Features

- 100% UIS + R_g Tested
- Avalanche Rated
- Reliable and Rugged
- Lead Free and Green Devices Available (RoHS Compliant)

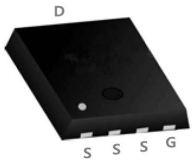
Applications

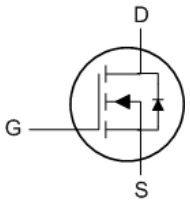
- Power Management in Notebook Computer, Portable Equipment and Battery Powered Systems.

Product Summery

BVDSS	RDSON	ID
25V	3.4mΩ(max.)	70A

DFN3.3x3.3-8-EP Pin Configuration





Absolute Maximum Ratings (T_A = 25°C Unless Otherwise Noted)

Symbol	Parameter		Rating	Unit
Common Ratings				
V_{DSS}	Drain-Source Voltage		25	V
V_{GSS}	Gate-Source Voltage		±12	
T_J	Maximum Junction Temperature		150	°C
T_{STG}	Storage Temperature Range		-55 to 150	
I_S	Diode Continuous Forward Current	T_C=25°C	70[a]	A
I_D	Continuous Drain Current	T_C=25°C	70[a]	
		T_C=100°C	60	
I_{DM}	Pulsed Drain Current	T_C=25°C	200[b]	
P_D	Maximum Power Dissipation	T_C=25°C	62.5	W
		T_C=100°C	25	
$R_{\theta JC}$	Thermal Resistance-Junction to Case	Steady State	2	°C/W
I_D	Continuous Drain Current	T_A=25°C	20	A
		T_A=70°C	16	
P_D	Maximum Power Dissipation	T_A=25°C	1.78	W
		T_A=70°C	1.14	
$R_{\theta JA}$	Thermal Resistance-Junction to Ambient	t ≤ 10s	35	°C/W
		Steady State	70	
I_{AS} [c]	Avalanche Current, Single pulse	L=0.1mH	50	A
E_{AS} [c]	Avalanche Energy, Single pulse	L=0.1mH	125	mJ

Note a：Package is limited by 50A.
Note b：Pulse width is limited by maximum junction temperature.
Note c：UIS tested and pulse width is limited by maximum junction temperature 150°C (initial temperature T_J = 25°C).

