

Absolute Maximum Ratings

Symbol	Parameter		Rating	Unit
Common Ratings (Tc=25°C Unless Otherwise Noted)				
V _{DSS}	Drain-Source Voltage		80	V
V _{GSS}	Gate-Source Voltage		20	V
T _J	Junction Temperature Range		-55 to 175	°C
T _{STG}	Storage Temperature Range		-55 to 175	°C
I _S	Source Current-Continuous(Body Diode)	Tc=25°C	85	A
Mounted on Large Heat Sink				
I _{DM}	Pulsed Drain Current *	Tc=25°C	**400	A
I _D	Continuous Drain Current	Tc=25°C	85	A
		Tc=100°C	60	A
P _D	Maximum Power Dissipation	Tc=25°C	83.3	W
		Tc=100°C	41.7	W
R _{θJC}	Thermal Resistance, Junction-to-Case		1.8	°C/W
R _{θJA}	Thermal Resistance, Junction-to-Ambient **		45	°C/W
E _{AS}	SinglePulsed-Avalanche Energy ***	L=0.3mH	350***	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= 25Ω, V_{GS}=10V.

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

Symbol	Parameter	Test Conditions	HYG055N08NS1			Unit
			Min	Typ.	Max	
Static Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _{DS} = 250 A	80	-	-	V
I _{DSS}	Drain-to-Source Leakage Current	V _{DS} = 80V, V _{GS} =0V	-	-	1	A
		T _J =125°C	-	-	50	A
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _{DS} = 250 A	2	3	4	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	-	4.8	6.0	mΩ
Diode Characteristics						
V _{SD}	Diode Forward Voltage	I _{SD} =20A, V _{GS} =0V	-	0.92	1.2	V
t _{rr}	Reverse Recovery Time	I _{SD} =50A, dI _{SD} /dt=100A/	-	57	-	ns
Q _{rr}	Reverse Recovery Charge		-	98	-	nC

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

Symbol	Parameter	Test Condition	HYG055N08NS1			Unit
			Min	Typ.	Max	
Dynamic Characteristics						
R _G	Gate Resistance	V _{DS} =0V, V _{GS} =0V, I _{DS} =50A	-	3	-	Ω
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =0V, f=1MHz	-	3660	-	pF
C _{oss}	Output Capacitance	V _{GS} =0V, V _{DS} =5V, f=1MHz	-	1540	-	
C _{rss}	Reverse Transfer Capacitance	V _{GS} =0V, V _{DS} =5V, Frequency=1.0MHz	-	15	-	
t _{d(ON)}	Turn-on Delay Time	V _{DD} =48V, I _{DS} =50A, V _{GS} =10V	-	16	-	ns
T _r	Turn-on Rise Time		-	89	-	
t _{d(OFF)}	Turn-off Delay Time		-	44	-	
T _f	Turn-off Fall Time		-	93	-	
Gate Charge Characteristics						
Q _g						

