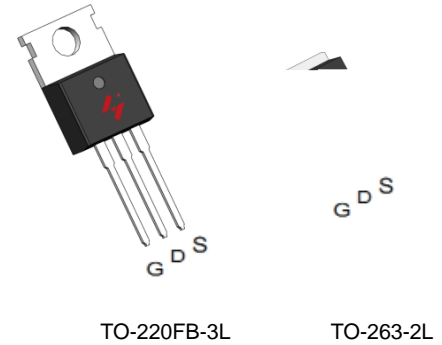


## N-Channel Enhancement Mode MOSFET

### Feature

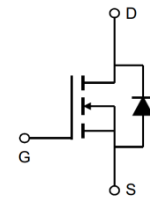
- 70V/100A
- $R_{DS(ON)}=5.5\ m\ (typ.)@V_{GS} = 10V$
- 100% Avalanche Tested
- Reliable and Rugged
- Lead-Free and Green Devices Available (RoHS Compliant)

### Pin Description





### Applications

- Switching application
- Power management for inverter systems
- Motor control



N-Channel MOSFET

### Ordering and Marking Information

 <b>P</b> <b>G065N07</b> XYMXXXXXX	 <b>B</b> <b>G065N07</b> XYMXXXXXX	Package Code P : TO-220FB-3L      B : TO-263-2L  Date Code XYMXXXXXX
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Note: HUAYI lead-free products contain molding compounds/die attach materials and 100% matte tin plate Termination finish; which are fully compliant with RoHS. HUAYI lead-free products meet or exceed the lead-free requirements of IPC/JEDEC J-STD-020 for MSL classification at lead-free peak reflow temperature. HUAYI defines “Green” to mean lead-free (RoHS compliant) and halogen free (Br or Cl does not exceed 900ppm by weight in homogeneous material and total of Br and Cl does not exceed 1500ppm by weight).

HUAYI reserves the right to make changes, corrections, enhancements, modifications, and improvements to this product and/or to this document at any time without notice.

# HYG065N07NS1P/B

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## Absolute Maximum Ratings

Symbol	Parameter	Rating	Unit
<b>Common Ratings</b> (Tc=25°C Unless Otherwise Noted)			
V <sub>DSS</sub>	Drain-Source Voltage	70	V
V <sub>GSS</sub>	Gate-Source Voltage	20	V
T <sub>J</sub>	Junction Temperature Range	-55 to 175	°C
T <sub>STG</sub>	Storage Temperature Range	-55 to 175	°C
I <sub>S</sub>	Source Current-Continuous(Body Diode)	Tc=25°C 100	A

**Mounted on Large Heat Sink**

# HYG065N07NS1P/B

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

Symbol	Parameter	Test Conditions	HYG065N07NS1			Unit
			Min	Typ.	Max	
<b>Dynamic Characteristics</b>						
R <sub>G</sub>	Gate Resistance	V <sub>GS</sub> =0V, V <sub>DS</sub> =0V, F=1MHz	-	3.3	-	
C <sub>iss</sub>	Input Capacitance	V <sub>GS</sub> =0V, V <sub>DS</sub> = 25V, Frequency=1.0MHz	-	2990	-	pF
C <sub>oss</sub>	Output Capacitance		-	910	-	
C <sub>rss</sub>	Reverse Transfer Capacitance		-	26	-	
t <sub>d(ON)</sub>	Turn-on Delay Time	V <sub>DD</sub> = 35V, R <sub>G</sub> =4.0 , I <sub>DS</sub> = 40A, V <sub>GS</sub> = 10V	-	15	-	ns
T <sub>r</sub>	Turn-on Rise Time		-	80	-	
t <sub>d(OFF)</sub>	Turn-off Delay Time		-	43	-	
T <sub>f</sub>	Turn-off Fall Time			72	-	

### Gate Charge Characteristics

## Typical Operating Characteristics

Figure 1: Power Dissipation

Figure 2: Drain Current

Tc-Case Temperature( )

Tc-Case Temperature( )

