/ Descriptions

TO-220F N

N-CHANNEL 650V Super-Junction Power MOSFET in a TO-220F Plastic Package.

/ Features

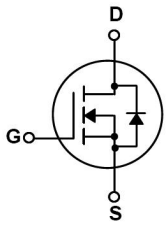
$R_{DS(on)}$×Qg 100% ROHS

Very low $R_{DS(on)}$×Qg,100%avalanche tested,RoHS compliant, HF Product.

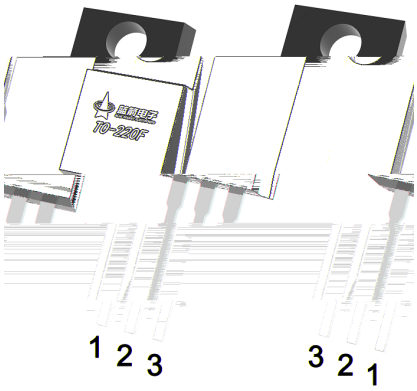
/ Applications

For switch mode power supply, uninterruptible power supply, power factor correction.

/ Equivalent Circuit



/ Pinning



PIN1 G PIN 2 D PIN 3 S

/ Marking

See Marking Instructions.

	Symbol	Rating	Unit
	V_{DSS}	650	V
	I_D(Tc=25)	6	A
	I_{DM}	24	A
	V_{GS}	±30	V
	E_{AS}	146.5	mJ
	I_{AS}	5.2	A
Power Dissipation	P_D(Tc=25)	26	W
Operating and Storage Temperature Range	T_J,T_{STG}	-55 to 150	
Junction-to-Ambient	$R_{\theta JA}$	62.5	/W
Junction-to-Case	$R_{\theta JC}$	4.8	/W

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V I_D=250μA	650			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=650V V_{GS}=0V T_J=25			1.0	μA
Gate-Body Leakage Current, Forward	I_{GSS}	V_{GS}=±30V			±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS} I_D=250μA	2.5		4.5	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS}=10V I_D=1.5A		630	800	mΩ
Drain-Source Diode Forward Voltage	V_{SD}	V_{GS}=0V I_{SD}=1A T_J=25			1.3	V
Gate Resistance	R_g	V_{GS} = 0V f = 1.0MHz		7.2		Ω
Input Capacitance	C_{iss}	V_{DS}=25V V_{GS}=0V f=1.0MHz		275		pF
Output Capacitance	C_{oss}			450		pF
Reverse Transfer Capacitance	C_{rss}			8		pF
Turn-On Delay Time	$t_{d(on)}$	V_{DS}=400V I_D=3A V_{GS}=10V R_G=25Ω		31.9		ns
Turn-On Rise Time	t_r			23.2		ns

/ Electrical Characteristics(Ta=25)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Continuous Diode Forward Current	I_S				6	A
Total Gate Charge	Q_g	V_{DS}=520V I_D=3A V_{GS}=10V		10.4		nC
Gate-Source Charge	Q_{gs}			2.5		nC
Gate-Drain Charge	Q_{gd}			2.0		nC
Reverse recovery time	T_{rr}	V_R=400V I_F=3A, dI_F/dt=100 A/μs		150		ns
Reverse recovery charge	Q_{rr}			1.06		uC

