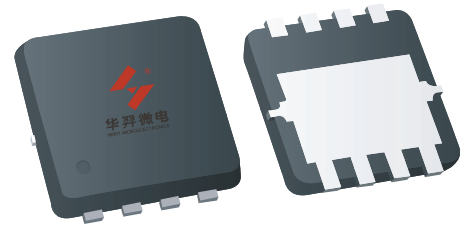


N-Channel Enhancement Mode MOSFET

Feature

- 100V/37A
R_{DS(ON)} = 16 @V_{GS} = 10V
R_{DS(ON)} = 21 @V_{GS} = 4.5V
- 100% Avalanche Tested
- 100% DVDS
- Reliable and Rugged
- Halogen Free and Green Devices Available
(RoHS Compliant)

Pin Description



Applications

- Server power supply
- Li-battery protection
- DC-DC Converters
- High Frequency Circuits

Ordering and Marking Information

HYG
190N10LS
XYMXXXXX

Package Code

C1: PDFN8L(3.3x3.3)

Date Code e 33Q825()-224(e)-225(3t24s)-2Cn-U

Absolute Maximum Ratings

Symbol	Parameter	Rating	Unit	
Common Ratings (Tc=25°C Unless Otherwise Noted)				
V _{DSS}	Drain-Source Voltage	100	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)	Tc=25°C	37	A
Mounted on Large Heat Sink				
I _{DM}	Pulsed Drain Current *	Tc=25°C	111	A
I _D	Continuous Drain Current	Tc=25°C	37	A
		Tc=100°C	26	A
P _D	Maximum Power Dissipation	Tc=25°C	49.5	W
		Tc=100°C	24.7	W
R _{θJC}	Thermal Resistance, Junction-to-Case		3.03	°C/W
R _{θJA}	Thermal Resistance, Junction-to-Ambient **		100	°C/W
E _{AS}	Single Pulsed-Avalanche Energy ***	L=0.3mH	44	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(Tc =25°C Unless Otherwise Noted)

Symbol	Parameter	Test Conditions	HYG190N10LS1			Unit
			Min	Typ.	Max	
Static Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _{DS} =250 A	100	-	-	V
I _{DSS}	Drain-to-Source Leakage Current	V _{DS} =100V, 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	1.1	1.7	2.3	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	-	16	20	m
		V _{GS} =4.5V, I _{DS} =20A	-	21	34	m
Diode Characteristics						
V _{SD}	Diode Forward Voltage	I _{SD} =20A, V _{GS} =0V	-	1.0	1.2	V
t _{rr}	Reverse Recovery Time	I _{SD} =20A, dI _{SD} /dt=100A/	-	34	-	ns
Q _{rr}	Reverse Recovery Charge		-	32	-	nC

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

Symbol	Parameter	Test Conditions	HYG190N10LS1			Unit
			Min	Typ.	Max	
Dynamic Characteristics						
R _G	Gate Resistance	V _{GS} =0V, V _{DS} =0V, F=1MHz	-	1.1	-	
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =25V, Frequency=1MHz	-	899	-	pF
C _{oss}	Output Capacitance		-	371	-	
C _{rss}	Reverse Transfer Capacitance		-	29	-	
t _{d(ON)}	Turn-on Delay Time	V _{DD} =50V, R _G =5 I _{DS} =20A, V _{GS} =10V	-	8.8	-	ns
T _r	Turn-on Rise Time		-	22	-	
t _{d(OFF)}	Turn-off Delay Time		-	19	-	
T _f	Turn-off Fall Time		-	36	-	

