	53.2	58.8	1	1	7.79	77	56C
P6SMB62CAL562C	53	58.9	65.1	1	1	7.06	85	62C
P6SMB68CAL568C	58.1	64.6	71.4	1	1	6.52	92	68C
P6SMB75CAL575C	64.1	71.25	78.75	1	1	5.83	103	75C
P6SMB82CAL582C	70.1	77.9	86.1	1	1	5.31	113	82C
P6SMB91CAL591C	77.8	86.45	95.55	1	1	4.8	125	91C
P6SMB100CL100C	85.5	95	105	1	1	4.38	137	100C
P6SMB110CL110C	94	104.5	115.5	1	1	3.95	152	110C
P6SMB120CL120C	102	114	126	1	1	3.64	165	120C
P6SMB130CL130C	111	123.5	136.5	1	1	3.35	179	130C
P6SMB150CL150C	128	142.5	157.5	1	1	2.9	207	150C
P6SMB160CL160C	136	152	168	1	1	2.74	219	160C
P6SMB170CL170C	145	161.5	178.5	1	1	2.56	234	170C
P6SMB180CL180C	154	171	189	1	1	2.44	246	180C
P6SMB200CL200C	171	190	210	1	1	2.19	274	200C
P6SMB220CL220C	185	209	231	1	1	1.83	328	220C
P6SMB250CL250C	214	237.5	262.5	1	1	1.74	344	250C
P6SMB300CL300C	256	285	315	1	1	1.45	414	300C

BIDIRECTIONAL TYPE- ELECTRICAL CHARACTERISTICS - Ta = 25°C

Part Code	Working Peak Reverse Voltage	Breakdown Voltage		Test Current	Max. Reverse Leakage	Max. Reverse Surge Current	Max. Clamping Voltage	Marking Code
		VBR @ IT						
	VRWM	Min.	Max.	IT	IR @ VRWM	IPP	VC @ IPP	
	V	V	V	mA	μA	A	V	
P6SMB350CL350C	299.3	332.5	367.5	1	1	1.24	482	350C
P6SMB380CL380C	324.9	361	399	1	1	1.14	524.4	380C
P6SMB400CL400C	342	380	420	1	1	1.09	548	400C
P6SMB440CL440C	376.2	418	462	1	1	0.99	607.2	440C
P6SMB500CL500C	427.5	475	525	1	1	0.87	690	500C
P6SMB510CL510C	434.5	485	535	1	1	0.86	698	510C
P6SMB520CL520C	444.6	494	546	1	1	0.84	717.6	520C
P6SMB550CL550C	470.3	522.5	577.5	1	1	0.79	759	550C
P6SMB600CL600C	513	570	630	1	1	0.72	828	600C

RATINGS AND CHARACTERISTICS CURVES- For Reference Only, Ta=25°C Unless Otherwise Specified.