/ Electrical Characteristic Curve

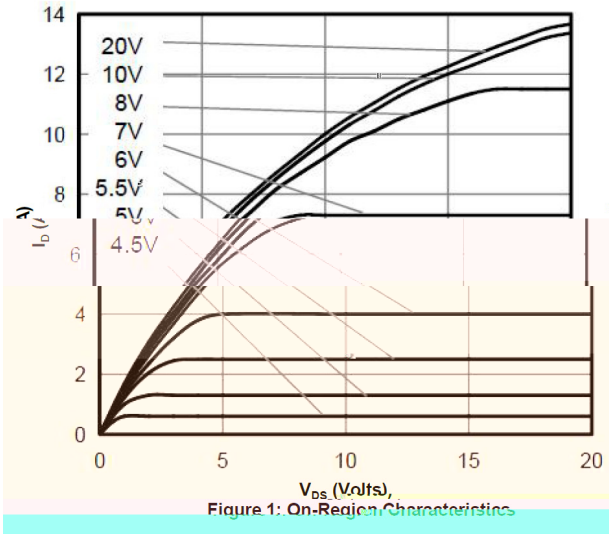


Figure 1: On-Region Characteristics

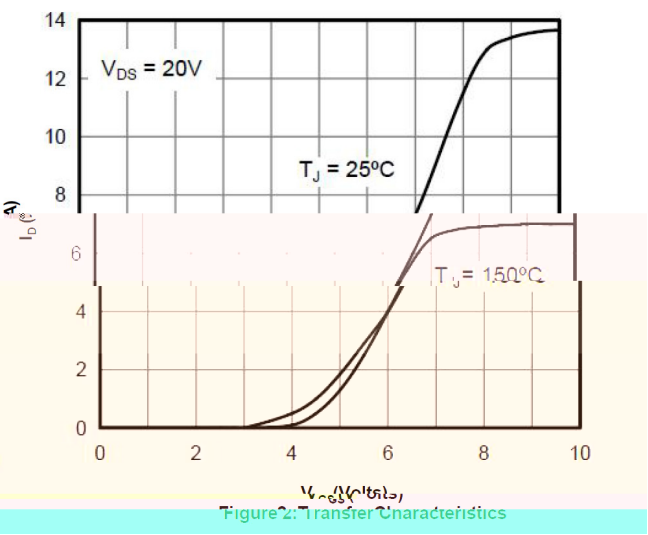


Figure 2: Transfer Characteristics

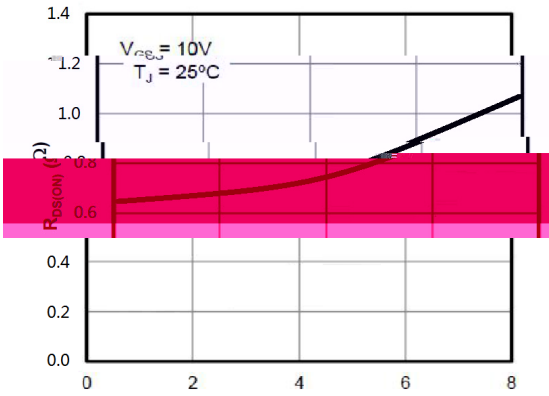


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

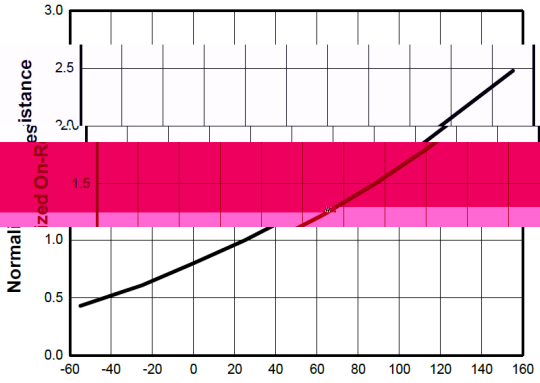
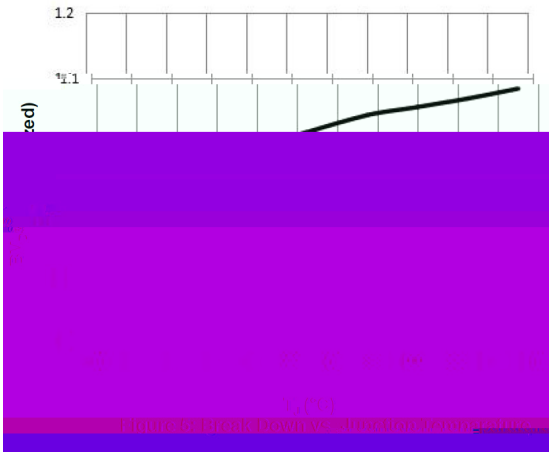
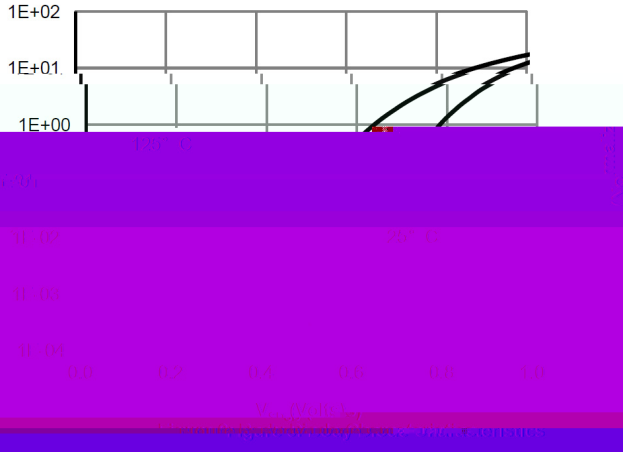


