

MT3287/B

N-Channel Power MOSFET
70V, 80A, 6.8mΩ

Features

- Max $R_{DS(on)}$ = 6.8mΩ at $V_{GS} = 10V, I_D = 40A$
- High performance trench technology for extremely low $R_{DS(on)}$
- High power and current handling capability

General Description

This N-Channel MOSFET has been designed specifically to improve the overall efficiency of DC/DC converters using either synchronous or conventional switching PWM controllers. It has been optimized for low gate charge, low $R_{DS(ON)}$ and fast switching speed.

Applications

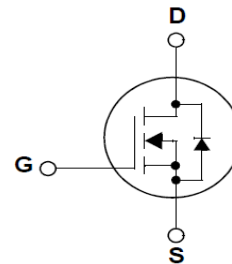
- DC-DC primary bridge
- DC-DC Synchronous rectification
- Power Management for Inverter Systems



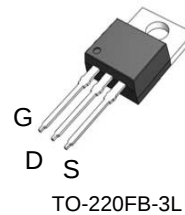
MT Semiconductor®

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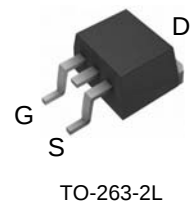
Simplified Schematic



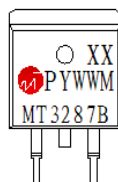
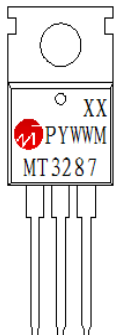
MARKING DIAGRAM & PIN ASSIGNMENT



TO-220FB-3L



TO-263-2L



Package Code

MT3287: T0-220FB-3L

MT3287B: T0-263-2L

Date Code

PYWWM

Lot No

XX

Absolute Maximum Ratings

Symbol	Parameter	Rating	Unit
Common Ratings ($T_A = 25^\circ\text{C}$ Unless Otherwise Noted)			
V_{DS}	Drain-Source Voltage	70	V
V_{GS}	Gate-Source Voltage	± 25	
T_J	Maximum Junction Temperature	175	$^\circ\text{C}$
T_{STG}	Storage Temperature Range	-55 to 175	$^\circ\text{C}$
I_S	Diode Continuous Forward Current	$T_C = 25^\circ\text{C}$ 80	A

Mounted on Large Heat Sink

I _{DM}	Pulsed Drain Current *		320**	A
I _D	Continuous Drain Current	T _C =25°C	80	A
		T _C =100°C	66	
P _D	Maximum Power Dissipation	T _C =25°C	115	W
		T _C =100°C	57.7	
R _{θJC}	Thermal Resistance-Junction to Case		1.3	°C/W
R _{θJA}	Thermal Resistance-Junction to Ambient		62.5	
Avalanche Ratings				
E _{AS}	Avalanche Energy, Single Pulsed	L=0.5mH	320***	mJ

Note : * Repetitive rating ; pulse width limited by junction temperature

** Drain current is limited by junction temperature

*** $V_D=55\text{V}$

Electrical Characteristics ($T_A = 25^{\circ}\text{C}$ Unless Otherwise Noted)

Symbol	Parameter	Test Conditions				Unit
			Min.	Typ.	Max.	
Static Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _{DS} =250μA	70	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =68V, V _{GS} =0V	-	-	1	μA
		T _J =85°C	-	-	10	
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _{DS} =250μA	2	3	4	V
I _{GSS}	Gate Leakage Current	V _{GS} =±25V, V _{DS} =0V	-	-	±100	nA
R _{DS(ON)} *	Drain-Source On-state Resistance	V _{GS} =10V, I _{DS} =40A	-	6.8	7.8	mΩ
Diode Characteristics						
V _{SD} *	Diode Forward Voltage	I _{SD} =40A, V _{GS} =0V	-	0.8	1	V
t _{rr}	Reverse Recovery Time	I _{SD} =40A, dI _{SD} /dt=100A/μs	-	33	-	ns
Q _{rr}	Reverse Recovery Charge		-	61	-	nC

