Description

This Power MOSFET is produced using Hua semiconductor's advanced SGT MOSFET technology. This product has been designed and will qualified to AEC Q101 standard for use in high performance automotive applications.

Features

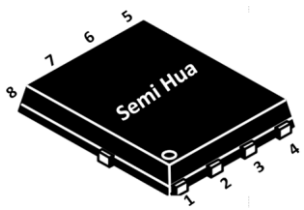
- RDS(on) = 13 mΩ (max.) @ VGS = 10V, ID = 20A
- Low FOM RDS(on)*QG
- Low Reverse Recovery Charge, Qrr
- 100% UIL Tested
- Q101 compliant
- RoHS Compliant

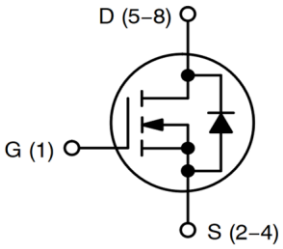
Applications

- Switching power supplies
- Power switches
- 48V systems

Package and Ordering

Part Number	Goods picture
Package	PDFN5060
Mark	55N08
Packing	Tape & Reel
Quantity	1500





Maximum Ratings T_J =25 °C unless otherwise noted

Symbol	Parameter		Value	Unit
V_{DSS}	Drain to Source Voltage		80	V
V_{GSS}	Gate to Source Voltage		±20	V
I_D	Continuous Drain Current-$R_{\theta JC}$ (Notes 1,3)	T_C = 25°C	55	A
		T_C = 100°C	39	
	Continuous Drain Current-$R_{\theta JA}$ (Notes 1,2,3)	T_A = 25°C	12	
		T_A = 100°C	9	
P_D	Power Dissipation $R_{\theta JC}$ (Notes 1)	T_C = 25°C	70	W
		T_C = 100°C	35	
	Power Dissipation $R_{\theta JA}$ (Notes 1,2)	T_A = 25°C	3.5	
		T_A = 100°C	1.7	
I_{DM}	Pulsed Drain Current	tp = 10 us	220	A
I_S	Source Current (Body Diode)		55	A
E_{AS}	Single Pulsed Avalanche Energy (Note 1,4)		98	mJ
T_L	Lead Temperature for Soldering Purposes-10 sec		260	°C
T_J, T_{STG}	Operating and Storage Temperature		-55 to +175	°C

Thermal Characteristics

Symbol	Parameter	Value	Unit
$R_{\theta JC}$	Thermal Resistance, Junction to Case, Max.	2.13	°C/W
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient, Max. (Note 2)	43	°C/W

Electrical Characteristics

Symbol	Parameter	Conditions	Value			Unit
			Min.	Typ.	Max.	

Static characteristics T_J =25 °C unless otherwise noted

B_{VDSS}	Drain to Source Breakdown Voltage	ID = 250 μA, VGS = 0 V	80	-	-	V
ΔBVDSS / ΔTJ	Breakdown Voltage Temperature Coefficient	ID = 250 μA, Referenced to 25°C	-	0.03	-	V/°C
I_{DSS}	Drain to Source Leakage	VDS = 80 V, VGS = 0 V Tj=25°C	-	-	10	μA
		VDS = 80 V, VGS = 0 V Tj=125°C	-	-	100	μA
I_{GSS}	Gate to Source Leakage	VGS = ±20 V, VDS = 0 V	-	-	±100	nA
$V_{GS(th)}$	Gate Threshold Voltage	VGS = VDS, ID = 250 μA	1.2	1.75	2.3	V
$R_{DS(on)}$	Static Drain to Source On Resistance	Vgs=4.5V, ID=20A Tj=25°C	-	11.6	18.5	mΩ
		Vgs=10V, ID=20A Tj=25°C	-	8.1	11.3	mΩ
R_g	Gate Resistance	f = 1 MHz	-	1.3	-	Ω
gfs	Forward Transconductance	Vds=8V, ID=20A	-	50	-	S