Typical Operating Characteristics

Figure 1: Power Dissipation

Figure 2: Drain Curr(pa)74 46.624m[G.ipatioi

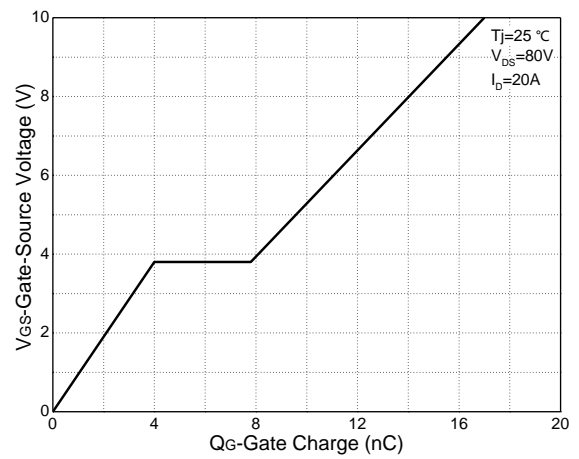
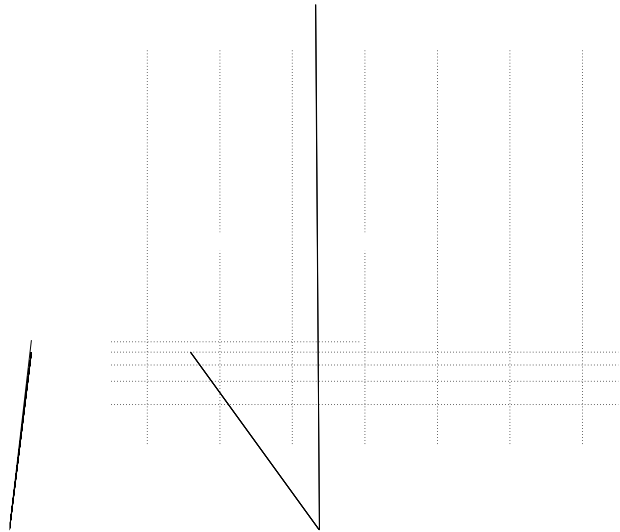
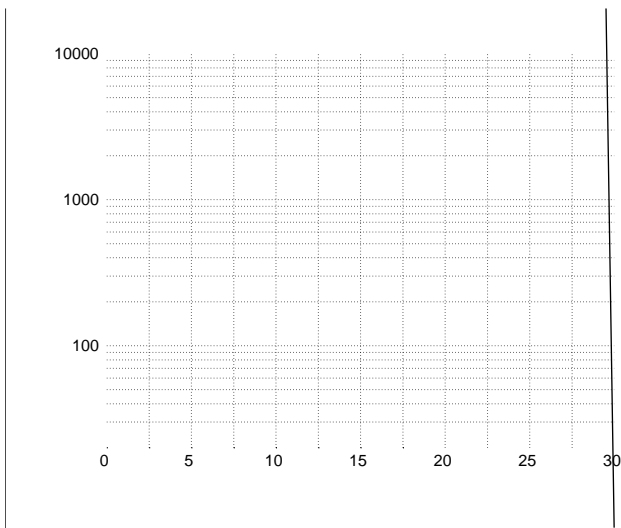
Typical Operating Characteristics(Cont.)

Figure 7: On-Resistance vs. Temperature

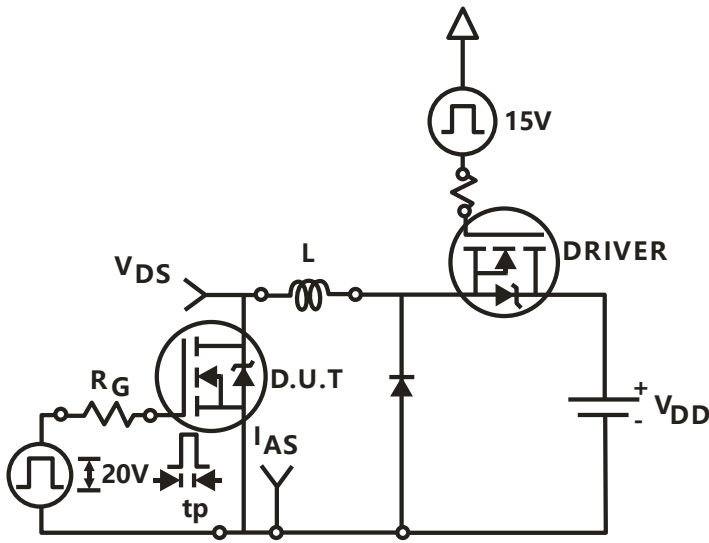
Figure 8: Source-Drain Diode Forward

Figure 9: Capacitance Characteristics

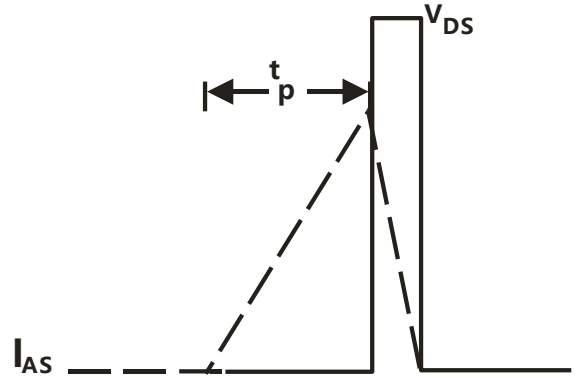
Figure 10: Gate Charge Characteristics



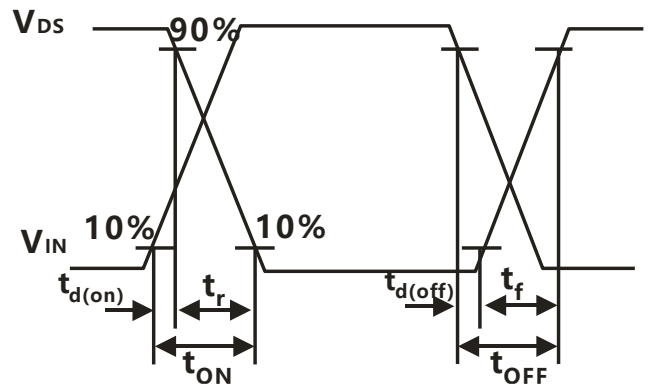
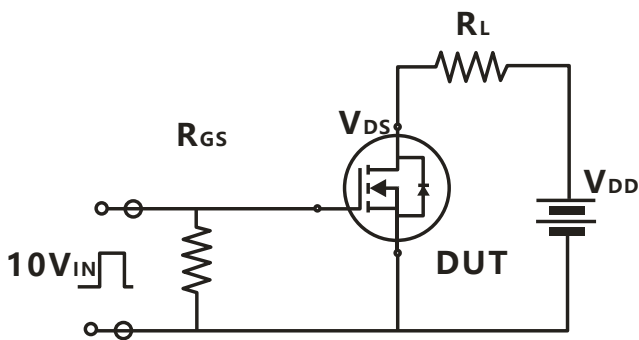
Avalanche Test Circuit



