

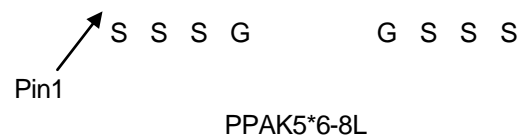
Single N-Channel Enhancement Mode MOSFET

Feature

- 30V/200A
 $R_{DS(ON)} = 1.2\ m\ (typ.) @ V_{GS} = 10V$
 $R_{DS(ON)} = 2.1\ m\ (typ.) @ V_{GS} = 4.5V$
- 100% Avalanche Tested
- Reliable and Rugged
- Halogen- Free Devices Available

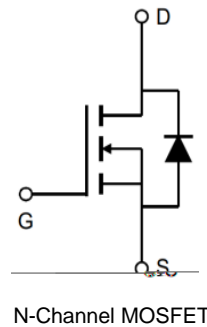
Pin Description

D D D D D D D D



Applications

- Load Switch
- DC/DC Converters



Ordering and Marking Information

	Package Code C2: PPAK5*6-8L Date Code
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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.

HYG014N03LS1C2

Absolute Maximum Ratings

Symbol	Parameter	Rating	Unit
Common Ratings (Tc=25 Unless Otherwise Noted)			
V _{DSS}	Drain-Source Voltage	30	V
V _{GSS}	Gate-Source Voltage	+20/-12	V
T _J	Junction Temperature Range	-55 to 150	
T _{STG}	Storage Temperature Range	-55 to 150	
I _S	Source Current-Continuous(Body Diode)	Tc=25 200	A
Mounted on Large Heat Sink			
I _{DM}	Pulsed Drain Current *	Tc=25 760	A
I _D	Continuous Drain Current	Tc=25 Tc= 200	A

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

Symbol	Parameter	Test Conditions	HYG014N03LS1			Unit
			Min	Typ.	Max	
Dynamic Characteristics						
R _G	Gate Resistance	V _{GS} =0V, V _{DS} =0V, F=1MHz	-	1.8	-	
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =25V, Frequency=1.0MHz	-	5661	-	pF
C _{oss}	Output Capacitance		-	1533	-	
C _{rss}	Reverse Transfer Capacitance		-	80	-	
t _{d(ON)}	Turn-on Delay Time	V _{DD} =30V, R _G =6 I _{DS} =1A, V _{GS} =10V	-	17.6	-	ns
T _r	Turn-on Rise Time		-	32.5	-	
t _{d(OFF)}	Turn-off Delay Time		-	58	-	
T _f	Turn-off Fall Time		-	36	-	
Gate Charge Characteristics						
Q _g	Total Gate Charge	V _{DS} =24V, V _{GS} =10V, I _D =20A	-	69.9	-	nC
Q _{gs}	Gate-Source Charge		-	10.1	-	
Q _{gd}	Gate-Drain Charge		-	10.8	-	

