

N-Channel Enhancement Mode MOSFET

Feature

Pin Description

- 30V/100A
R_{DS(ON)} = 2.8 m (typ.) @V_{GS} = 10V
R_{DS(ON)} = 4.5m (typ.) @V_{GS} = 4.5V
- 100% Avalanche Tested
- 100% DVDS
- Reliable and Rugged
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Absolute Maximum Ratings

Symbol	Parameter	Rating	Unit	
Common Ratings (T _c =25°C Unless Otherwise Noted)				
V _{DSS}	Drain-Source Voltage	30	V	
V _{GSS}	Gate-Source Voltage	±20	V	
T _J	Junction Temperature Range	-55 to 175	°C	
T _{STG}	Storage Temperature Range		°C	
I _S	Source Current-Continuous(Body Diode)	T _c =25°C	100	A
Mounted on Large Heat Sink				
I _{DM}	Pulsed Drain Current *	T _c =25°C	360	A
I _D	Continuous Drain Current	T _c =25°C	100	A
		T _c =100°C	70	A
P _D	Maximum Power Dissipation	T _c =25°C	77	W
		T _c =100°C	38	W
R _{JC}	Thermal Resistance, Junction-to-Case		1.94	°C/W
R _{JA}	Thermal Resistance, Junction-to-Ambient **		80	°C/W
E _{AS}	Single Pulsed-Avalanche Energy ***	L=0.3mH	105	mJ

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

** Surface mounted on 1in2 FR-4 board.

*** Limited by T_{Jmax}, starting T_J=25°C, L = 0.3mH, R_G= 25 Ω, V_{GS}=10V.

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

Symbol	Parameter	Test Conditions	HYG026N03LS1			Unit
			Min	Typ.	Max	
Static Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _{DS} =250μA	30	-	-	V
I _{DSS}	Drain-to-Source Leakage Current	V _{DS} =30V, V _{GS} =0V	-	-	1	μA
		T _J =125°C	-	-	50	μA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _{DS} =250μA	1.0	1.8	3.0	V
I _{GSS}	Gate-Source Leakage Current	V _{GS} =±20V, V _{DS} =0V	-	-	±100	nA
R _{DS(ON)}	Drain-Source On-State Resistance	V _{GS} =10V, I _{DS} =20A	-	2.8	3.5	m
		V _{GS} =4.5V, I _{DS} =20A		4.5	5.6	m
Diode Characteristics						
V _{SD}	Diode Forward Voltage	I _{SD} =20A, V _{GS} =0V	-	0.81	1.2	V
t _{rr}	Reverse Recovery Time	I _{SD} =20A, dI _{SD} /dt=100A/μs	-	16.5	-	ns
Q _{rr}	Reverse Recovery Charge		-	6.5	-	nC

Electrical Characteristics (Cont.) (Tc =25°C Unless Otherwise Noted)

Symbol	Parameter	Test Conditions	HYG026N03LS1			Unit
			Min	Typ.	Max	
Dynamic Characteristics						
R _G	Gate Resistance	V _{GS} =0V, V _{DS} =0V, F=1MHz	-	3.0	-	
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =25V, Frequency=1MHz	-	1532	-	pF
C _{oss}	Output Capacitance		-	318	-	
C _{rss}	Reverse Transfer Capacitance		-	27	-	
t _{d(ON)}	Turn-on Delay Time					

