

HYG065N07NS1C2

N-Channel Enhancement Mode MOSFET

Feature

Pin Description

- 70V/70A
 $R_{DS(ON)}$

PDFN5*6 8L

PDFN5*6

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Absolute Maximum Ratings

Symbol	Parameter		Rating	Unit
Common Ratings (Tc=25°C Unless Otherwise Noted)				
V _{DSS}	Drain-Source Voltage		70	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	70	A
Mounted on Large Heat Sink				
I _{DM}	Pulsed Drain Current *	Tc=25°C	300	A
I _D	Continuous Drain Current	Tc=25°C	70	A
		Tc=100°C	49.5	A
P _D	Maximum Power Dissipation	Tc=25°C	57.7	W
		Tc=100°C	28.8	W
R _{θJC}	Thermal Resistance, Junction-to-Case		2.6	°C/W
R _{θJA}	Thermal Resistance, Junction-to-Ambient **		45	°C/W
E _{AS}	SinglePulsed-Avalanche Energy ***	L=0.3mH	214	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	HYG065N07NS1			Unit
			Min	Typ.	Max	
Static Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _{DS} = 250 A	70	-	-	V
I _{DSS}	Drain-to-Source Leakage Current	V _{DS} = 70V, 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	-	5.3	6.5	mΩ
Diode Characteristics						
V _{SD}	Diode Forward Voltage	I _{SD} =20A, V _{GS} =0V				5

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

Symbol	Parameter	Test Conditions	HYG065N07NS1			Unit
			Min	Typ.	Max	
Dynamic Characteristics						
R _G	Gate Resistance	V _{GS} =0V, V _{DS} =0V, F=1MHz	-	3.5	-	Ω
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} = 25V, Frequency=1.0MHz	-	3070	-	pF
C _{oss}	Output Capacitance					
C _{rss}	Reverse Transfer Capacitance					
t _{d(ON)}	Turn-on Delay Time	V _{DD} = 35V, R _G =4.0 I _{DS} = 40A, V _{GS} = 10V	-	15	-	ns
T _r	Turn-on Rise Time					
t _{d(OFF)}	Turn-off Delay Time					
T _f	Turn-off Fall Time					
Gate Charge Characteristics						
Q _g	Total Gate Charge	V _{DS} = 56V, V _{GS} = 10V, I _{DS} = 20A	-	52	-	nC
Q _{gs}	Gate-Source Charge					
Q _{gd}	Gate-Drain Charge					