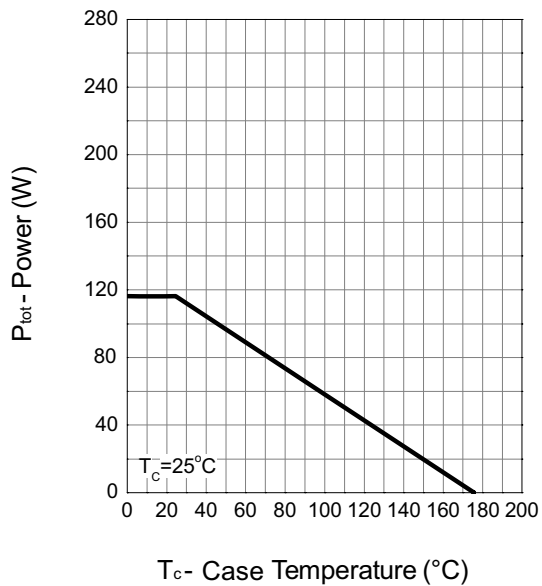
Electrical Characteristics (Cont.) ($T_A = 25^\circ\text{C}$ Unless Otherwise Noted)

Symbol	Parameter	Test Conditions				Unit
			Min.	Typ.	Max.	
Dynamic Characteristics						
R _G	Gate Resistance	V _{GS} =0V, V _{DS} =0V, F=1MHz	-	1.8	-	Ω
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =25V, Frequency=1.0MHz	-	3203	-	pF
C _{oss}	Output Capacitance		-	362	-	
C _{rss}	Reverse Transfer Capacitance		-	277	-	
t _{d(ON)}	Turn-on Delay Time	V _{DD} =34V, R _G =3 Ω, I _{DS} =40A, V _{GS} =10V,	-	15	-	ns
T _r	Turn-on Rise Time		-	13	-	
t _{d(OFF)}	Turn-off Delay Time		-	20	-	
T _f	Turn-off Fall Time		-	8	-	
Gate Charge Characteristics						
Q _g	Total Gate Charge	V _{DS} =55V, V _{GS} =10V, I _{DS} =40A	-	84	-	nC
Q _{gs}	Gate-Source Charge		-	14	-	
Q _{gd}	Gate-Drain Charge		-	30	-	

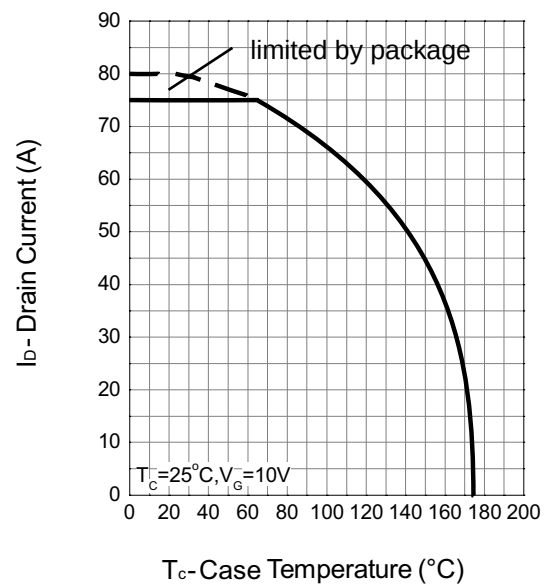
Note * : Pulse test ; pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 2\%$.