Typical Operating Characteristics

Figure 1: Power Dissipation

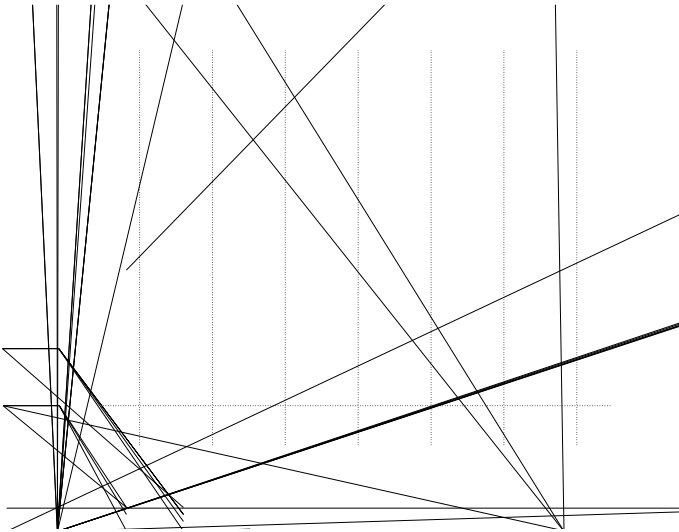


Figure 2: Drain Current



Figure 3: Safe Operation Area

Figure 4: Thermal Transient Impedance

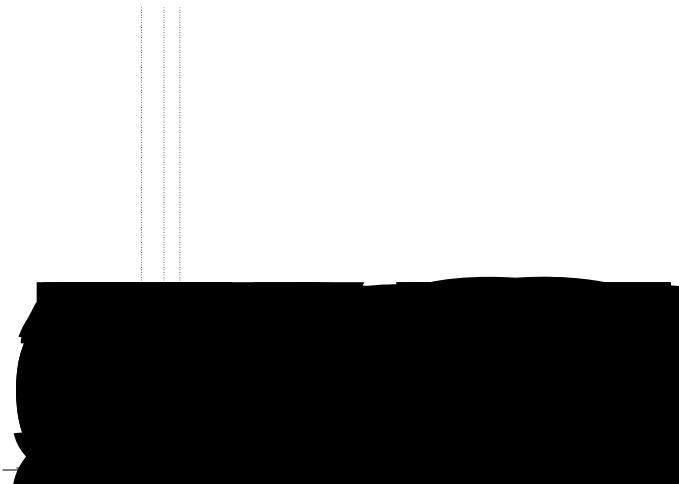


Figure 5: Output Characteristics

Figure 6: Drain-Source On Resistance



Typical Operating Characteristics(Cont.)