Figure 4: On-Resistance vs. Junction Temperature





/ Electrical Characteristic Curve

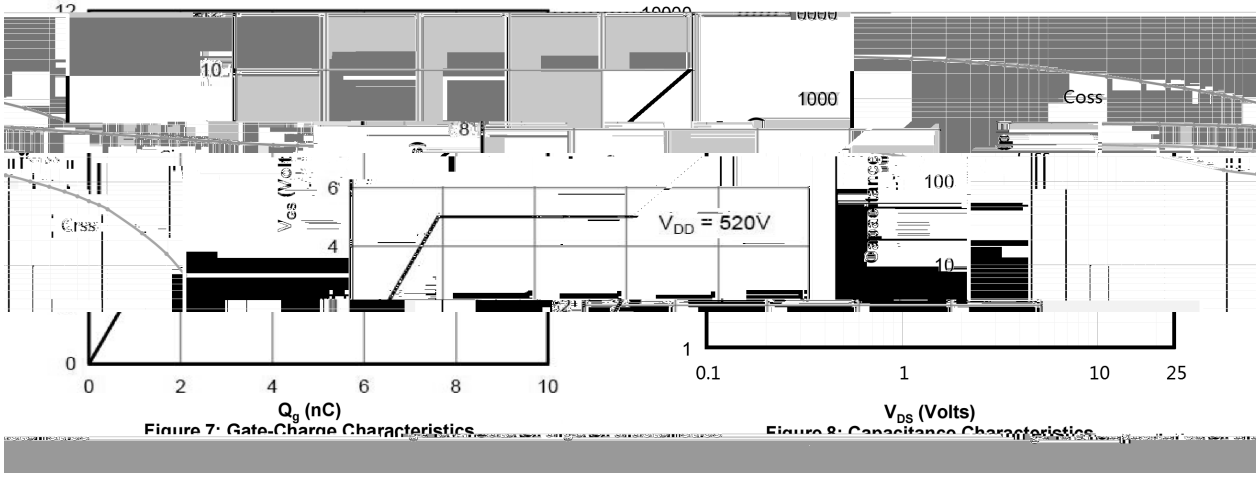


Figure 7: Gate-Charge Characteristics

Figure 8: Capacitance Characteristics