Note: *Pulse test pulse width 300us duty cycle 2%

Typical Operating Characteristics

Figure 1: Power Dissipation

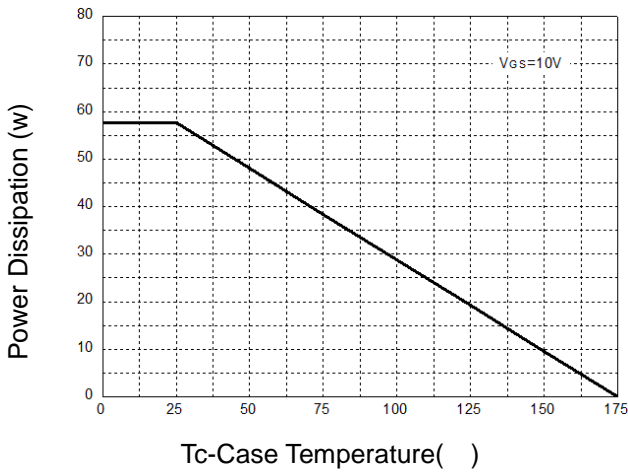


Figure 2: Drain Current

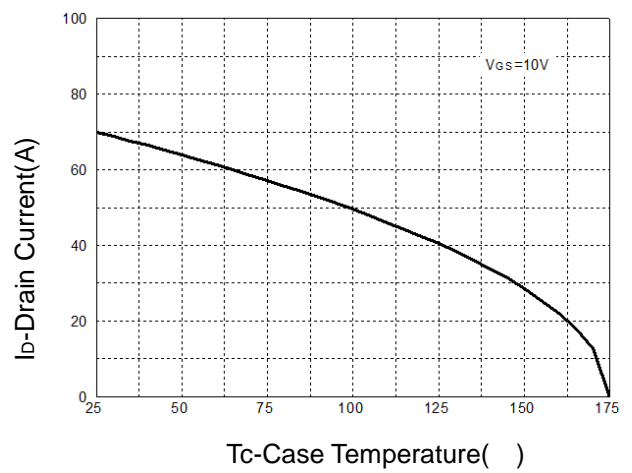


Figure 3: Safe Operation Area

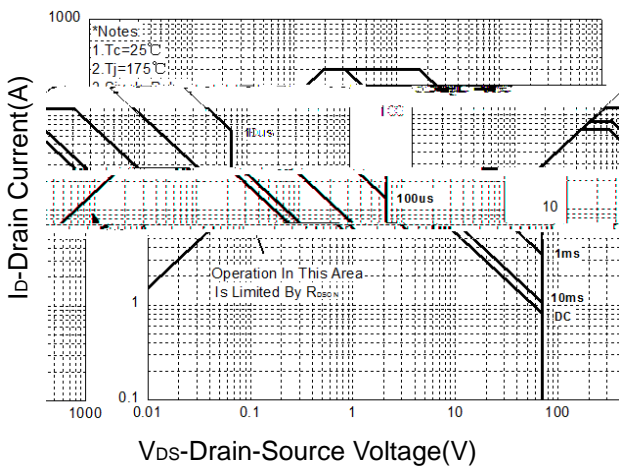


Figure 4: Thermal Transient Impedance

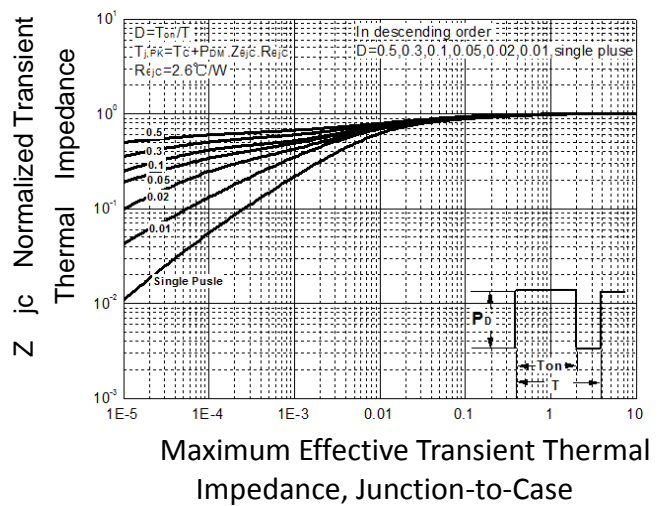


Figure 5: Output Characteristics

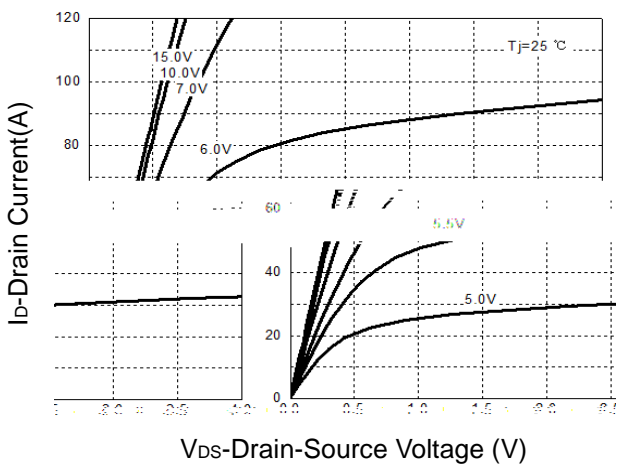
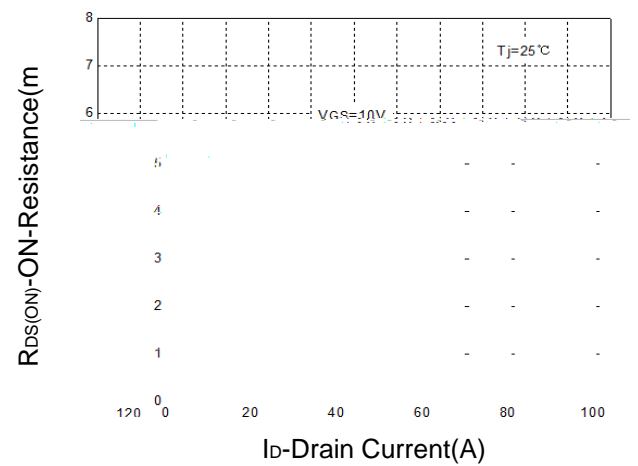


Figure 6: Drain-Source On Resistance



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Typical Operating Characteristics(Cont.)