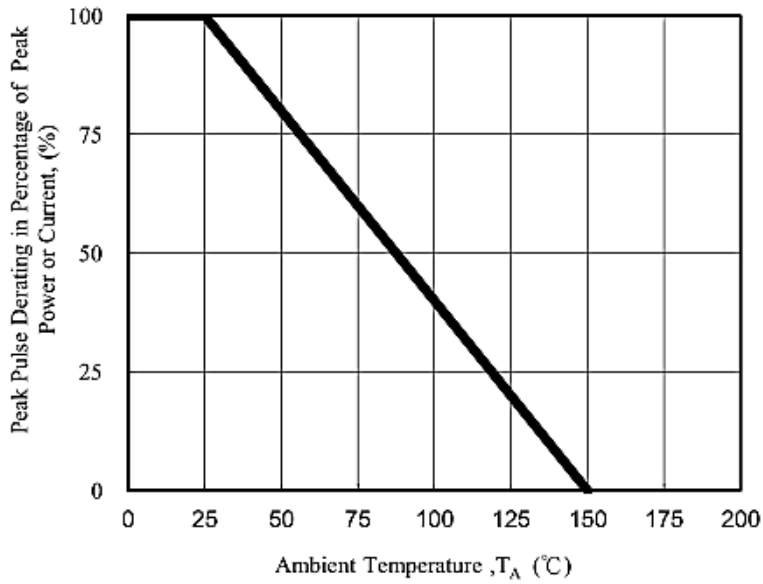


Fig. 1 - Pulse Derating Curve

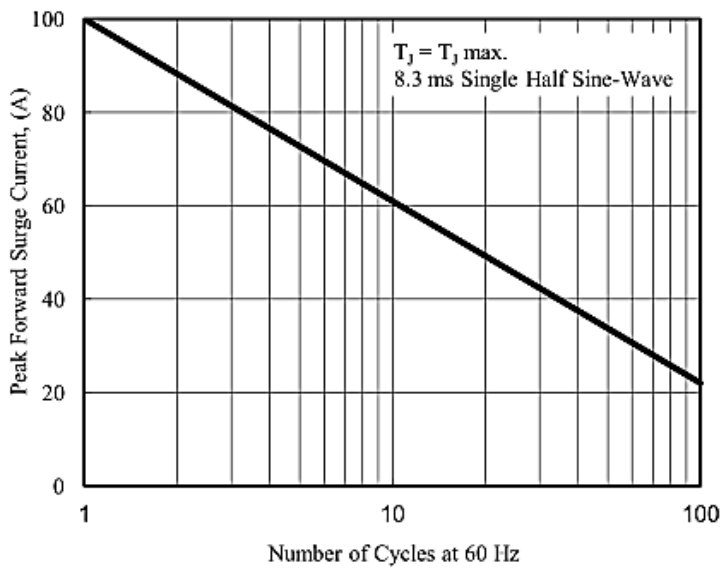


Fig. 2 - Maximum Non-Repetitive
Surge Current

RATINGS AND CHARACTERISTICS CURVES- For Reference Only, $T_a=25^{\circ}\text{C}$ Unless Otherwise Specified.

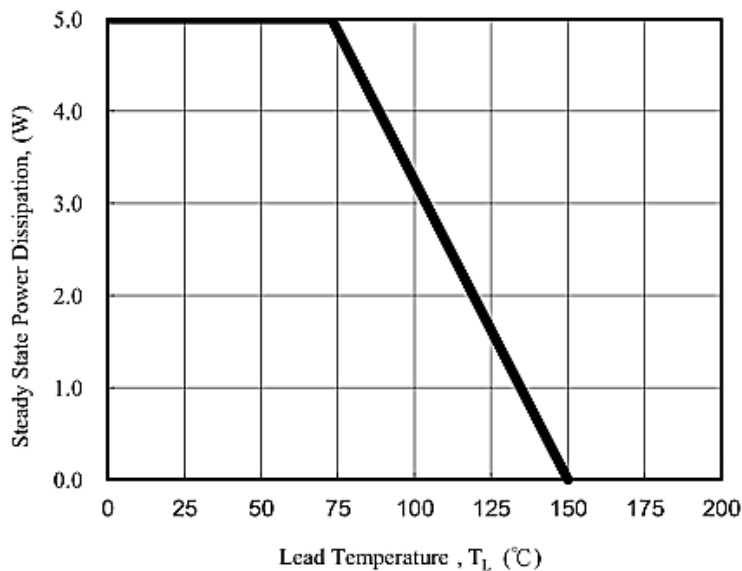


Fig. 3 - Steady State Power Derating Curve

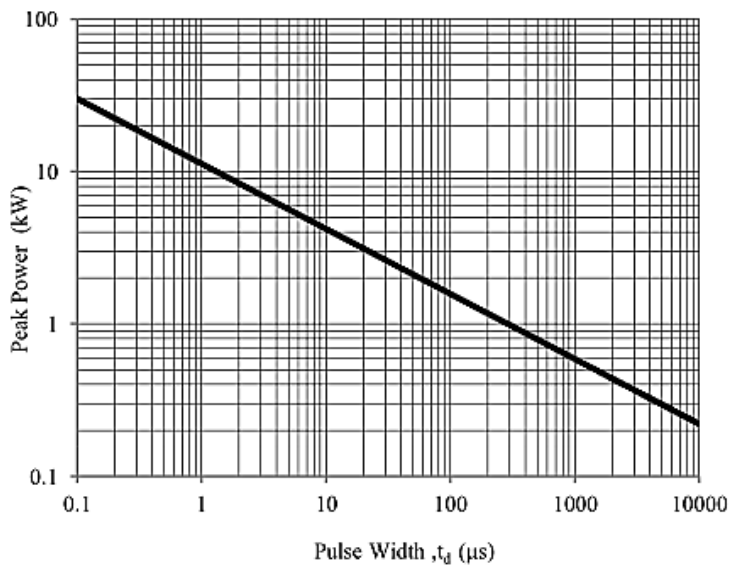


Fig. 4 - Peak Pulse Power Rating Curve

RATINGS AND CHARACTERISTICS CURVES- For Reference Only, $T_a=25^\circ\text{C}$ Unless Otherwise Specified.