Figure 7: On-Resistance vs. Temperature

Figure 8: Source-Drain Diode Forward

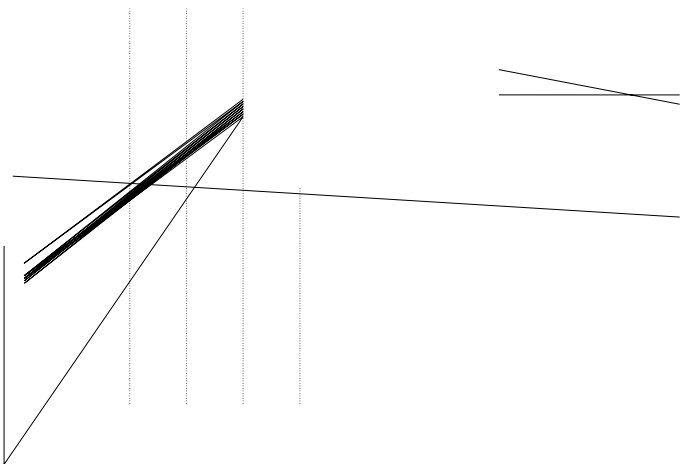
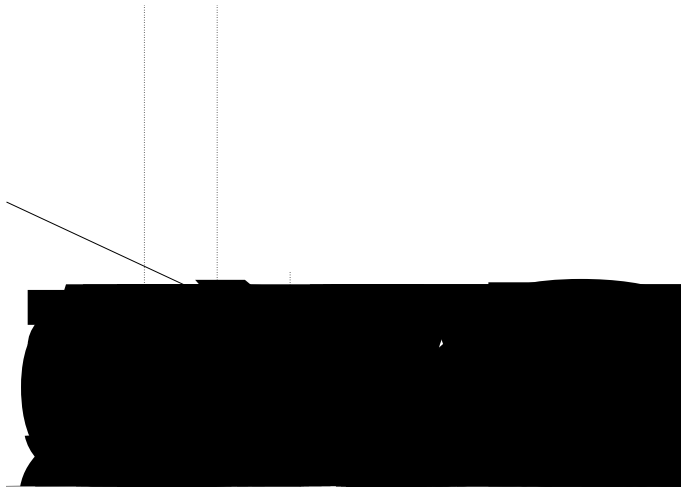
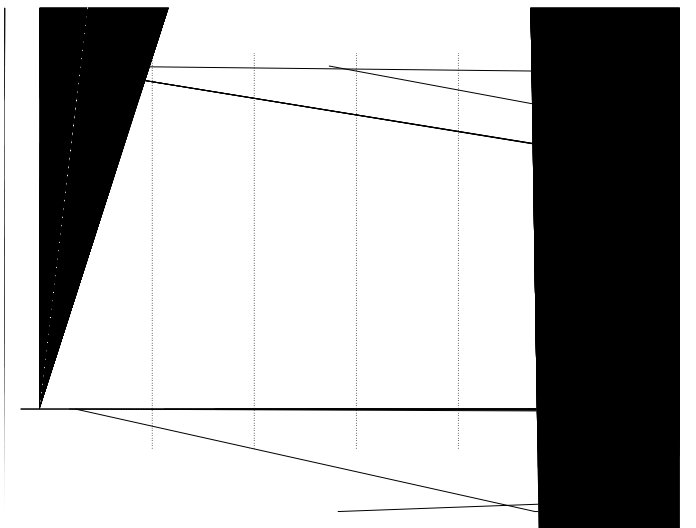
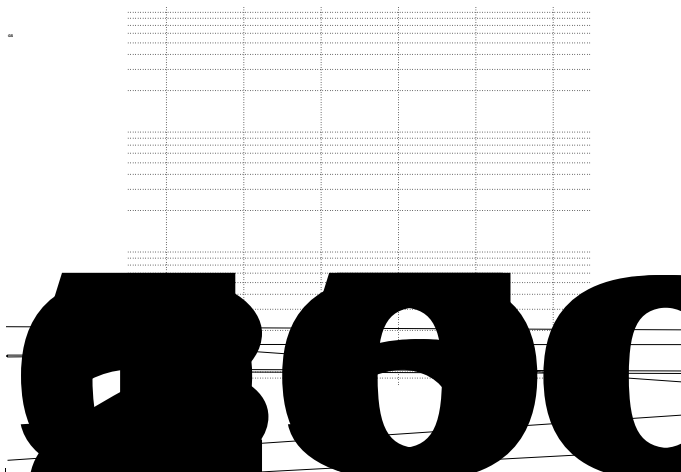
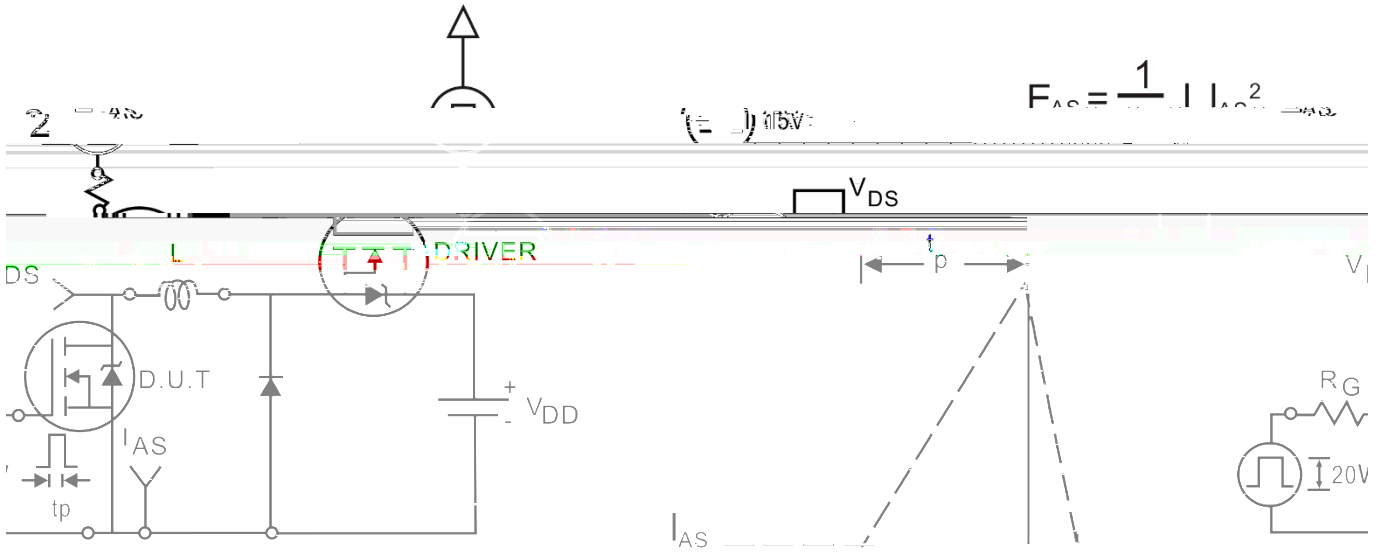