Figure 7: On-Resistance vs. Temperature

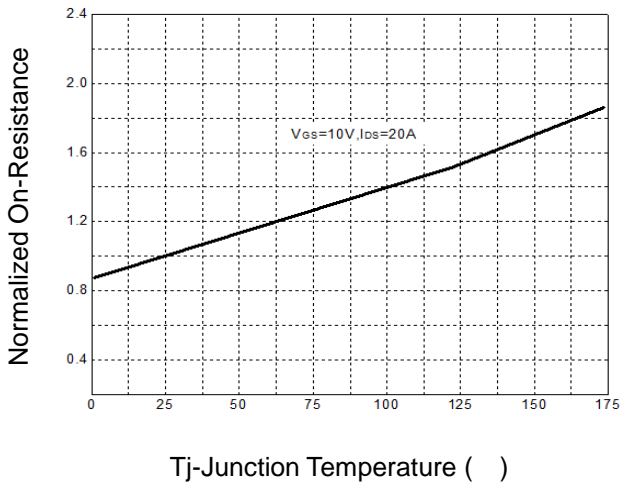


Figure 8: Source-Drain Diode Forward

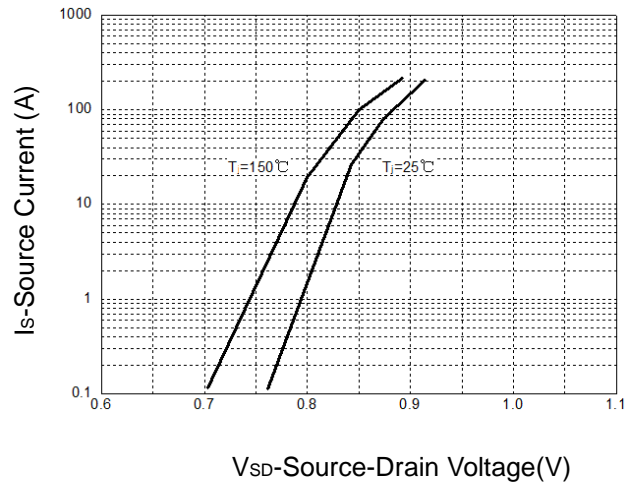


Figure 9: Capacitance Characteristics

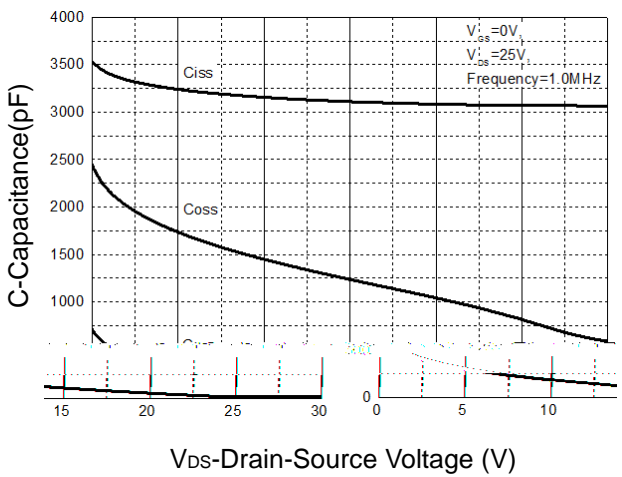
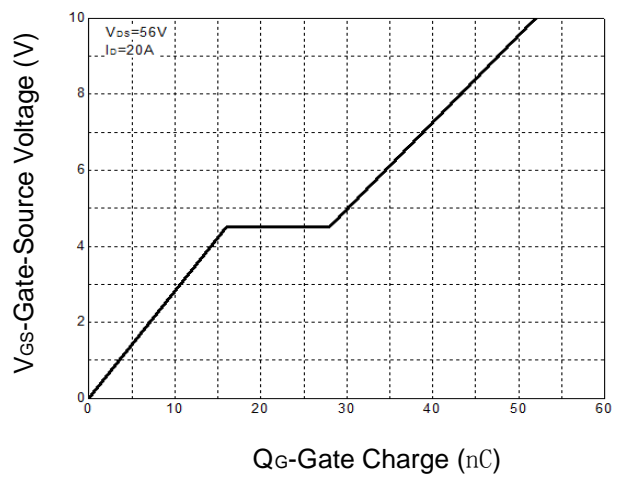
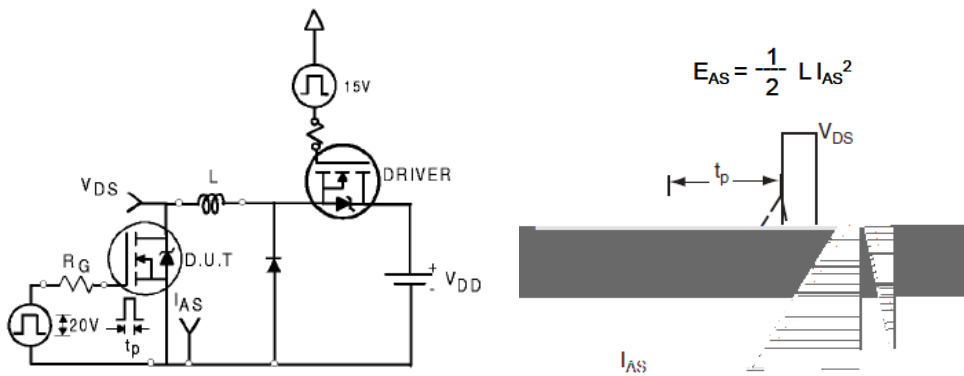