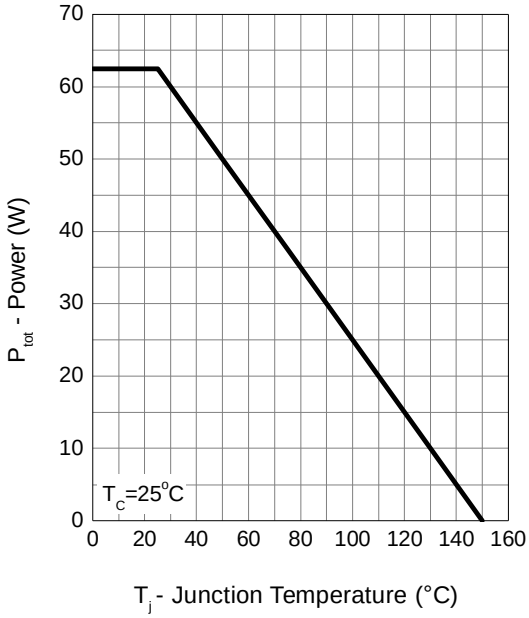
Electrical Characteristics (T_A = 25°C Unless Otherwise Noted)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V, I_{DS}=250μA	25	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=24V, V_{GS}=0V	-	-	1	μA
		T_J=85°C	-	-	30	
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_{DS}=250μA	0.5	0.8	1.1	V
I_{GSS}	Gate Leakage Current	V_{GS}=±12V, V_{DS}=0V	-	-	±10	μA
$R_{DS(ON)}$ [d]	Drain-Source On-state Resistance	V_{GS}=4.5V, I_{DS}=20A	-	2.5	3.4	mΩ
		T_J=125°C	-	3.9	-	
		V_{GS}=2.5V, I_{DS}=20A	-	3.0	4.0	
Gfs	Forward Transconductance	V_{DS}=5V, I_{DS}=20A	-	74	-	S
Diode Characteristics						
V_{SD} [d]	Diode Forward Voltage	I_{SD}=20A, V_{GS}=0V	-	0.7	1.1	V
t_{rr}	Reverse Recovery Time	I_F=20A, dI_{SD}/dt=100A/μs	-	14.8	-	ns
t_a	Charge Time		-	7.1	-	
t_b	Discharge Time		-	7.7	-	
Q_{rr}	Reverse Recovery Charge		-	3.9	-	nC
Dynamic Characteristics [e]						
R_G	Gate Resistance	V_{GS}=0V,V_{DS}=0V, F=1MHz	-	0.85	-	Ω
C_{iss}	Input Capacitance	V_{GS}=0V, V_{DS}=15V, Frequency=1.0MHz	-	4920	-	pF
C_{oss}	Output Capacitance		-	510	-	
C_{rss}	Reverse Transfer Capacitance		-	350	-	
$t_{d(ON)}$	Turn-on Delay Time	V_{DD}=15V, R_L=15Ω, I_{DS}=1A, V_{GEN}=10V, R_G=6Ω	-	16.6	31	ns
t_r	Turn-on Rise Time		-	12.2	23	
$t_{d(OFF)}$	Turn-off Delay Time		-	135	244	
t_f	Turn-off Fall Time		-	48	87	
Gate Charge Characteristics [e]						
Q_g	Total Gate Charge	V_{DS}=15V, V_{GS}=4.5V, I_{DS}=20A	-	47	66	nC
Q_g	Total Gate Charge	V_{DS}=15V, V_{GS}=10V, I_{DS}=20A	-	96	134	
Q_{gth}	Threshold Gate Charge		-	2.75	3.8	
Q_{gs}	Gate-Source Charge		-	5.5	7.7	
Q_{gd}	Gate-Drain Charge		-	16	22	

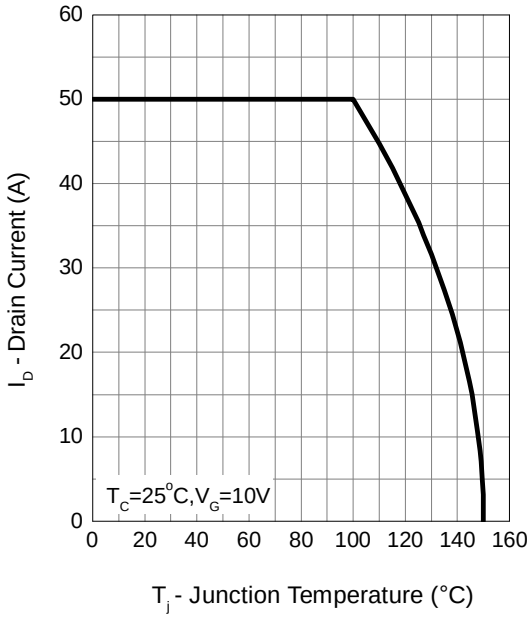
Note d：Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2%.
Note e：Guaranteed by design, not subject to production testing.