Figure 9: Capacitance Characteristics

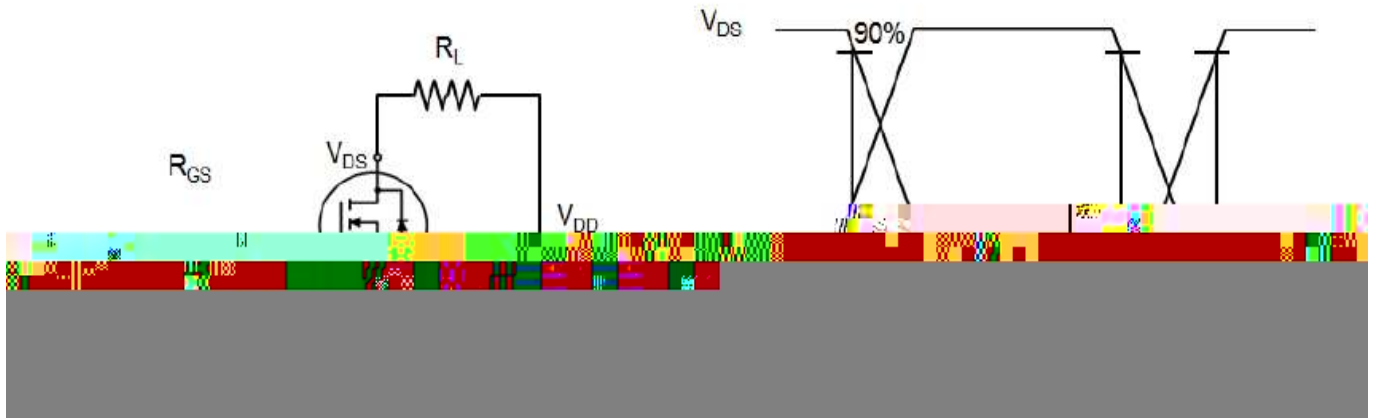
Figure 10: Gate Charge Characteristics



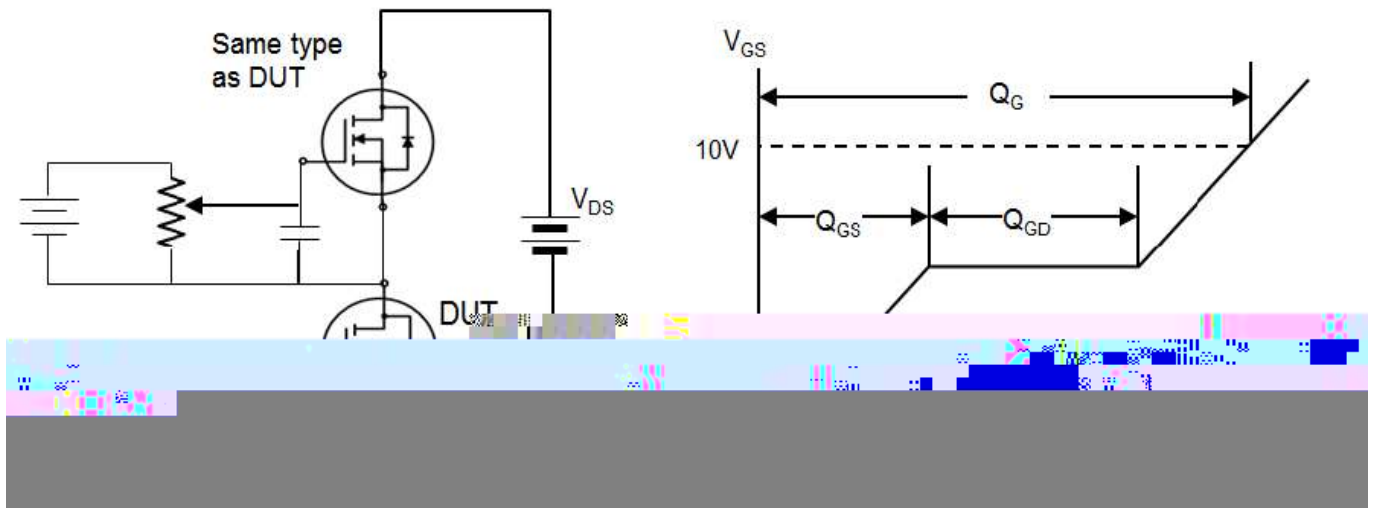
Avalanche Test Circuit



Switching Time Test Circuit



Gate Charge Test Circuit

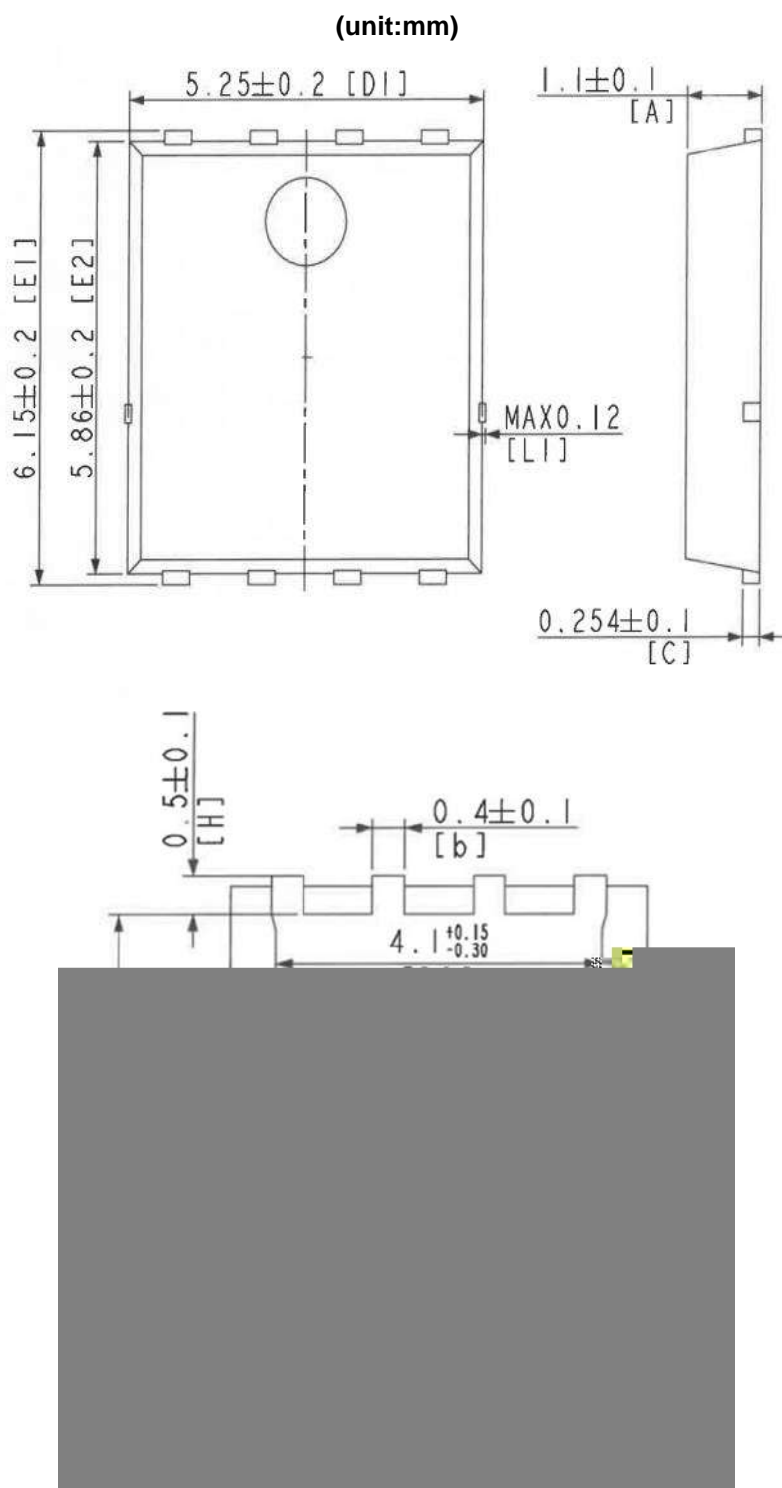


Device Per Unit

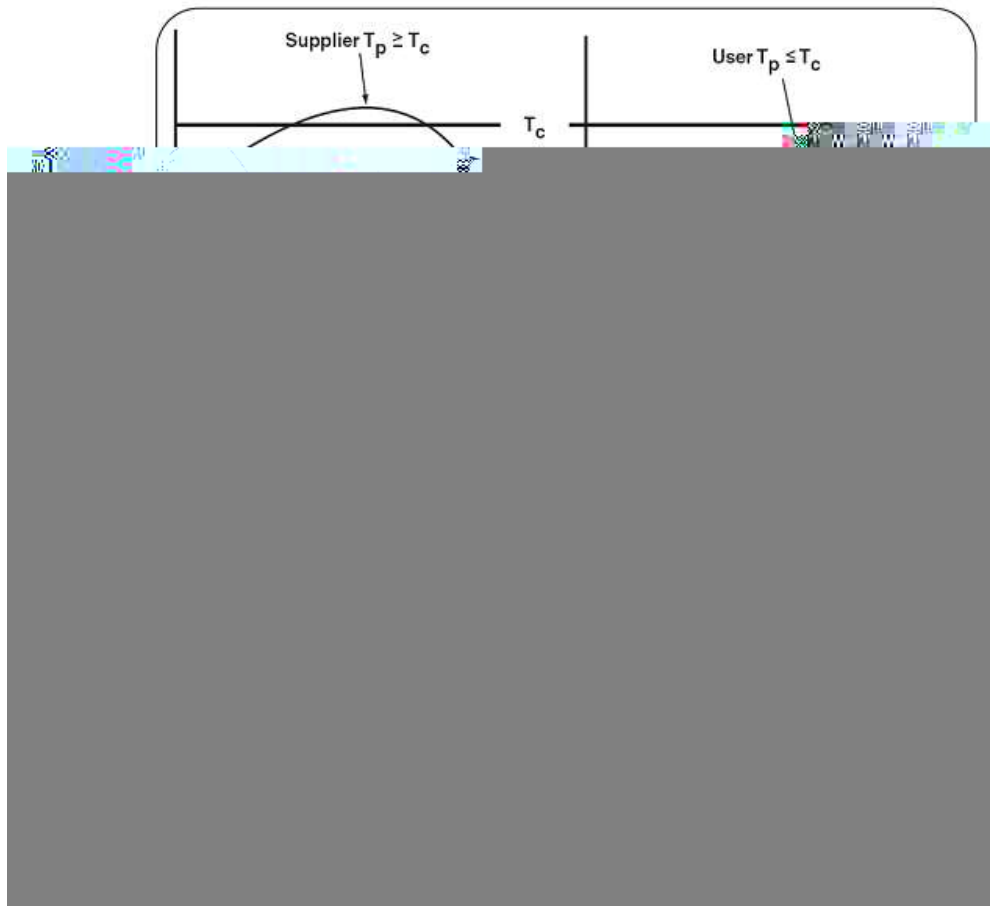
Package Type	Unit	Quantity
PDFN8L(5x6)	Reel	5000

Package Information

PDFN8L(5x6)



Classification Profile



Classification Reflow Profiles

Profile Feature	Sn-Pb Eutectic Assembly	Pb-Free Assembly
Preheat & Soak		
Temperature min (T_{smin})	100 °C	150 °C
Temperature max (T_{smax})	150 °C	200 °C
Time (T_{smin} to T_{smax}) (t_s)	60-120 seconds	60-120 seconds
Average ramp-up rate (T_{smax} to T_P)	3 °C/second max.	3°C/second max.
Liquidous temperature (T_L)	183 °C	217 °C
Time at liquidous (t_L)	60-150 seconds	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 ≥350
<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	168/500 Hrs, Bias @ 150°C
HTGB	JESD-22, A108	168 /500 Hrs, V _{gs} 100% @ 150°C
PCT	JESD-22, A102	96 Hrs, 100%RH, 2atm, 121°C
TCT	JESD-22, A104	250/500 Cycles, -55°C~150°C

Customer Service

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