Figure 10: Gate Charge Characteristics

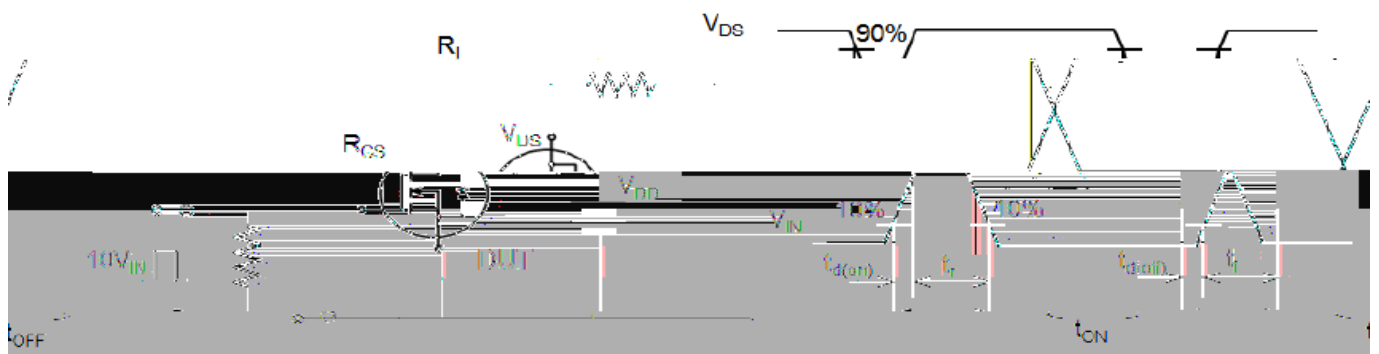


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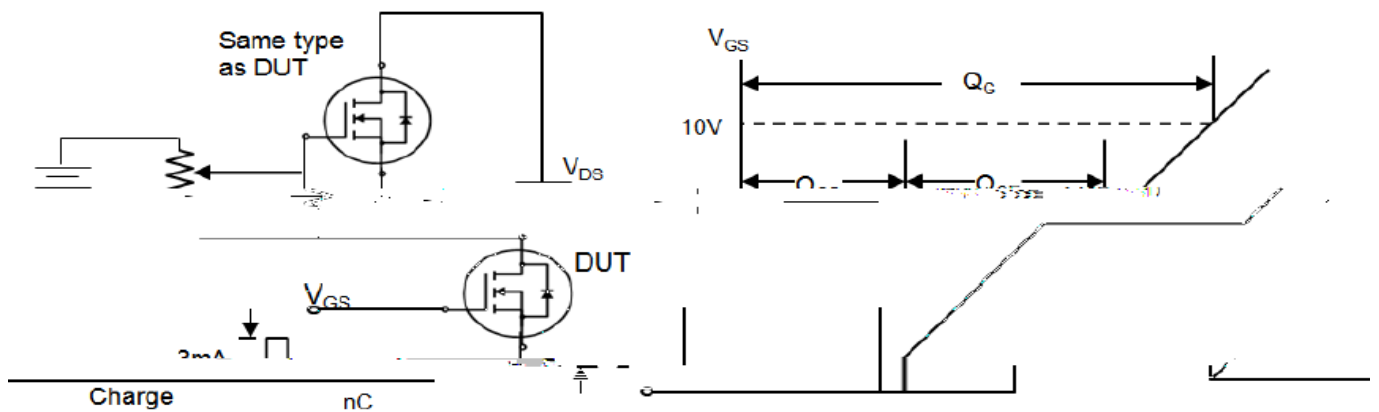
Avalanche Test Circuit



Switching Time Test Circuit



Gate Charge Test Circuit



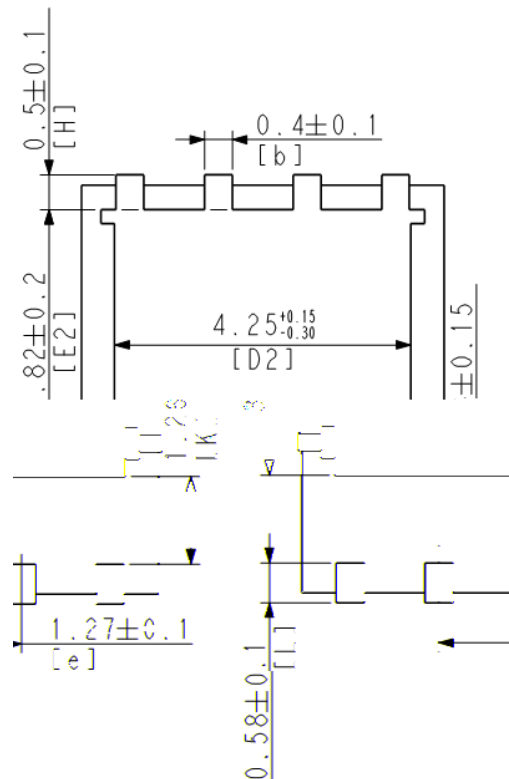
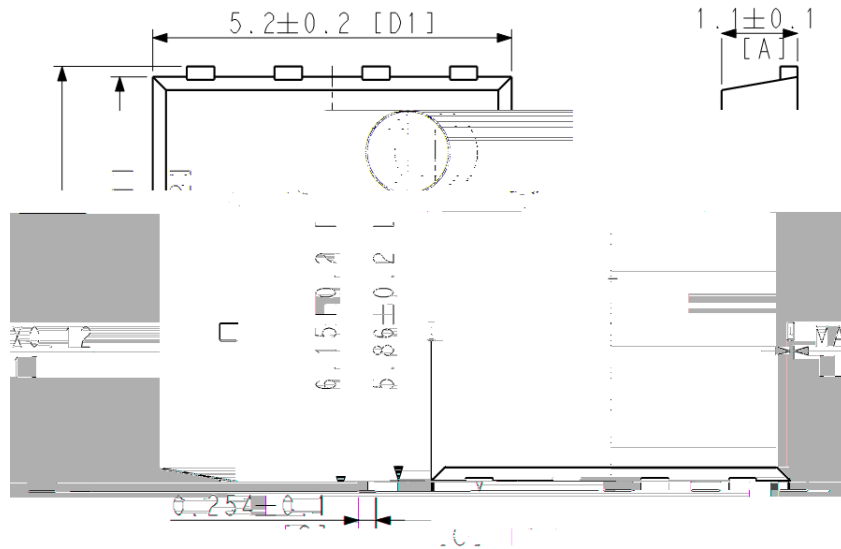
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Device Per Unit

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

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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
	220 °C	220 °C

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

Package Thickness	Volume mm <350	Volume mm 350-2000	Volume mm 2000
<1.6 mm	260 °C	260 °C	260 °C
1.6 mm 2.5 mm	260 °C	250 °C	245 °C 1.6Ø