Typical Operating Characteristics

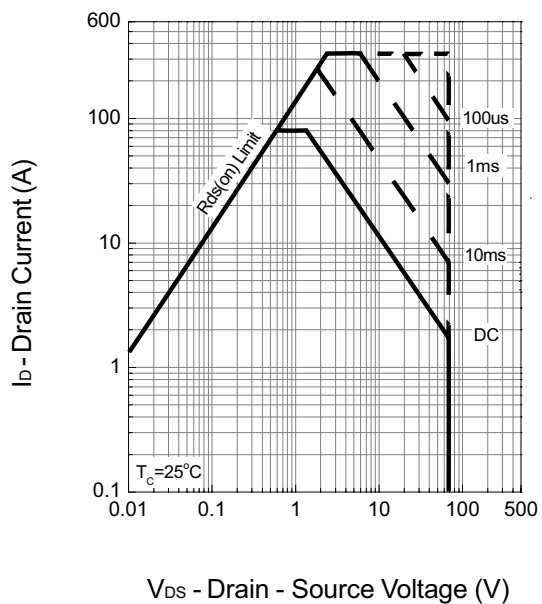
Power Dissipation



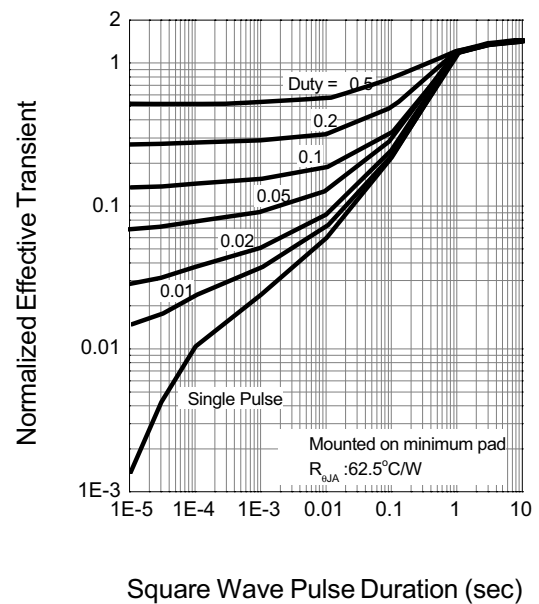
Drain Current



Safe Operation Area

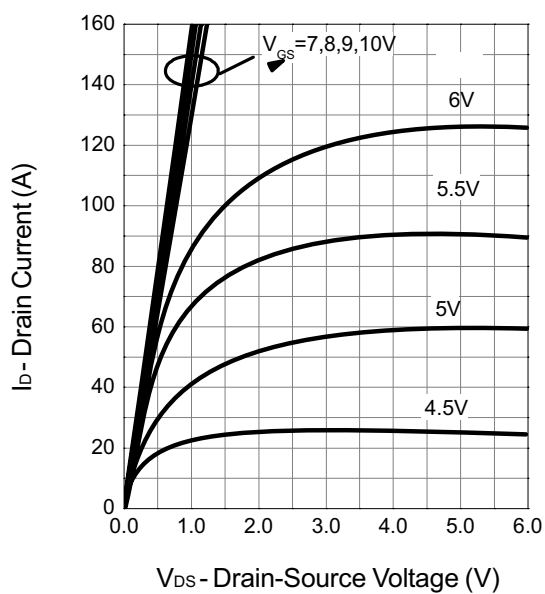


Thermal Transient Impedance

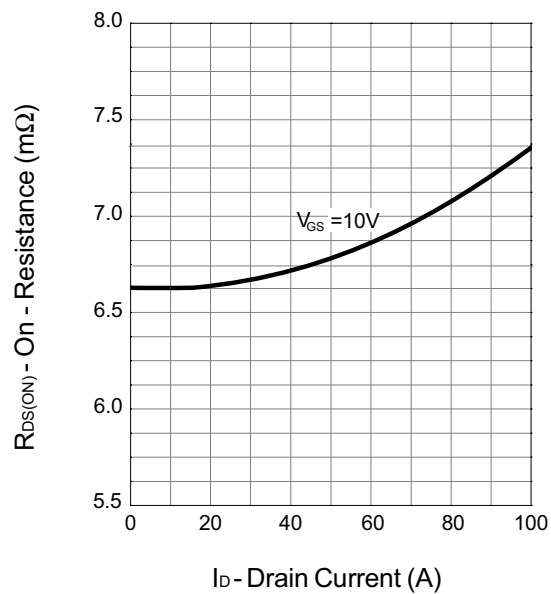


Typical Operating Characteristics (Cont.)