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

Typical Operating Characteristics

Figure 1: Power Dissipation

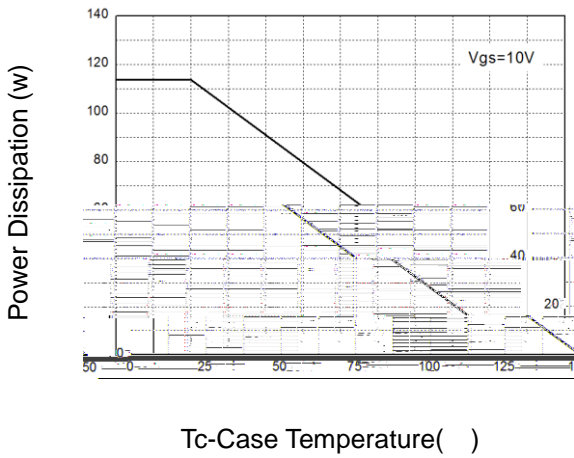


Figure 2: Drain Current

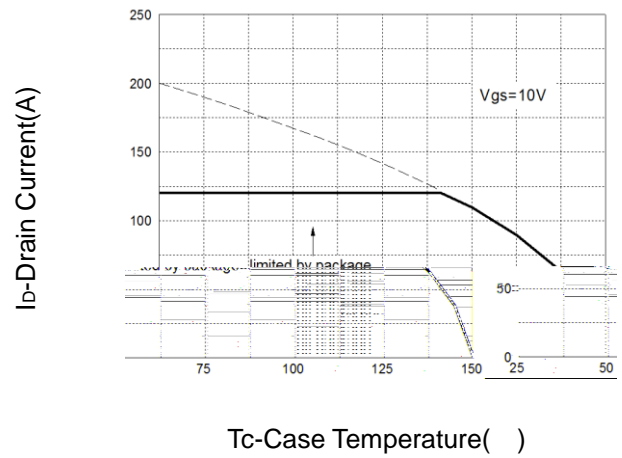


Figure 3: Safe Operation Area

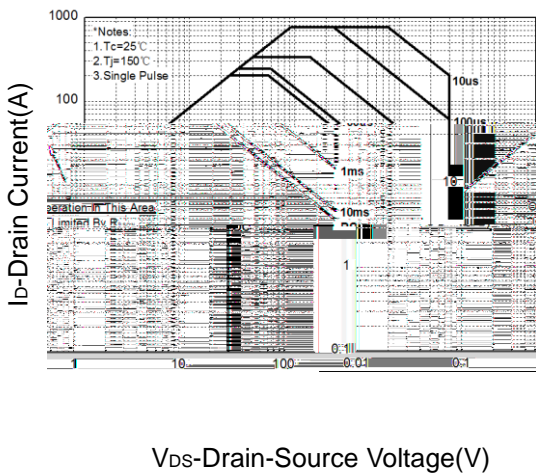


Figure 4: Thermal Transient Impedance

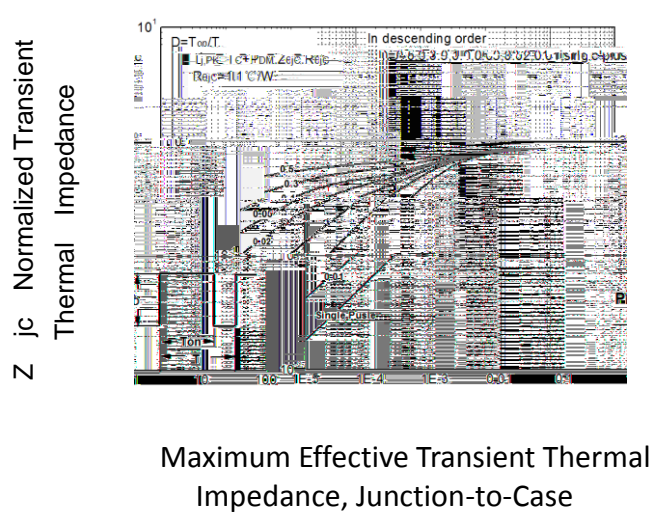


Figure 5: Output Characteristics

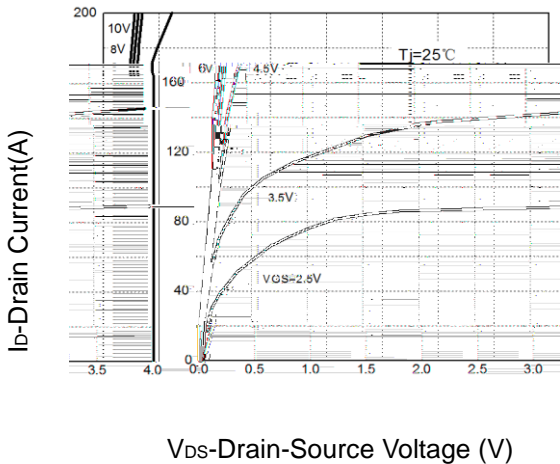
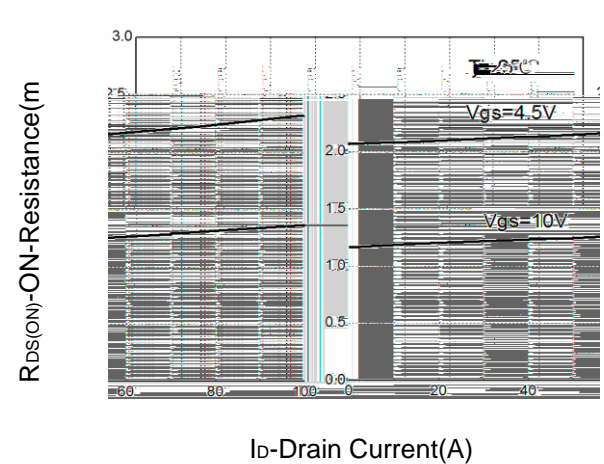
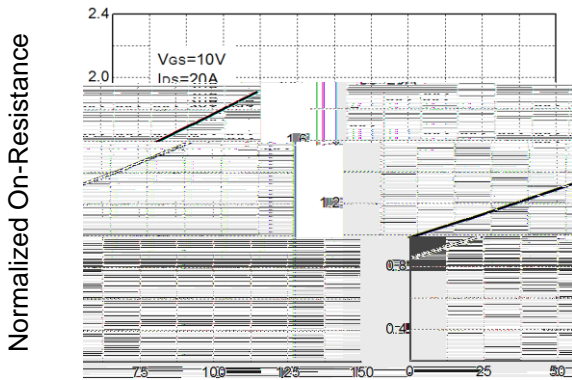