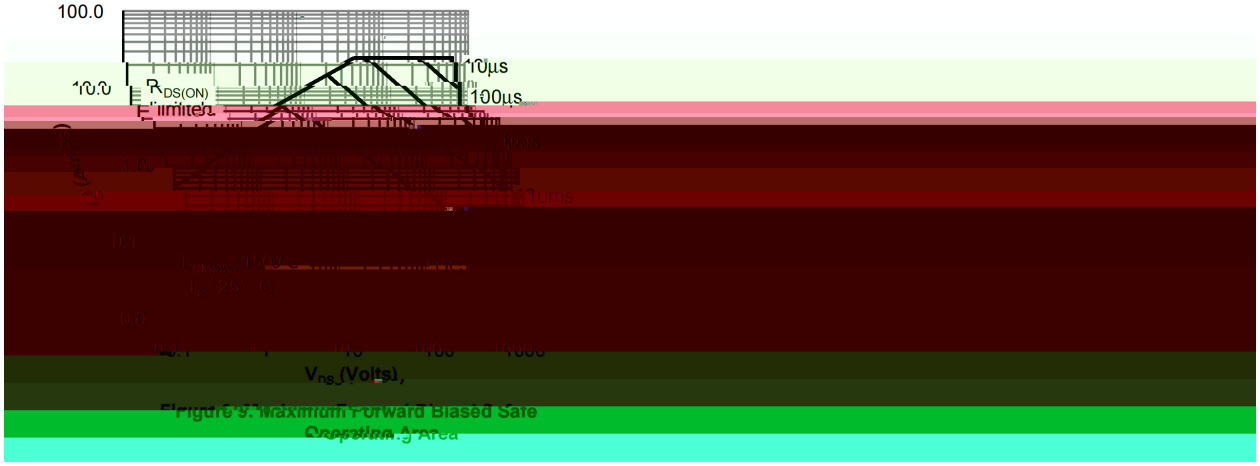


Figure 9: Maximum Forward Biased Safe Operating Area

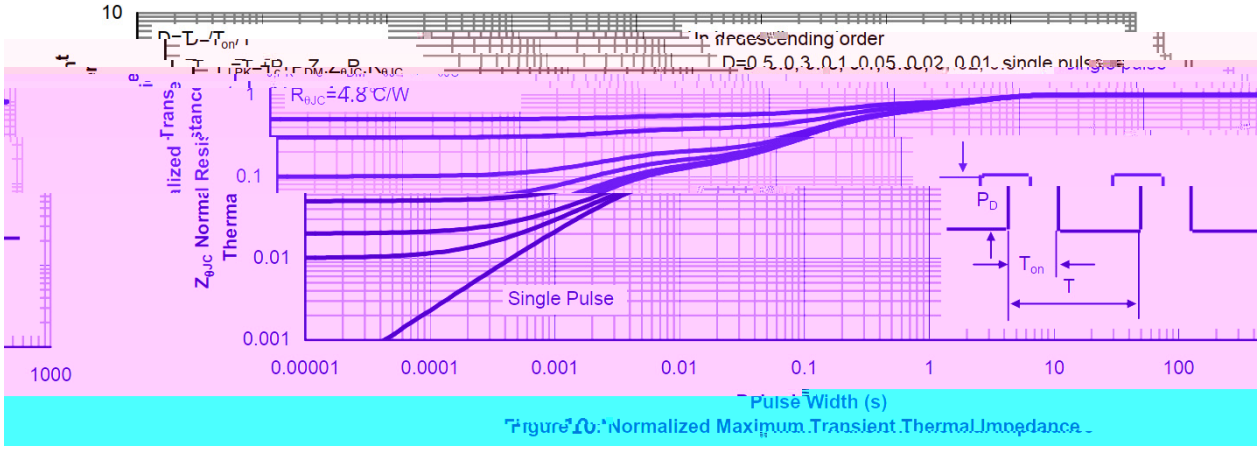
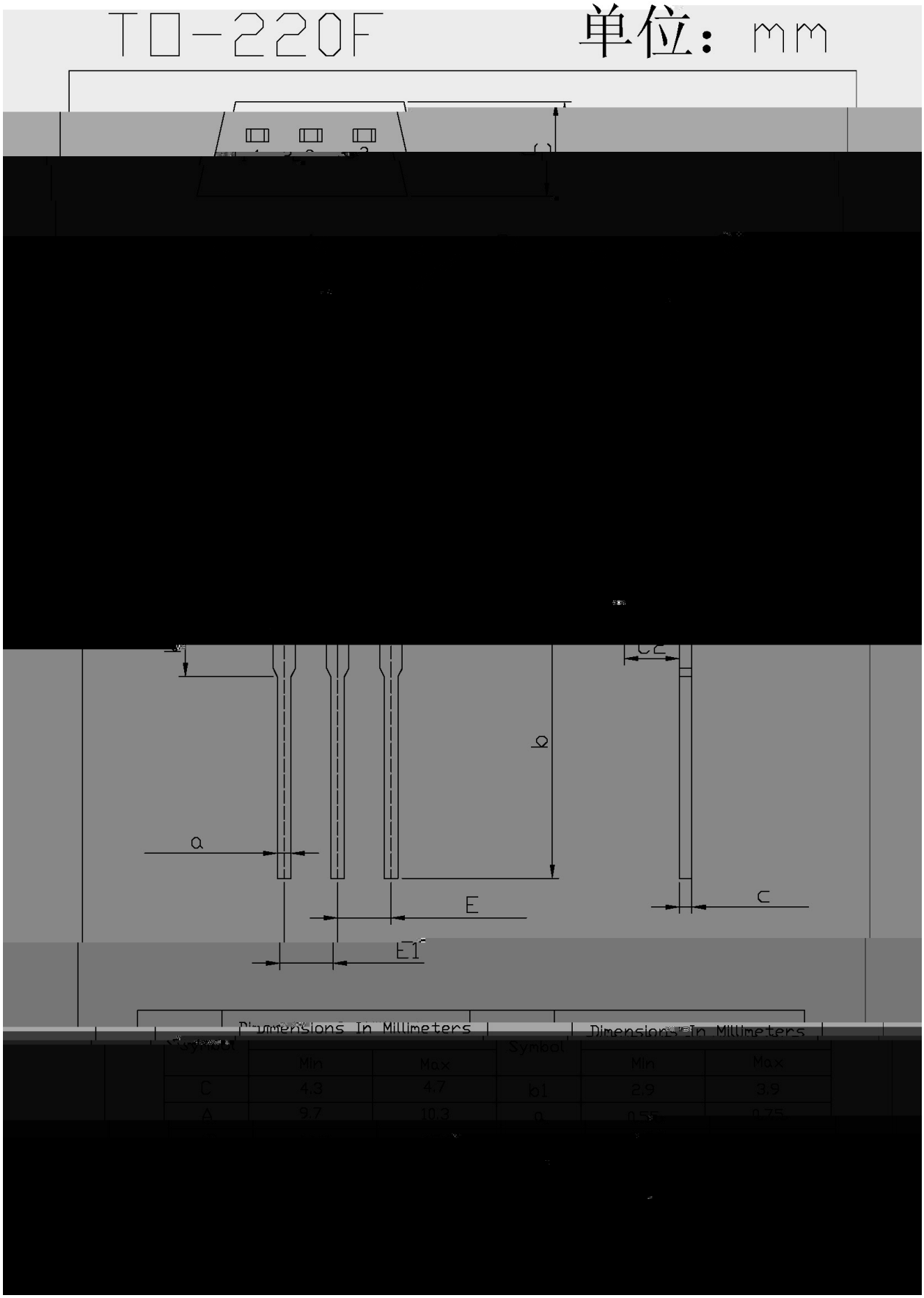
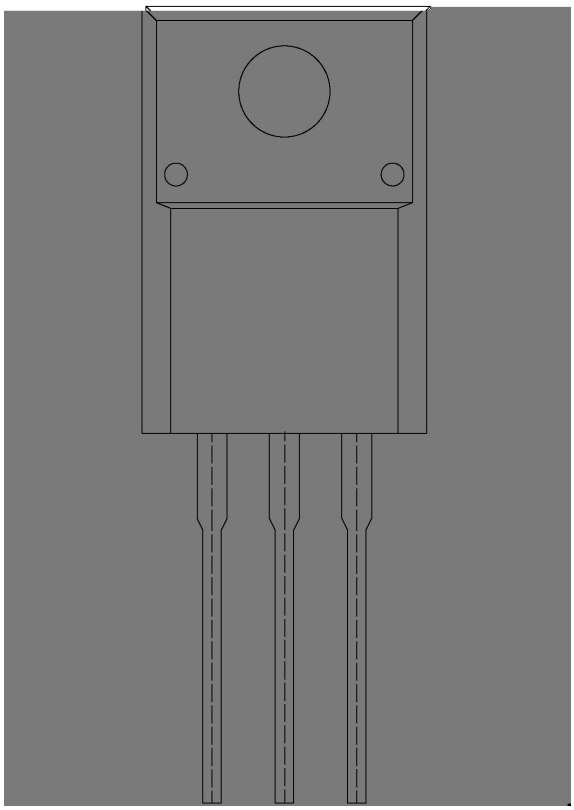