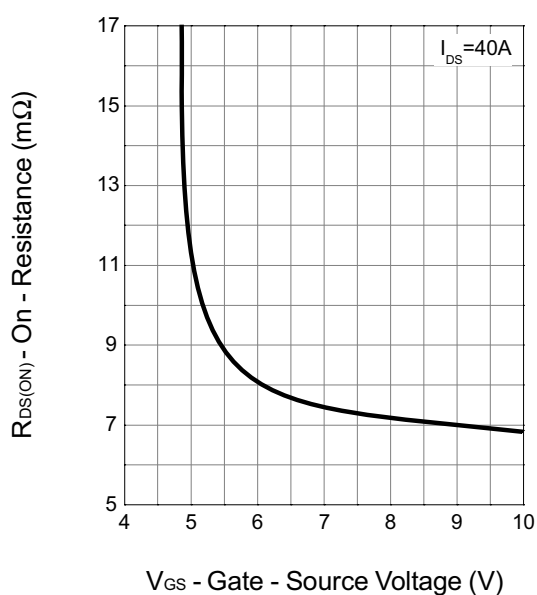
Output Characteristics



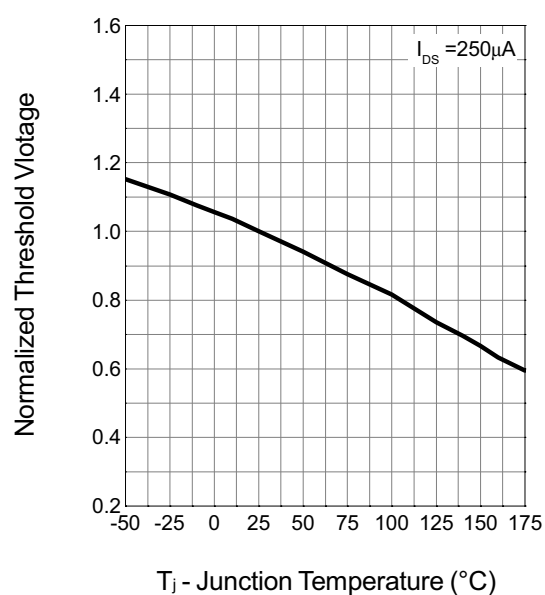
Drain-Source On Resistance



Drain-Source On Resistance

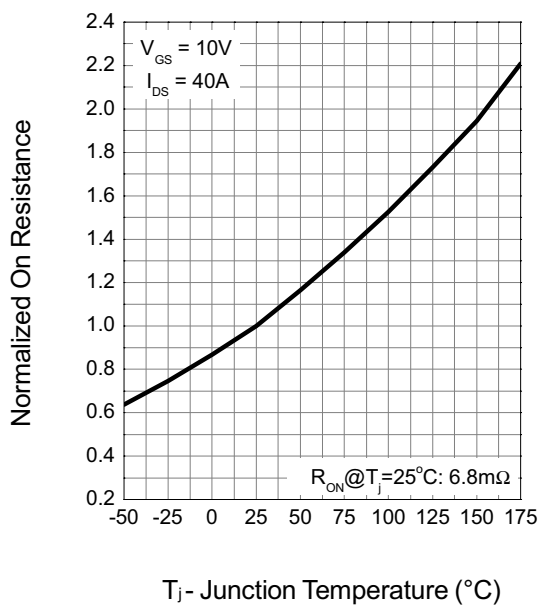


Gate Threshold Voltage

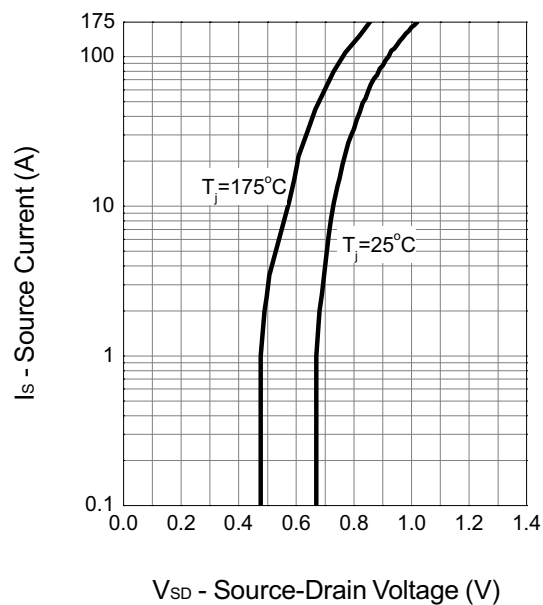