Figure 6: Drain-Source On Resistance



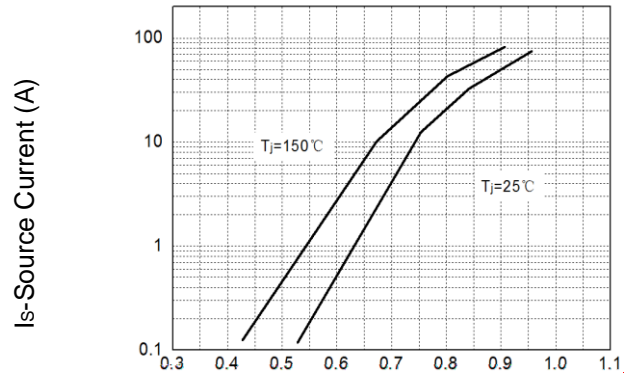
Typical Operating Characteristics(Cont.)

Figure 7: On-Resistance vs. Temperature



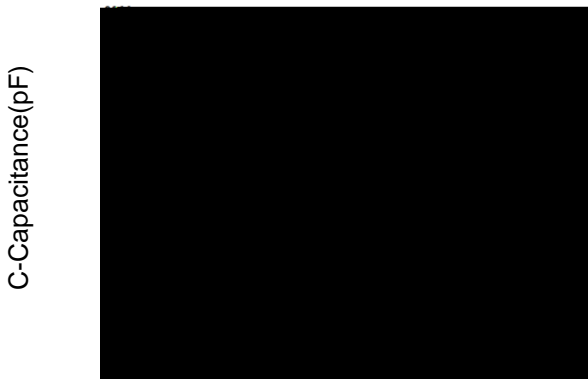
T_j-Junction Temperature ()

Figure 8: Source-Drain Diode Forward



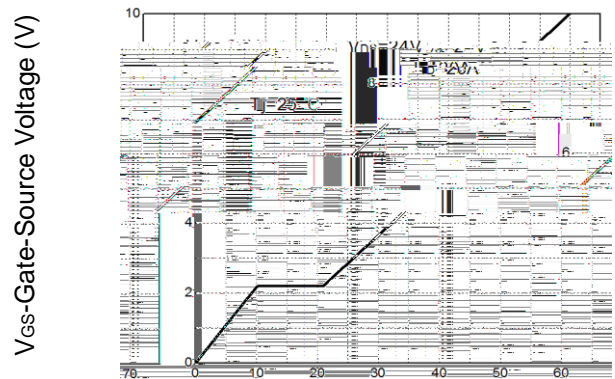
V_{SD}-Source-Drain Voltage(V)

Figure 9: Capacitance Characteristics



V_{DS}-Drain-Source Voltage (V)