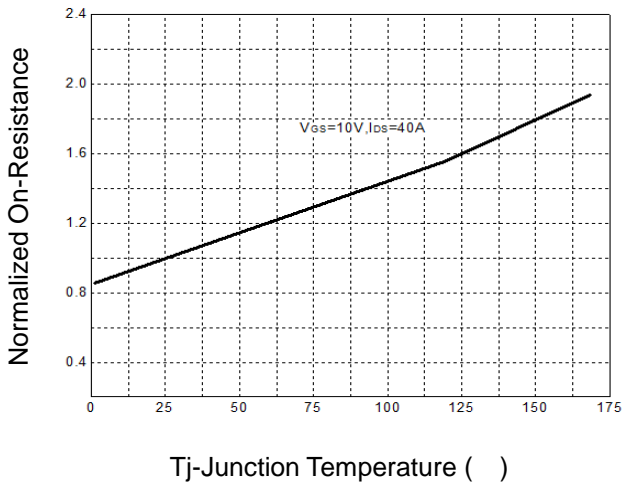
Figure 3: Safe Operation Area

Figure 4: Thermal Transient Impedance

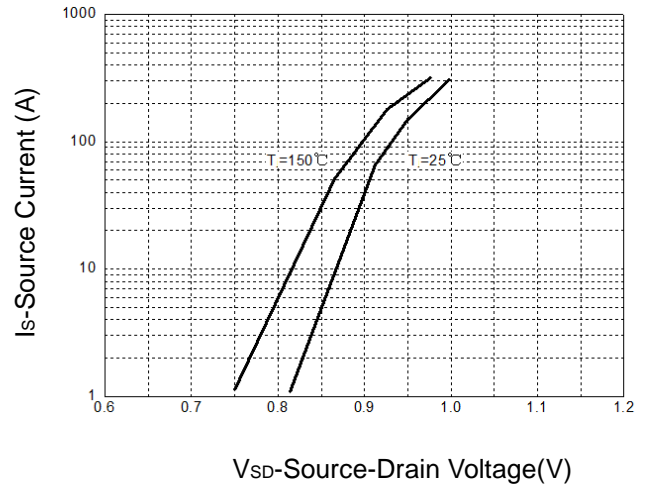
V<sub>DS</sub>-Drain-

**Typical Operating Characteristics(Cont.)**

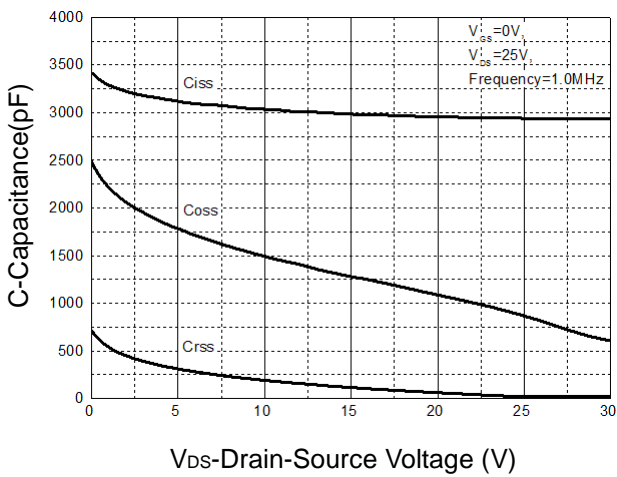
**Figure 7: On-Resistance vs. Temperature**



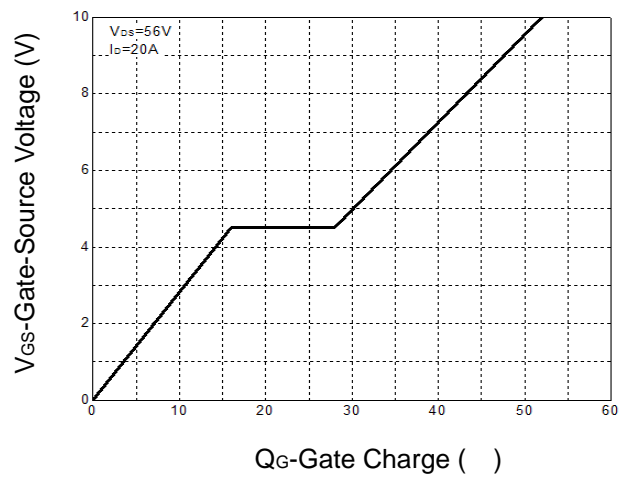
**Figure 8: Source-Drain Diode Forward**