Typical Operating Characteristics

Figure 1: Power Dissipation

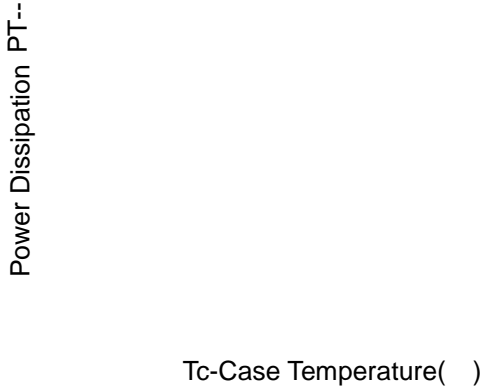


Figure 2: Drain Current

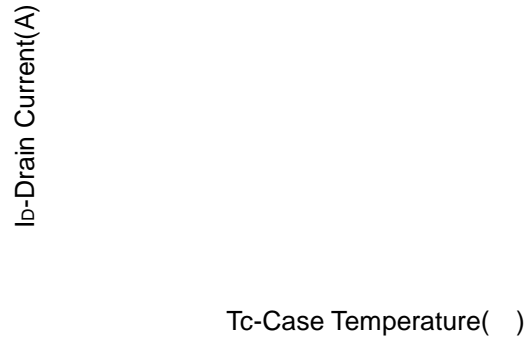


Figure 3: Safe Operation Area

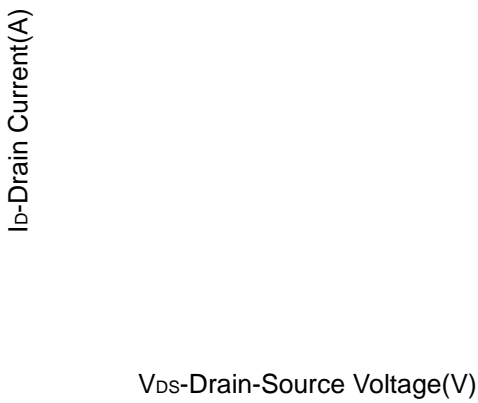


Figure 4: Thermal Transient Impedance

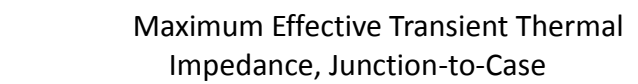


Figure 5: Output Characteristics

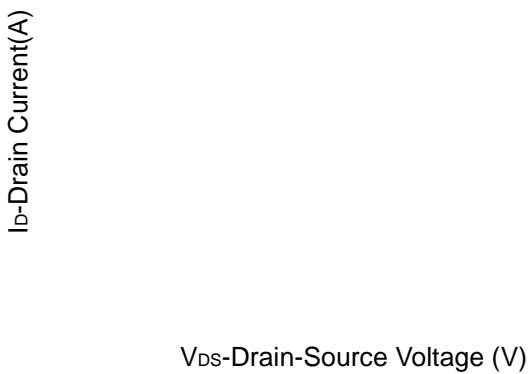
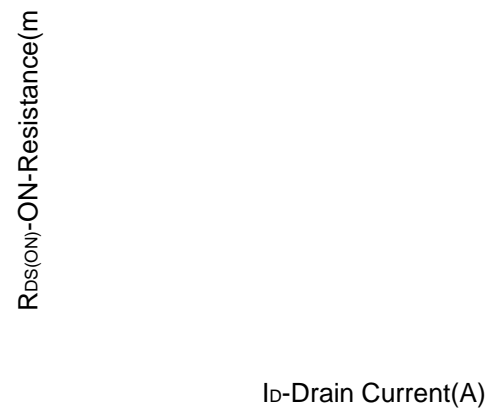


Figure 6: Drain-Source On Resistance



Typical Operating Characteristics(Cont.)