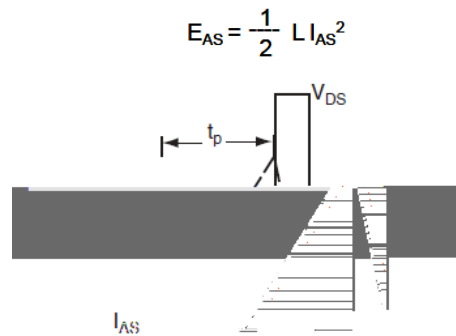
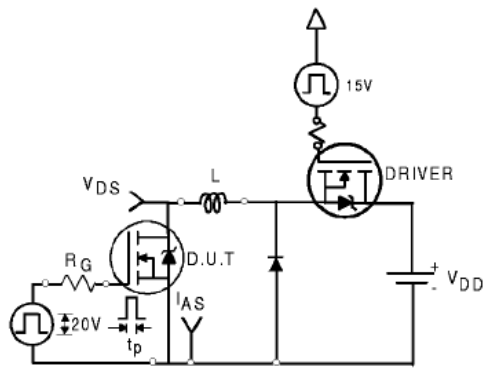
Figure 10: Gate Charge Characteristics



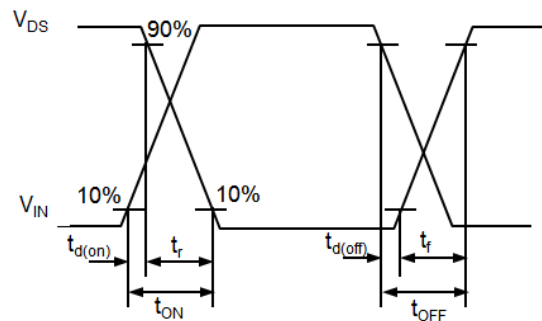
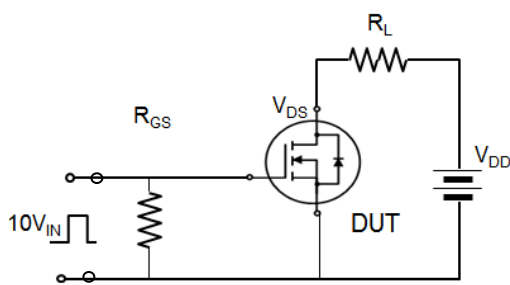
Q_G-Gate Charge ()

HYG014N03LS1C2

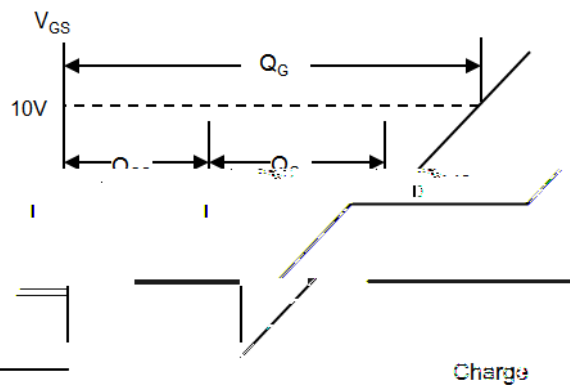
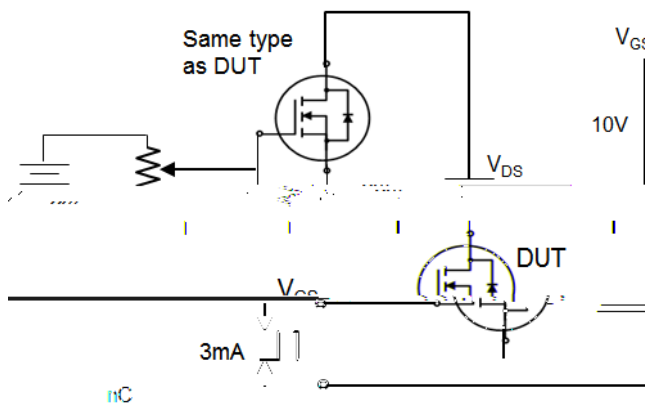
Avalanche Test Circuit