Typical Operating Characteristics

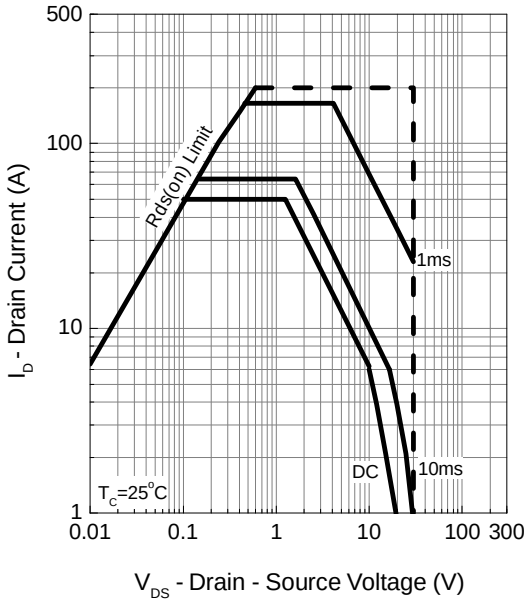
Power Dissipation



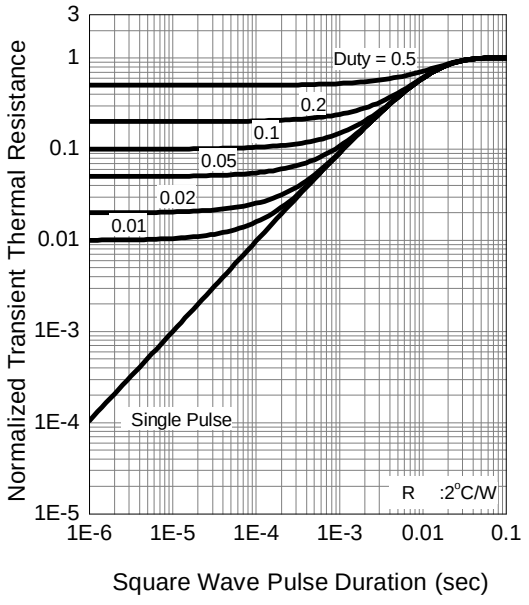
Drain Current



Safe Operation Area

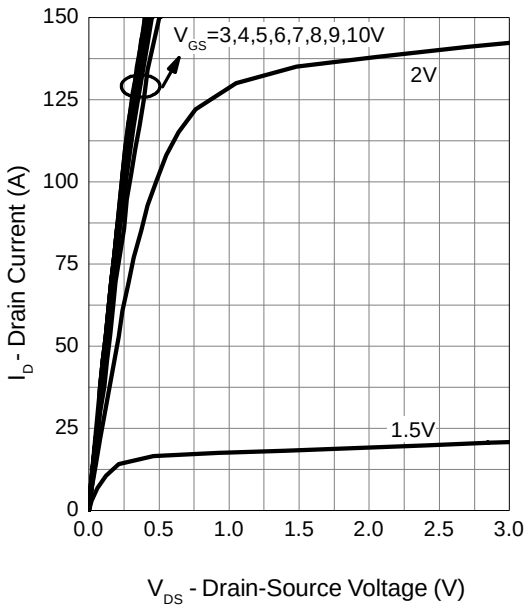


Thermal Transient Impedance

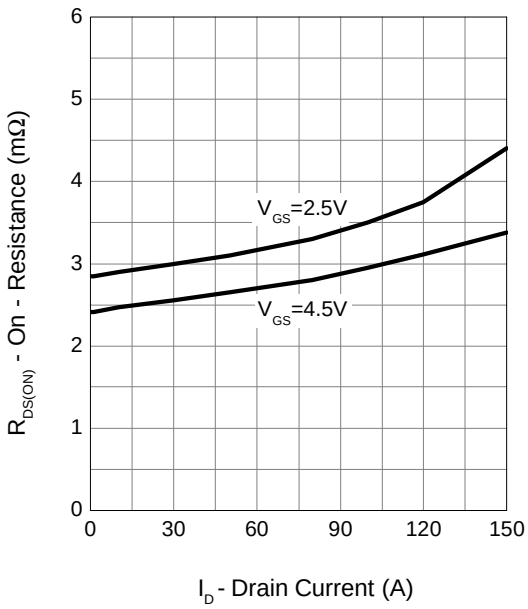


Typical Operating Characteristics (Cont.)