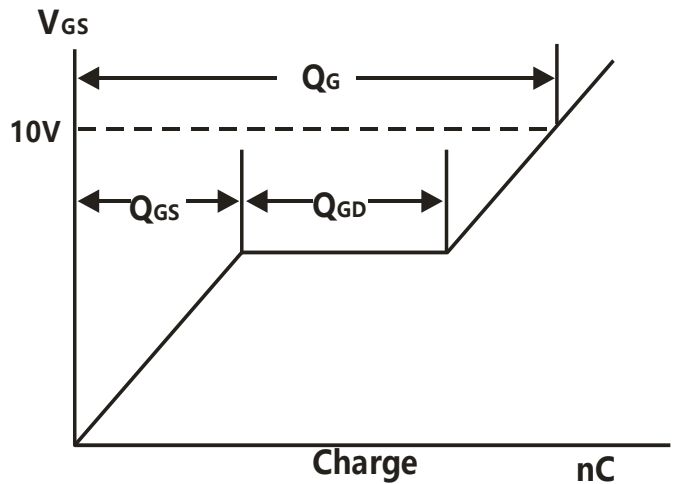
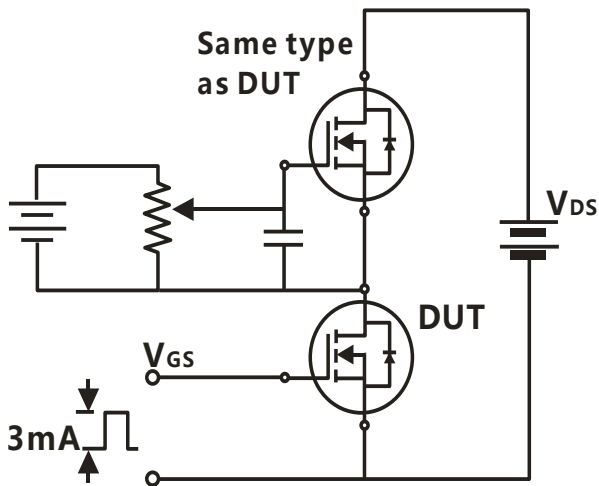
$$E_{AS} = \frac{1}{2} L I_{AS}^2$$



Switching Time Test Circuit



Gate Charge Test Circuit

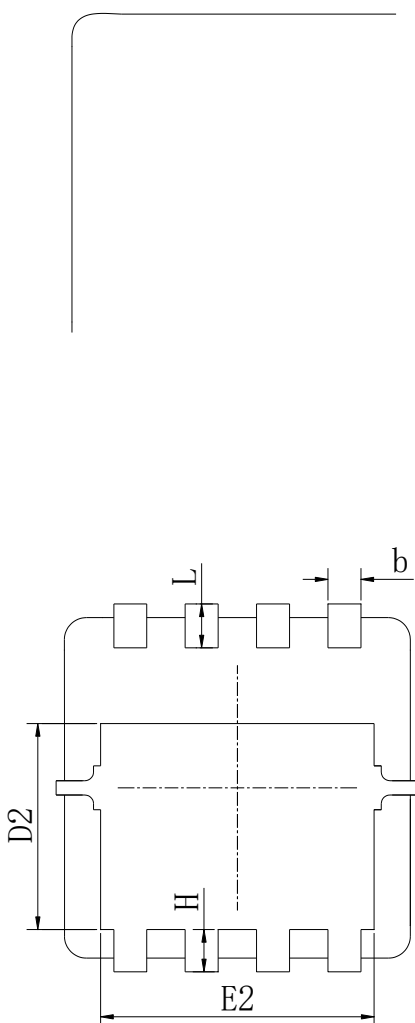


Device Per Unit

Package Type	Unit	Quantity
PDFN8L(3.3x3.3)	Reel	6500

Package Information

PDFN8L(3.3x3.3)



COMMON DIMENSIONS			
SYMBOL	mm		
	MIN	NOM	MAX
A	0.70	0.75	0.80
b	0.25	0.30	0.35
c	0.10	0.15	0.25
D	3.25	3.35	3.45
D1	3.00	3.10	3.20
D2	1.78	1.88	1.98
E1	3.10	3.20	3.30
E2	2.44	2.54	2.64
e	0.65BSC		
H	0.30	0.39	0.50
L	0.30	0.40	0.50
M	\	\	0.10
*Not specified			

Classification Profile

Classification Reflow Profiles

Profile Feature	Sn-Pb Eutectic Assembly	Pb-Free Assembly
	Preheat & Soak	

Temperature min (T_{smin})

Temperature max (T_{smax})

Time (T_{smin} to T_{smax}) (t_s)

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
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