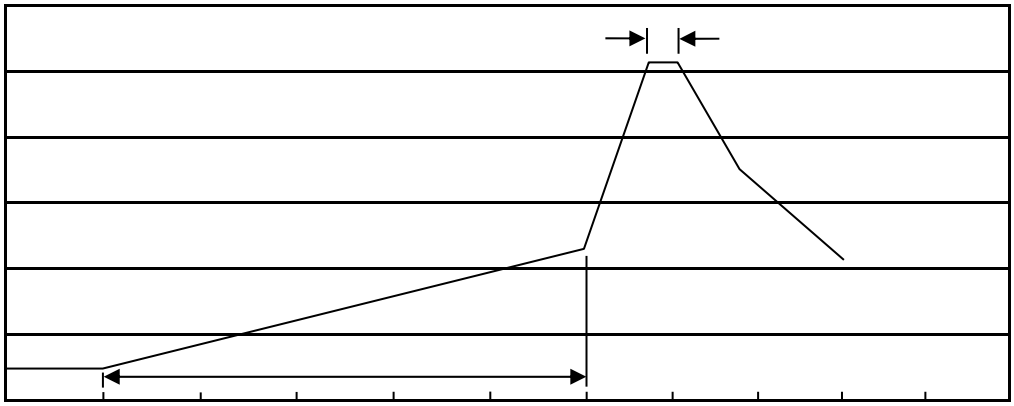
Figure 10: Normalized Maximum Transient Thermal Impedance

/ Package Dimensions





( ) / Temperature Profile for Dip Soldering(Pb-Free)



Note:

1 25 150 60 90sec;

1.Preheating:25~150 , Time:60~90sec.

2 255 5 5 0.5sec;

2.Peak Temp.:255 5 , Duration:5 0.5sec.

3 2 10 /sec.

3. Cooling Speed: 2~10 /sec.

/ Resistance to Soldering Heat Test Conditions

270 5 10 1 sec. Temp.:270±5 Time:10±1 sec

/ Packaging SPEC.

/ BULK

Package Type	Units					Dimension		(unit mm³)
TO-220/F	200	10	2,000	5	10,000	135×190	237×172×102	560×245×195

/ TUBE

Package Type	Units					Dimension		(unit mm³)
TO-220/F	50	20	1,000	5	5,000	532×31.4×5.5	555×164×50	575×290×180

/ Notices

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