Figure 7: On-Resistance vs. Temperature

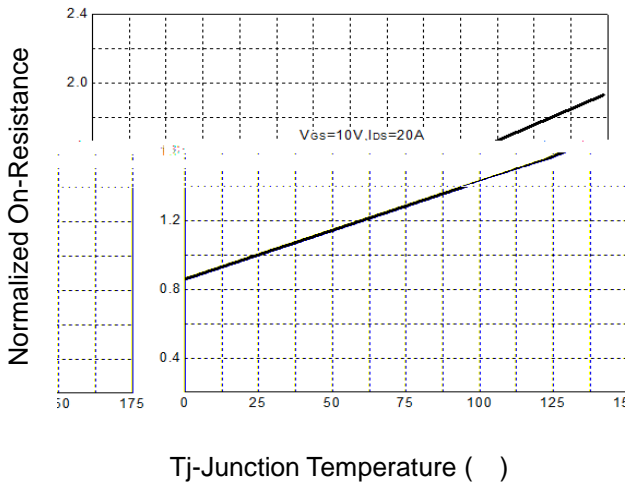


Figure 8: Source-Drain Diode Forward

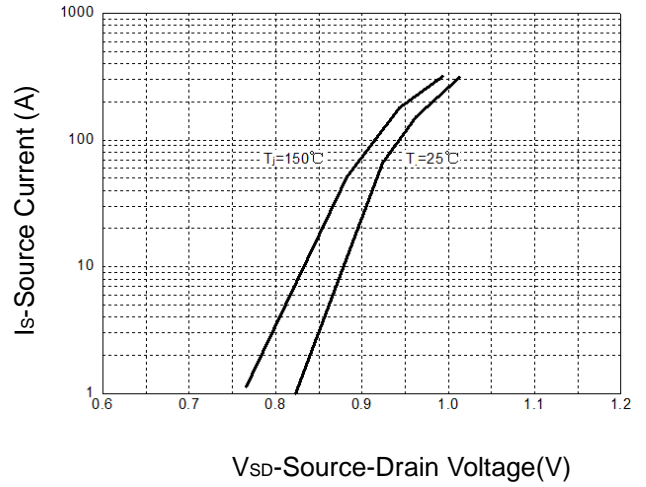


Figure 9: Capacitance Characteristics

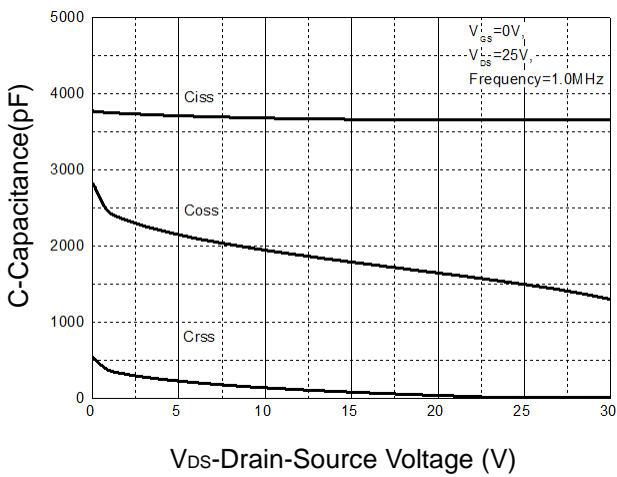
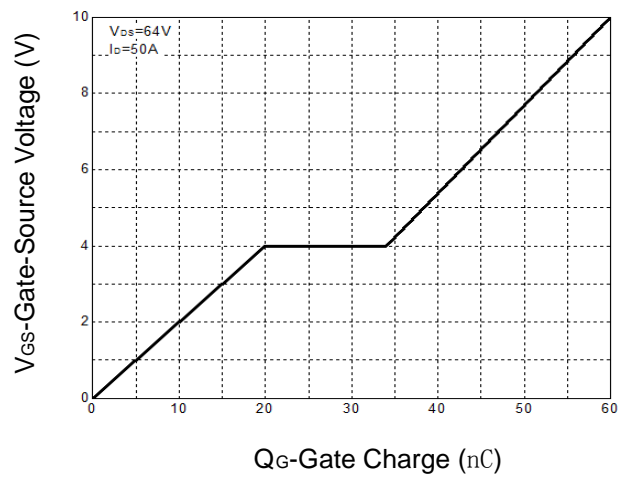
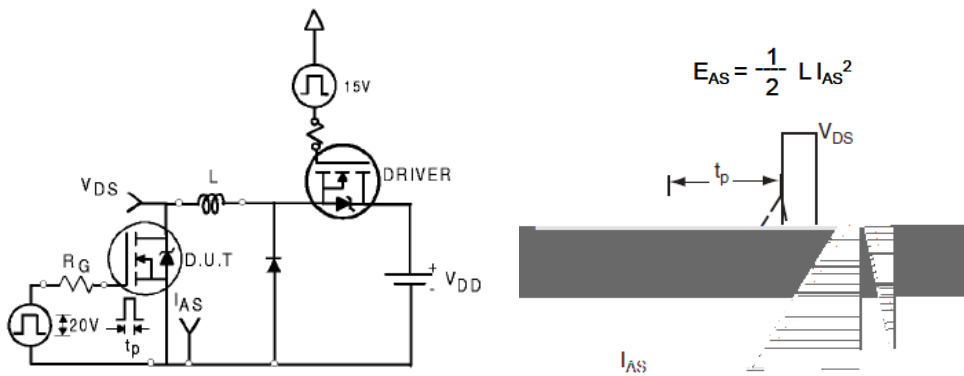