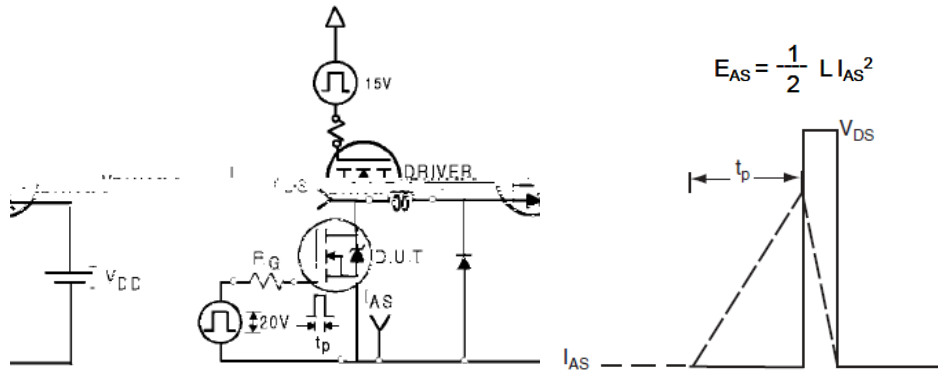
**Figure 9: Capacitance Characteristics**



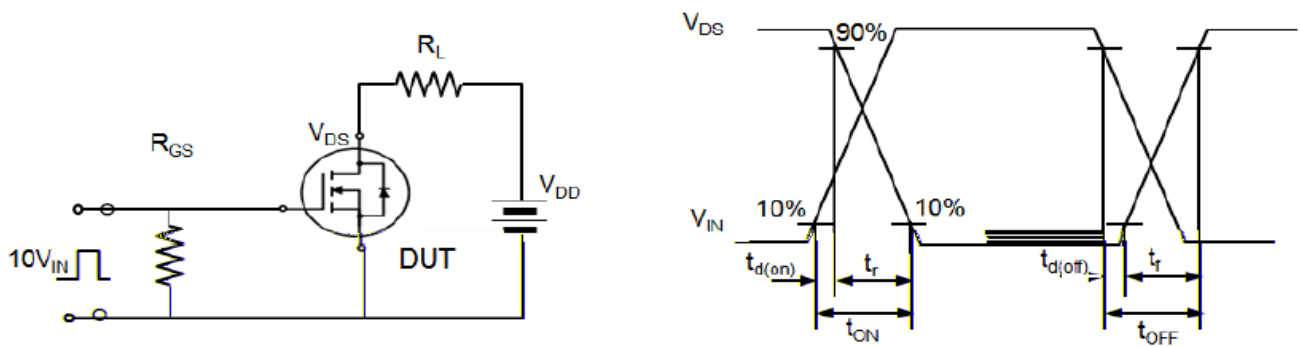
**Figure 10: Gate Charge Characteristics**