Fig. 5 - Pulse Waveform

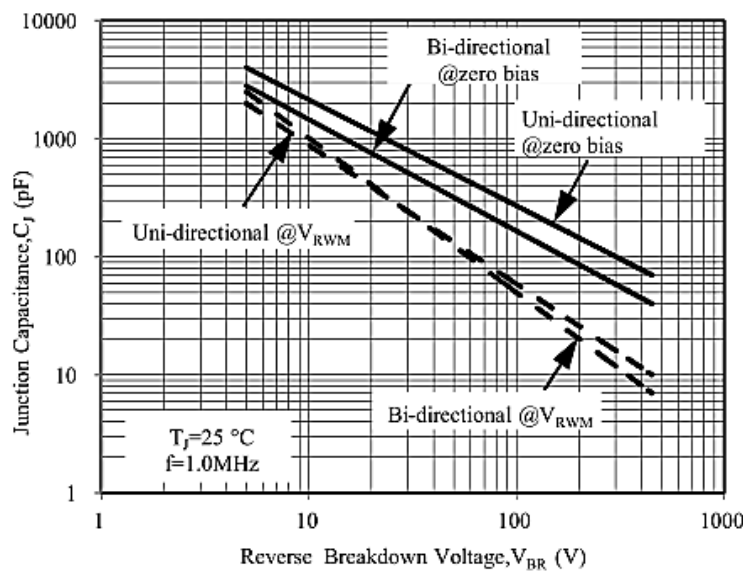
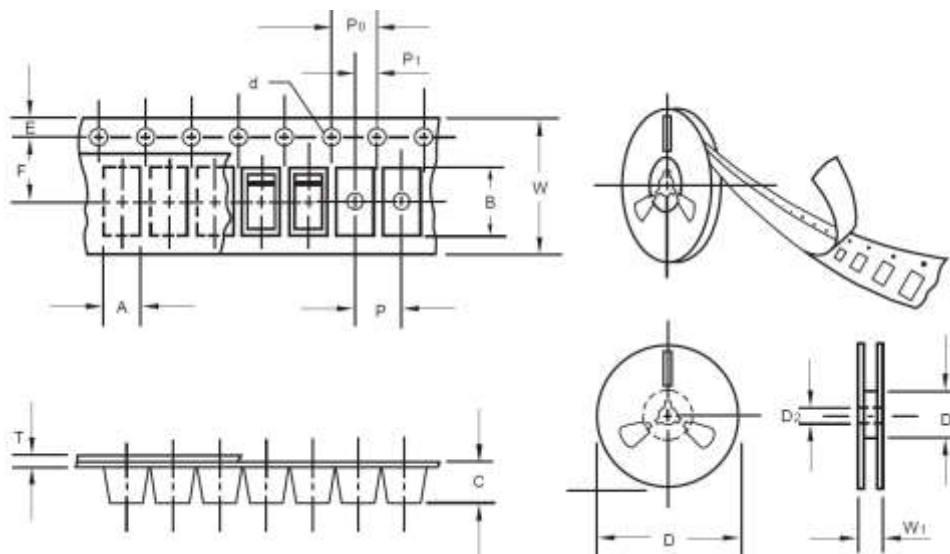


Fig. 6 - Typical Junction Capacitance

RECOMMENDED SOLDERING PARAMETERS – FOR REFERENCE ONLY


PROFILE FEATURE		PB-FREE ASSEMBLY
Average Ramp-up Rate (T_L Max to T_p)		3°C/second Max
Preheat	Temperature Min (T_s Min.)	150°C
	Temperature Max (T_s Max.)	200°C
	Time (t_s Min. to t_s Max.)	60 ~ 180 seconds
Time maintained above	Temperature (T_L)	217°C
	Time (t_L)	60 ~ 150 seconds
Peak/Classification Temperature (T_p)		260 °C
Time within 5°C of actual Peak Temperature (t_p)		20 ~ 40 seconds
Ramp-down Rate		6 °C /Second Max.
Time 25 °C to Peak Temperature		8 Minutes Max.
Suggest reflow times		3 Times Max.

TAPE/REEL - Unit: mm, All Devices are packed in accordance with EIA standard RS-481-A and specifications



ITEM	SYMBOL	TOLERANCE	SMB/DO-214AA
Carrier width	A	0.1	3.81
Carrier Length	B	0.1	5.41
Carrier Depth	C	0.1	2.42
Sprocket hole	d	0.05	1.50
13"Reel outside diameter	D	2.0	330.00
13"Reel inner diameter	D1	Min.	50.00
Feed hole diameter	D2	0.5	13.00
Sprocket hole position	E	0.1	1.75
Punch hole position	F	0.1	5.55
Punch hole pitch	P	0.1	8.00
Sprocket hole pitch	P0	0.1	4.00
Embossment center	P1	0.1	2.00
Overall tape thickness	T	0.1	0.30
Tape width	W	0.3	12.00
Reel width	W1	1.0	12.30
Qty./Reel (pcs)	3000		

IMPORTANT NOTES AND DISCLAIMER

1. **ROHS COMPLIANCE:** The levels of RoHS restricted materials in this product are below the maximum concentration values (also referred to as the threshold limits) permitted for such substances, or are used in an exempted application, in accordance with EU RoHS Directive (EU) 2015/863 EC (RoHS3). RoHS Test Report for this product can be obtained at Download Center.
2. **REACH COMPLIANCE:** REACH substances of high concern (SVHCs) information is available for this product. Since the European Chemical Agency (ECHA) has published notice of their intent to frequently revise the SVHC listing for the foreseeable future, REACH Test Report for this product can be obtained at Download Center.
3. All Product parametric performance is indicated in the Electrical Characteristics for the listed herein test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.
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