Figure 10: Gate Charge Characteristics

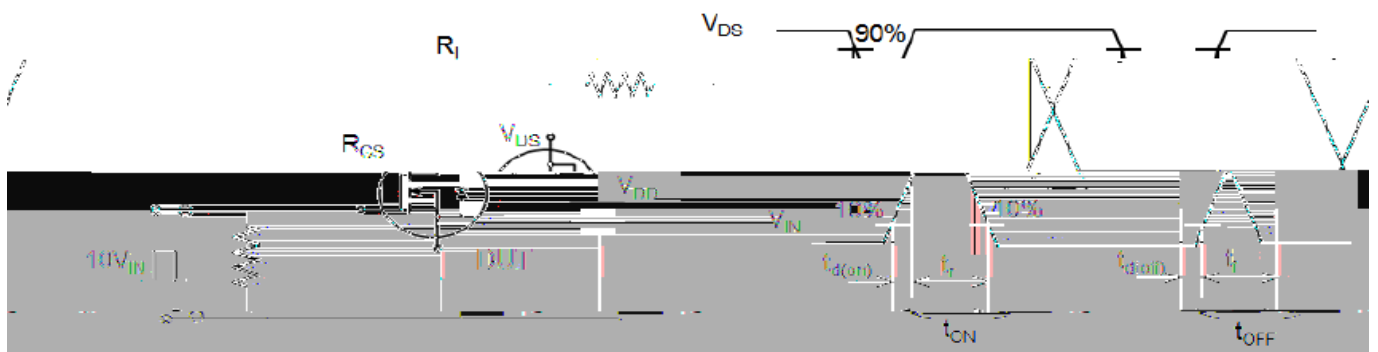


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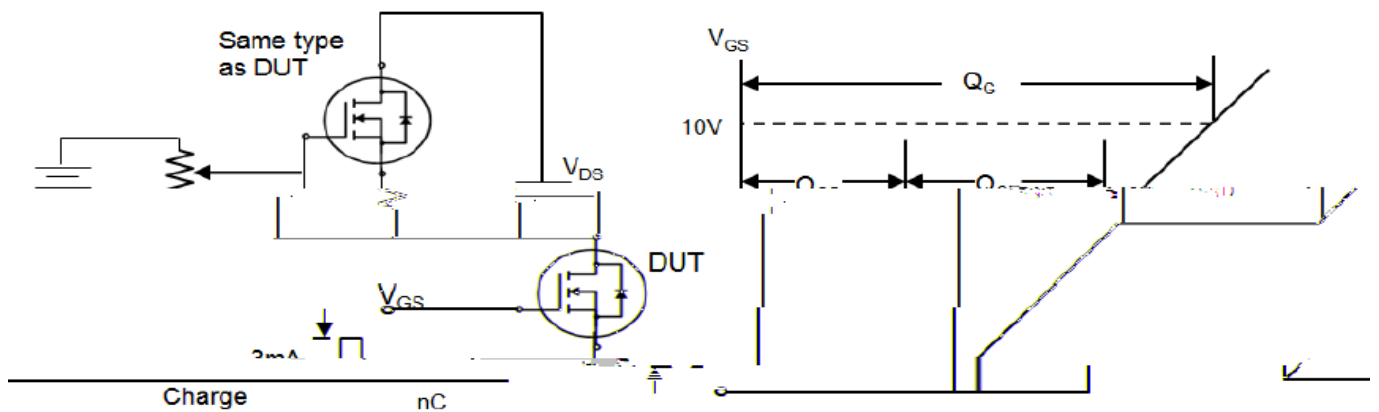
Avalanche Test Circuit



Switching Time Test Circuit



Gate Charge Test Circuit



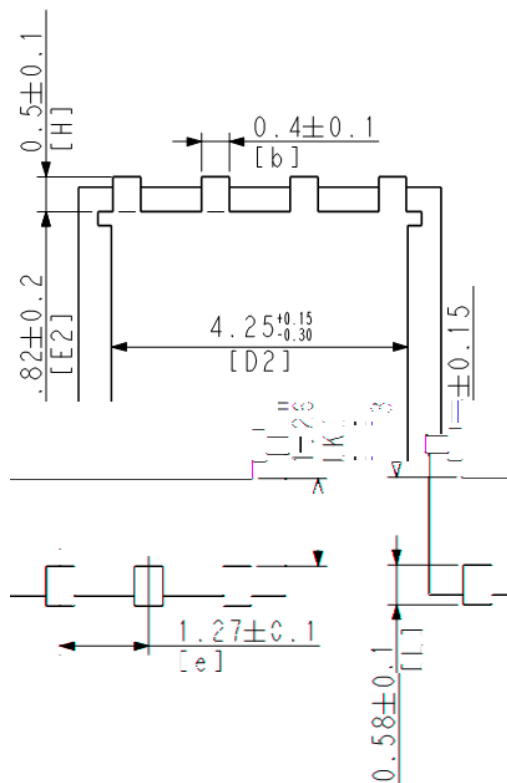
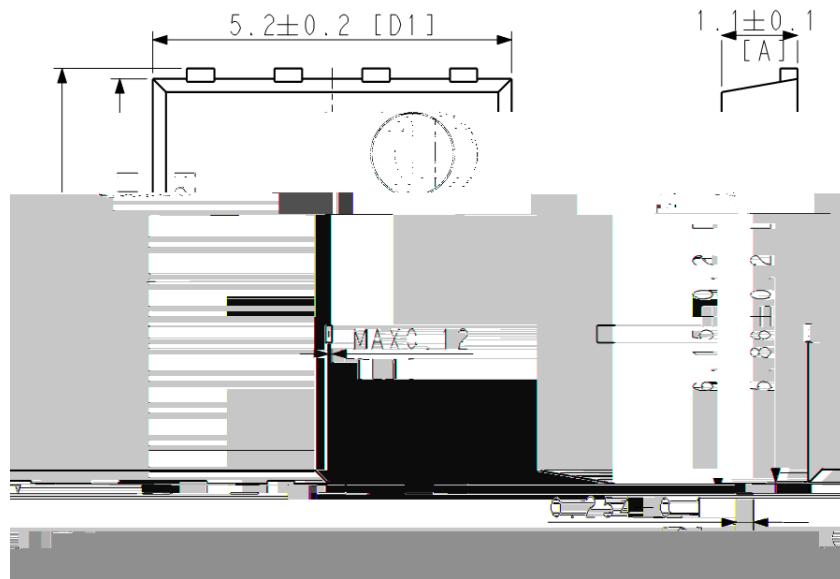
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Device Per Unit