Typical Operating Characteristics (Cont.)

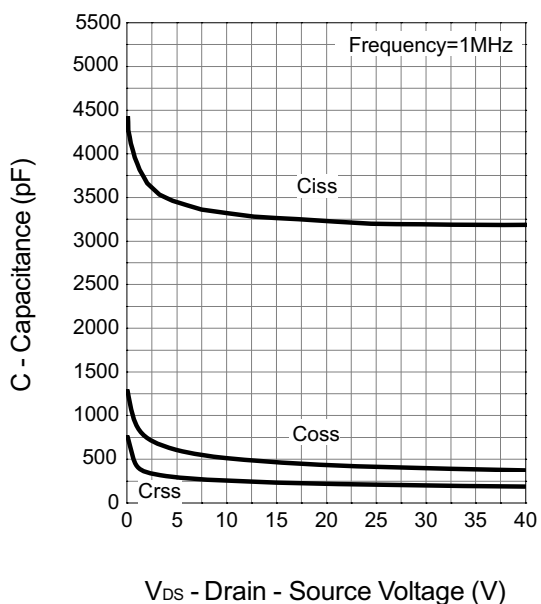
Drain-Source On Resistance



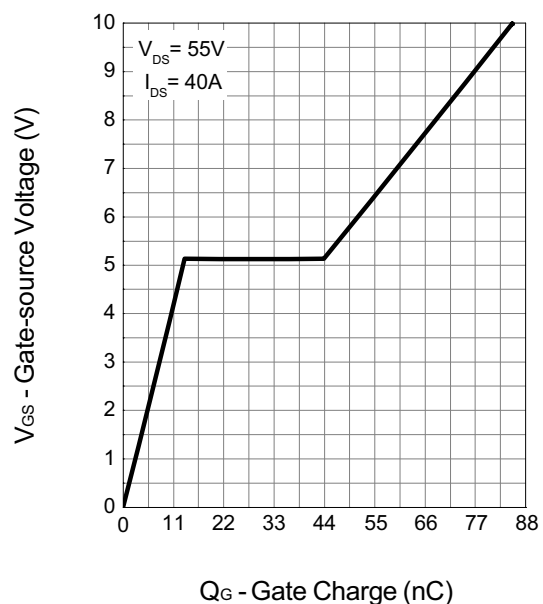
Source-Drain Diode Forward



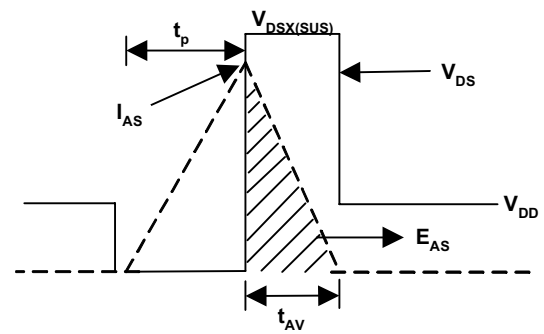
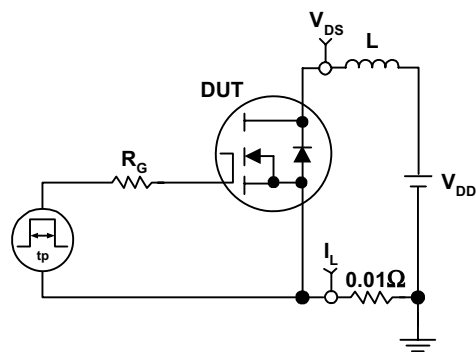
Capacitance