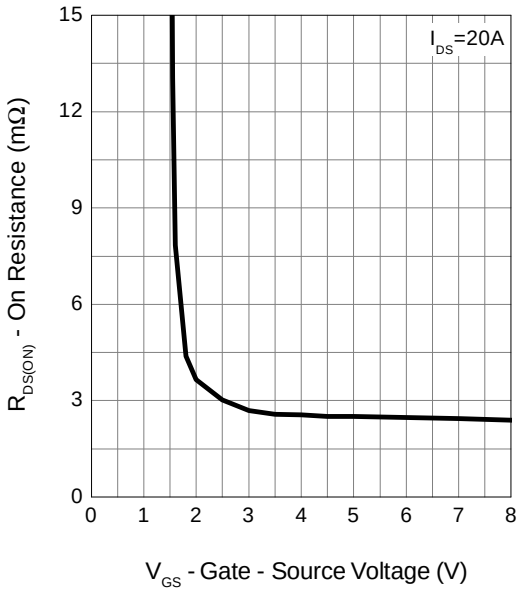
Output Characteristics



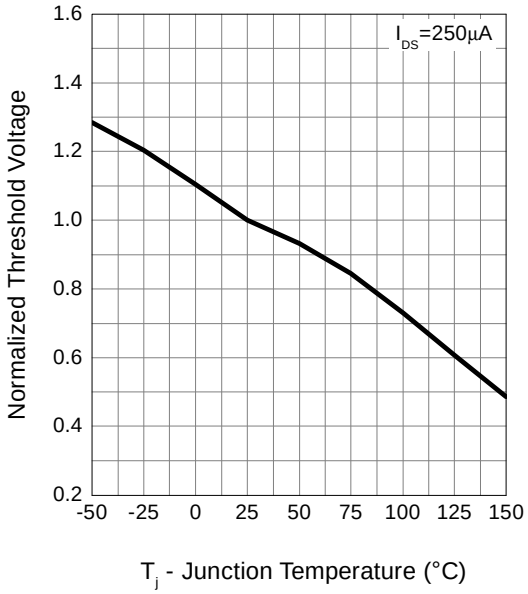
Drain-Source On Resistance



Gate-Source On Resistance

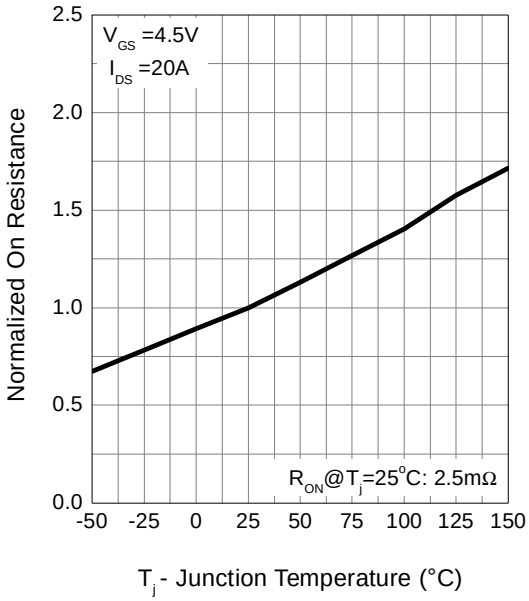


Gate Threshold Voltage

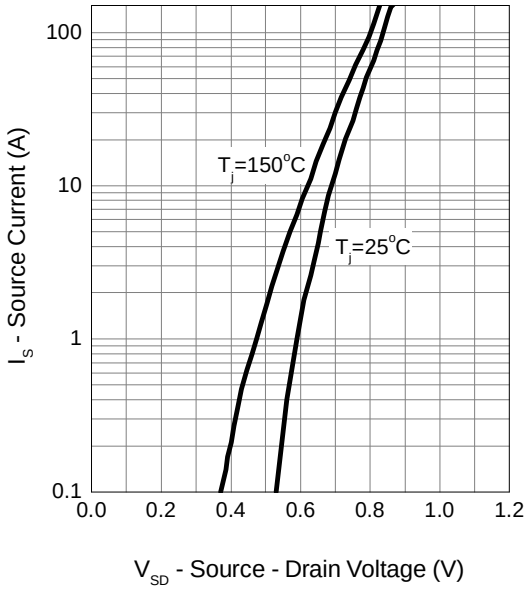


Typical Operating Characteristics (Cont.)