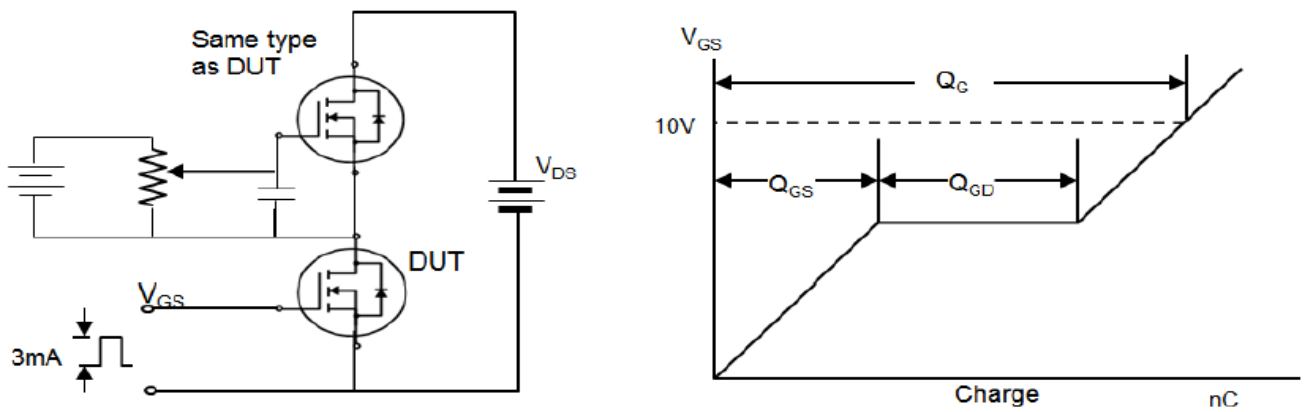
**Avalanche Test Circuit**



**Switching Time Test Circuit**



**Gate Charge Test Circuit**



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## Device Per Unit

Package Type	Unit	Quantity
TO-220FB-3L	Tube	50

## Package Information

### TO-220FB-3L

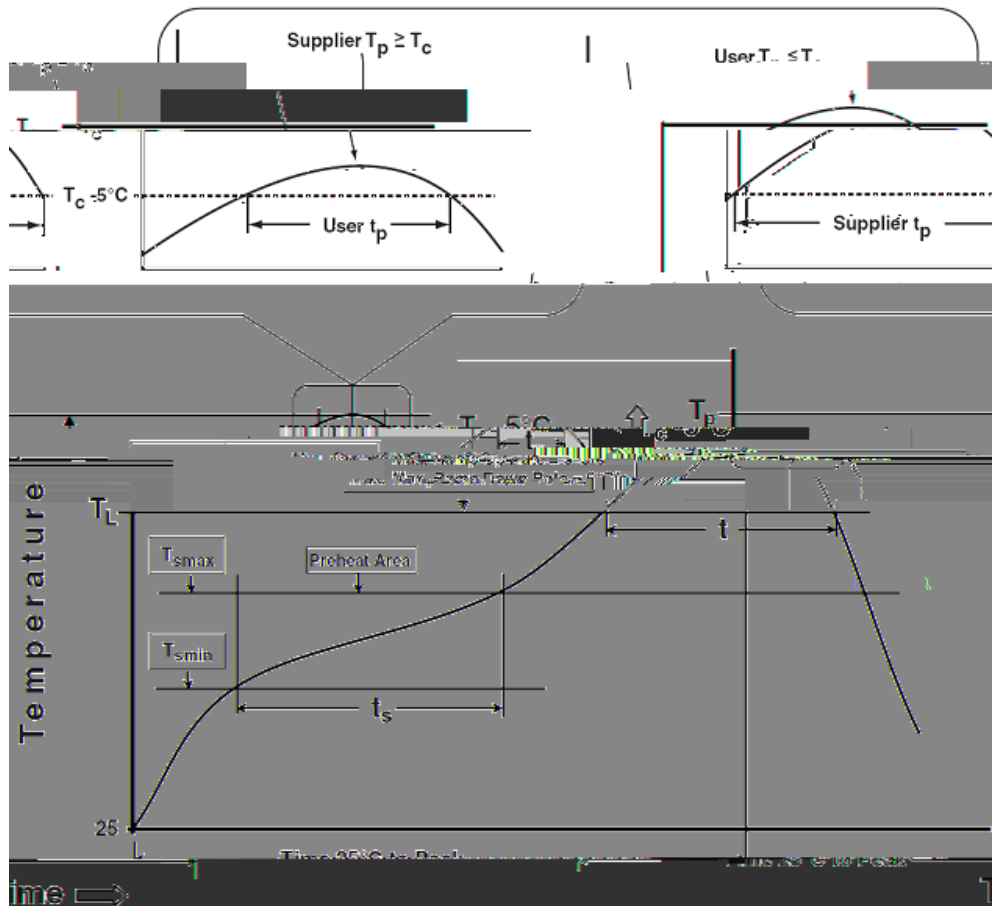
#### COMMON DIMENSIONS

SYMBOL	mm		
	MIN	NOM	MAX
A	4.37	4.57	4.77
A1	1.25	1.30	1.45
A2	2.20	2.40	2.60
b	0.70	0.80	0.95
b2	1.17	1.27	1.47
c	0.40	0.50	0.65
D	15.10	15.60	16.10
D1	8.80	9.10	9.40
D2	5.50	-	-
E	9.70	10.00	10.30
E3	7.00	-	-
e	2.54 BSC		
e1	5.08 BSC		
H1	6.25		





**Classification Profile**



**Classification Reflow Profiles**

Profile Feature	Sn-Pb Eutectic Assembly	Pb-Free Assembly
<b>Preheat &amp; Soak</b>		
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.

# HYG065N07NS1P/B

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

<b>Package Thickness</b>	<b>Volume mm &lt;350</b>	<b>Volume mm 350</b>
2.5 mm	235 °C	220 °C
2.5 mm	220 °C	220 °C

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

<b>Package Thickness</b>	<b>Volume mm &lt;350</b>	<b>Volume mm 350-2000</b>	<b>Volume mm 2000</b>
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