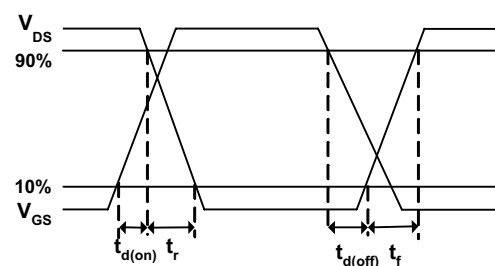
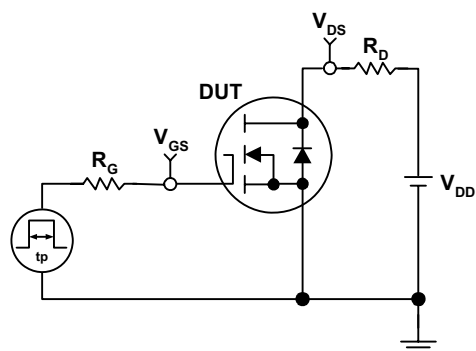
Gate Charge



Avalanche Test Circuit and Waveforms

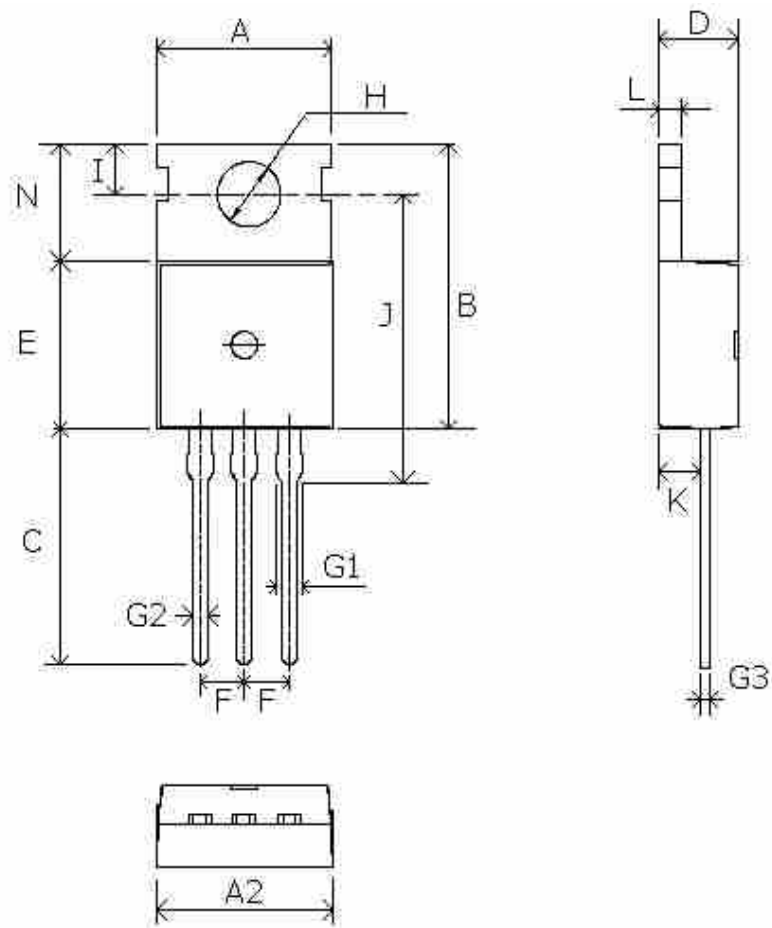


Avalanche Test Circuit and Waveforms



Package Information

TO-220FB-3L

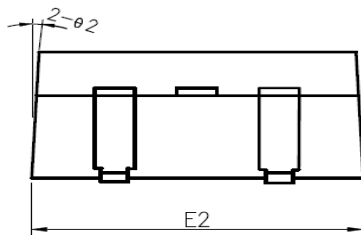