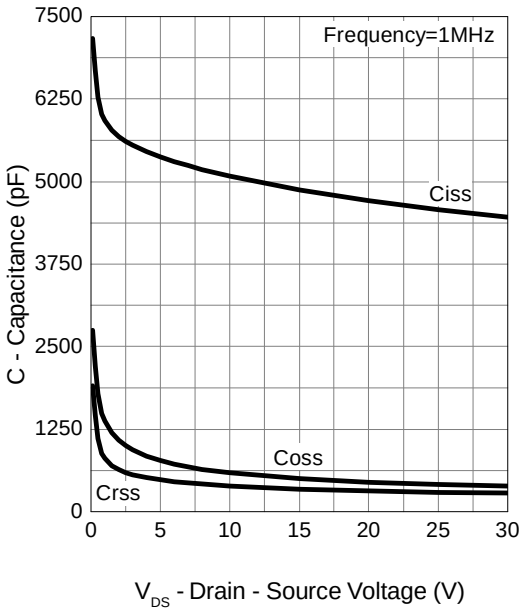
Drain-Source On Resistance



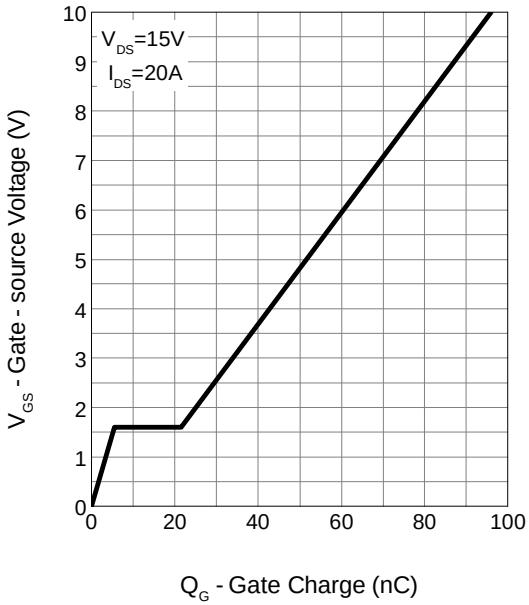
Source-Drain Diode Forward



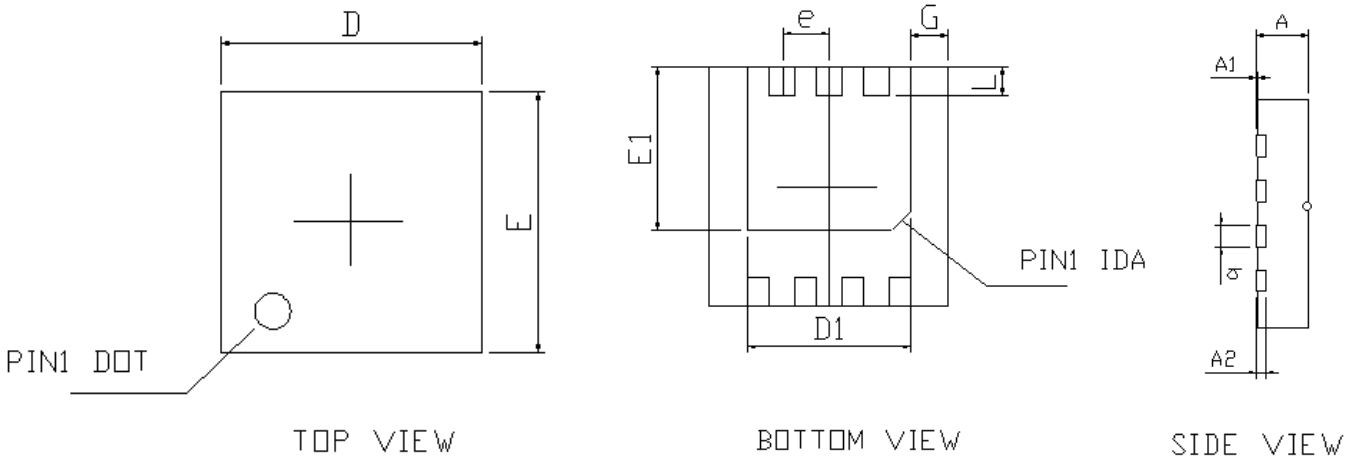
Capacitance



Gate Charge

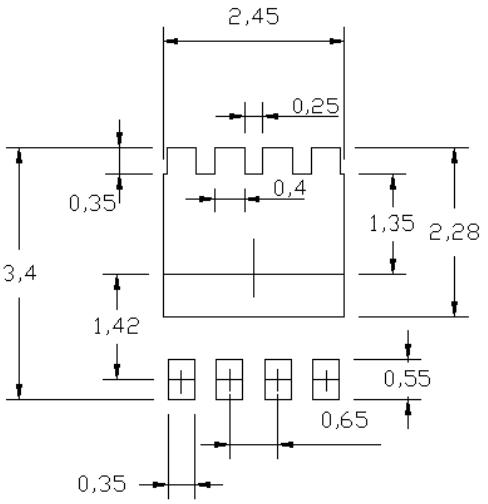


DFN3.3x3.3B-8_EP1-S

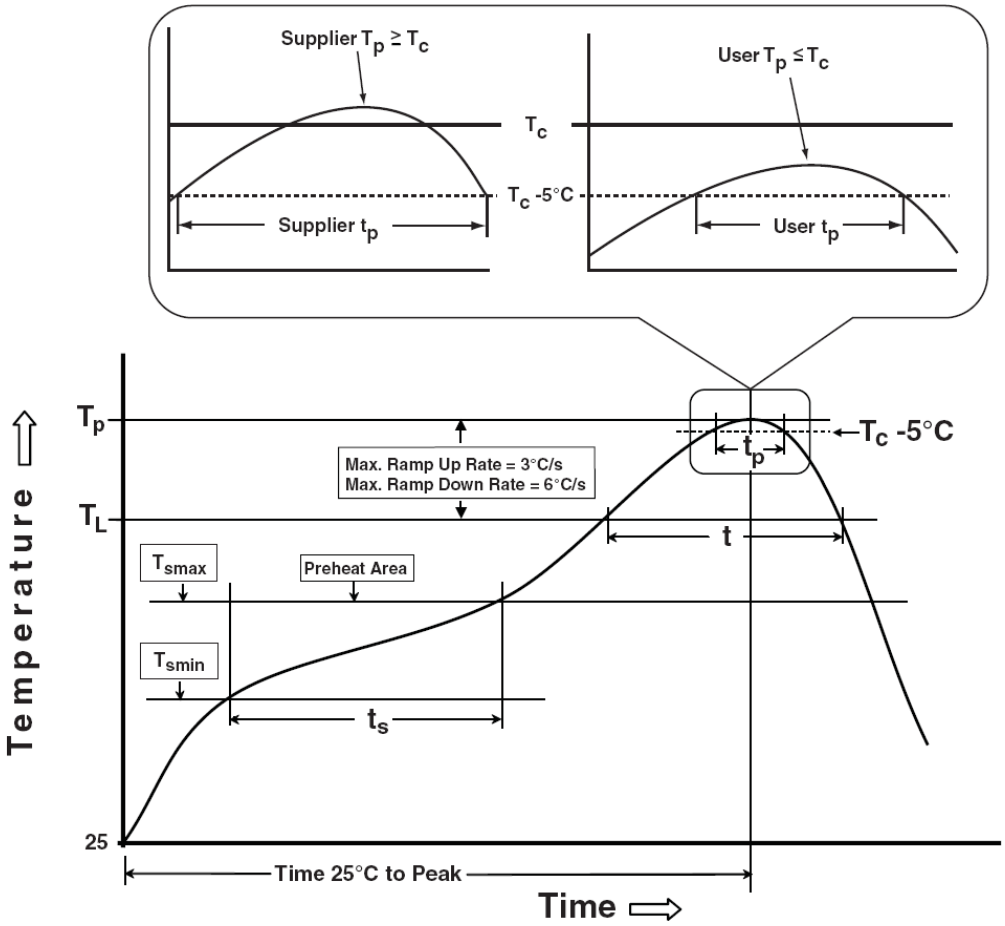


SYMBOLS	DFN3.3x3.3B-8_EP1_S			
	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	0.700	0.800	0.028	0.032
A1	0.000	0.050	0.000	0.002
A2	0.100	0.250	0.004	0.010
b	0.240	0.350	0.009	0.014
D	3.150	3.400	0.124	0.134
D1	2.100	2.350	0.083	0.093
E	3.150	3.400	0.124	0.134
E1	2.150	2.350	0.850	0.093
e	0.600	0.700	0.024	0.028
G	0.475	0.575	0.019	0.023
L	0.350	0.450	0.014	0.018

RECOMMENDED LAND PATTERN



Classification Profile



Classification Reflow Profiles

Profile Feature	Sn-Pb Eutectic Assembly	Pb-Free Assembly