Switching Time Test Circuit

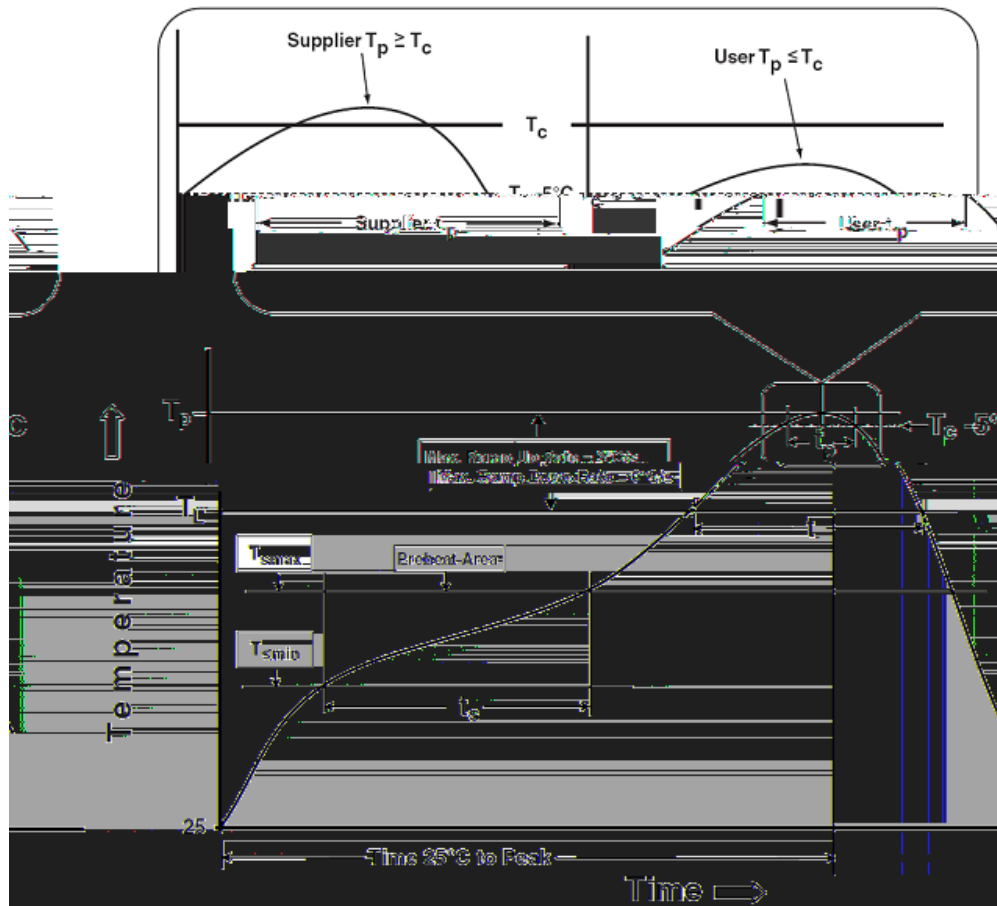


Gate Charge Test Circuit



HYGO

Classification Profile



Classification Reflow Profiles

Profile Feature	Sn-Pb Eutectic Assembly	Pb-Free Assembly
Preheat & Soak		
Temperature min (T_{smin})	100	150
Temperature max (T_{smax})	150	200
Time (T_{smin} to T_{smax}) (t_s)	60-120 seconds	60-120 seconds
Average ramp-up rate (T_{smax} to T_p)	3 /second max.	3 /second max.
Liquidous temperature (T_L)	183	217
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 of the specified classification temperature (T_c)	20** seconds	30** seconds
Average ramp-down rate (T_p to T_{smax})	6 /second max.	6 /second max.
Time 25 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.

HYG014N03LS1C2

Table 1. SnPb Eutectic Process Classification Temperatures (Tc)

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

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

Package Thickness	Volume mm <350	Volume mm 350-2000	Volume mm 2000-2500	Volume mm 2500-3000	Volume mm 3000-3500	Volume mm 3500-4000	Volume mm 4000-4500	Volume mm 4500-5000	Volume mm 5000-5500	Volume mm 5500-6000	Volume mm 6000-6500	Volume mm 6500-7000	Volume mm 7000-7500	Volume mm 7500-8000	Volume mm 8000-8500	Volume mm 8500-9000	Volume mm 9000-9500	Volume mm 9500-10000	