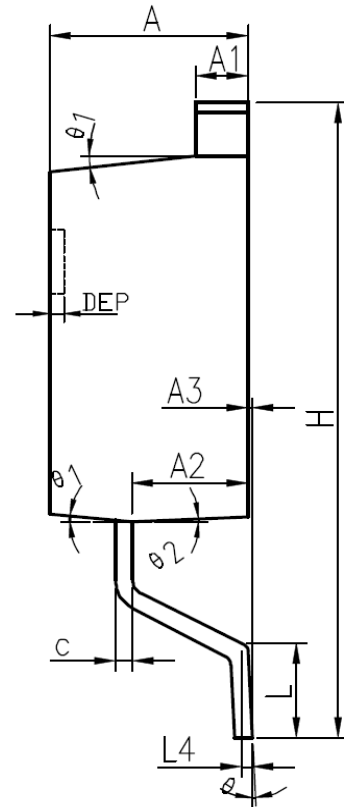
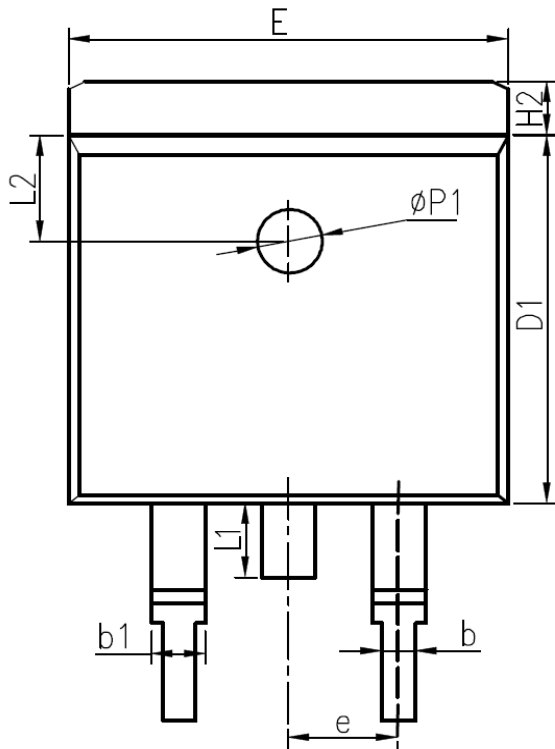


单位: mm

Symbol	Min	Max	Symbol	Min	Max
A	9.6	10.4	G2	0.7	0.95
A2	9.8	10.2	G3	0.45	0.6
B	15.5	15.7	H(Φ)	3.7	4
C	12.7	14.3	I	2.7	2.9
D	4.3	4.7	J	15.9	16.4
E	8.85	9.25	K	2.2	2.6
F	2.54		L	1.25	1.4
G1	1.26	1.41	N	6.4	6.8