Preheat & Soak Temperature min (T_{smin}) Temperature max (T_{smax}) Time (T_{smin} to T_{smax}) (t_s)	100 °C 150 °C 60-120 seconds	150 °C 200 °C 60-120 seconds
Average ramp-up rate (T_{smax} to T_P)	3 °C/second max.	3°C/second max.
Liquidous temperature (T_L) Time at liquidous (t_L)	183 °C 60-150 seconds	217 °C 60-150 seconds
Peak package body Temperature (T_p)*	See Classification Temp in table 1	See Classification Temp in table 2
Time (t_P)** within 5°C of the specified classification temperature (T_c)	20** seconds	30** seconds
Average ramp-down rate (T_p to T_{smax})	6 °C/second max.	6 °C/second max.
Time 25°C to peak temperature	6 minutes max.	8 minutes max.
* Tolerance for peak profile Temperature (T_p) is defined as a supplier minimum and a user maximum. ** Tolerance for time at peak profile temperature (t_p) is defined as a supplier minimum and a user maximum.		

Table 1. SnPb Eutectic Process – Classification Temperatures (Tc)

Package Thickness	Volume mm^3 <350	Volume mm^3 ³350
<2.5 mm	235 °C	220 °C
≥2.5 mm	220 °C	220 °C

Table 2. Pb-free Process – Classification Temperatures (Tc)

Package Thickness	Volume mm^3 <350	Volume mm^3 350-2000	Volume mm^3 >2000
<1.6 mm	260 °C	260 °C	260 °C
1.6 mm – 2.5 mm	260 °C	250 °C	245 °C
≥2.5 mm	250 °C	245 °C	245 °C

Reliability Test Program

Test item	Method	Description
SOLDERABILITY	JESD-22, B102	5 Sec, 245°C
HTRB	JESD-22, A108	1000 Hrs, 80% of VDS max @ Tjmax
HTGB	JESD-22, A108	1000 Hrs, 100% of VGS max @ Tjmax
PCT	JESD-22, A102	168 Hrs, 100%RH, 2atm, 121°C
TCT	JESD-22, A104	500 Cycles, -65°C~150°C

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