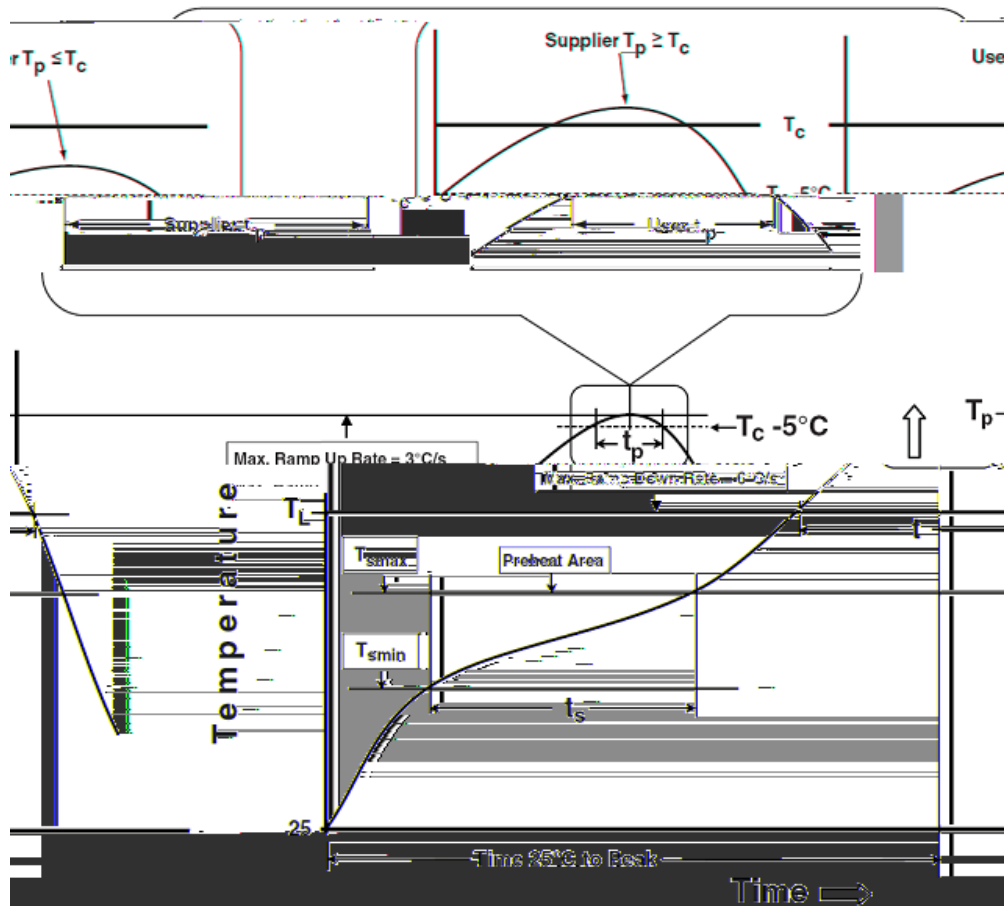
Package Type	Unit	Quantity
PPAK5*6-8L	Reel	5000

Package Information

PPAK5*6-8L



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.

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Table 1. SnPb Eutectic Process Classification Temperatures (Tc)

Package Thickness	Volume mm <350	Volume mm 350
2.5 mm	235 °C	220 °C