Package Information

TO-263-2L



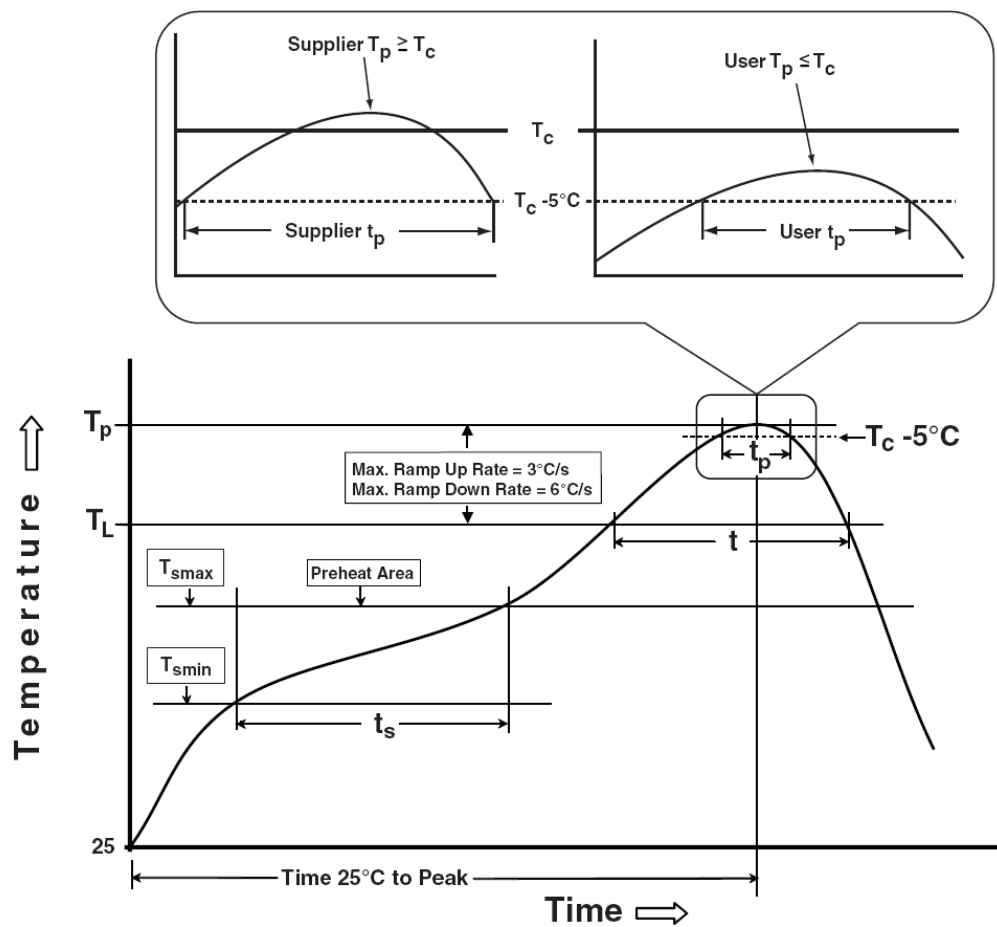
COMMON DIMENSIONS

SYMBOL	MM			INCH		
	MIN	NOM	MAX	MIN	NOM	MAX
A	4.40	4.57	4.70	0.173	0.180	0.185
A1	1.22	1.27	1.32	0.048	0.050	0.052
A2	2.59	2.69	2.79	0.102	0.106	0.110
A3	0.00	0.10	0.20	0.000	0.004	0.008
b	0.77	0.813	0.90	0.030	0.032	0.035
b1	1.20	1.270	1.36	0.047	0.050	0.054
c	0.34	0.381	0.47	0.013	0.015	0.019
D1	8.60	8.70	8.80	0.339	0.343	0.346
E	10.00	10.16	10.26	0.394	0.400	0.404
E2	10.00	10.10	10.20	0.394	0.398	0.402
e	2.54 BSC			0.100 BSC		
H	14.70	15.10	15.50	0.579	0.594	0.610
H2	1.17	1.27	1.40	0.046	0.050	0.055
L	2.00	2.30	2.60	0.079	0.091	0.102
L1	1.45	1.55	1.70	0.057	0.061	0.067
L2	2.50 REF			0.098 REF		
L4	0.25 BSC			0.010 BSC		
	0°	5°	8°	0°	5°	8°
1	5°	7°	9°	5°	7°	9°
2	1°	3°	5°	1°	3°	5°
ΦP1	1.40	1.50	1.60	0.055	0.059	0.063
DEP	0.05	0.10	0.20	0.002	0.004	0.008

Devices Per Unit

Package Type	Unit	Quantity
TO-220FB-3L	Tube	50
TO-263-2L	Tube	50

Classification Profile



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