Dynamic Characteristics

C_{iss}	Input Capacitance	V_{DS} = 40 V, VGS = 0 V,f = 1 MHz	-	1900		pF
C_{oss}	Output Capacitance		-	360		pF
C_{rss}	Reverse Transfer Capacitance		-	26		pF
$Q_{g(tot)}$ 1	Total Gate Charge	VDS = 40 V,ID=20A, VGS = 0 to 10 V	-	31		nC
$Q_{g(tot)}$ 2	Total Gate Charge	V_{DS} = 40 V,I_D=20A, VGS = 0 to 4.5 V	-	16		nC
Q_{gs}	Gate to Source Charge		-	5.3		nC
Q_{gd}	Gate to Drain (Miller) Charge		-	6.3		nC
V_p	Gate Plateau Volatge		-	3.2	-	V
$t_{d(on)}$	Turn-On Delay Time	VDD = 64 V, ID = 20 A, VGS = 10 V, RG = 2.5 Ω	-	9.5		nS
t_r	Turn-On Rise Time		-	7		nS
$t_{d(off)}$	Turn-Off Delay Time		-	27		nS
t_f	Turn-Off Fall Time		-	6		nS

Drain-Source Diode Characteristics

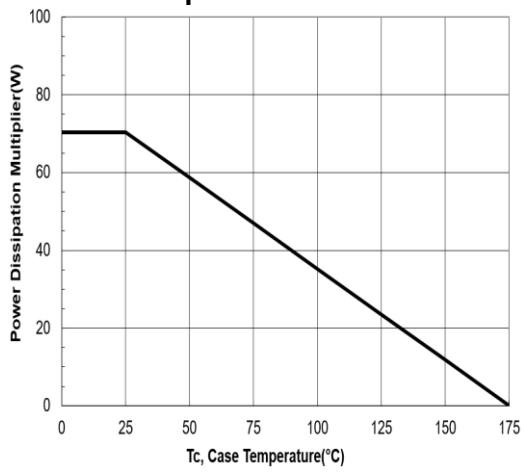
I_S	Maximum Continuous Drain to Source Diode Forward Current		-	-	55	A
I_{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	220	A
V_{SD}	Drain to Source Diode Forward Voltage	Vgs=0V, ID=20A Tj=25°C	-	0.87	1.2	V
		Vgs=0V, ID=20A Tj=125°C	-	0.69		V
T_{rr}	Reverse Recovery Time	VGS = 0 V, ISD = 20 A, dI_F/dt = 100 A/μs	-	33	-	nS
Q_{rr}	Reverse Recovery Charge		-	28	-	nC

Notes:

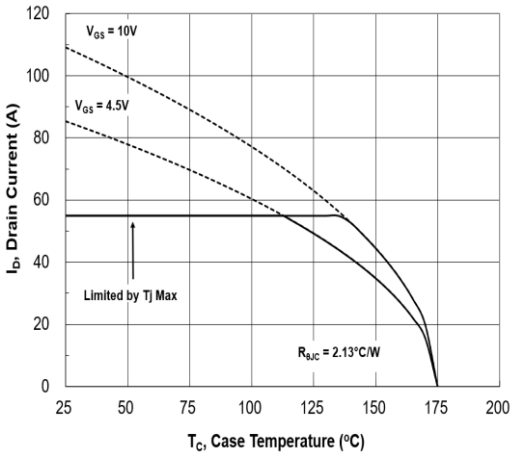
1. they are not constants value, your application eenvironment will effect them.
2. RθJA is the sum of the junction-to-case and case-to-ambient thermal resistance where the case thermal reference is defined as the solder mounting surface of the drain pins. R θJC is guaranteed by design while RθJA is determined by the user's board design. The maximum rating presented here is based on mounting on a 1 in2 pad of 2oz copper.
3. it is limited by $T_{j\ max}$.
4. L = 1 mH, IAS = 14 A, starting TJ = 25°C.

Typical Performance Characteristics

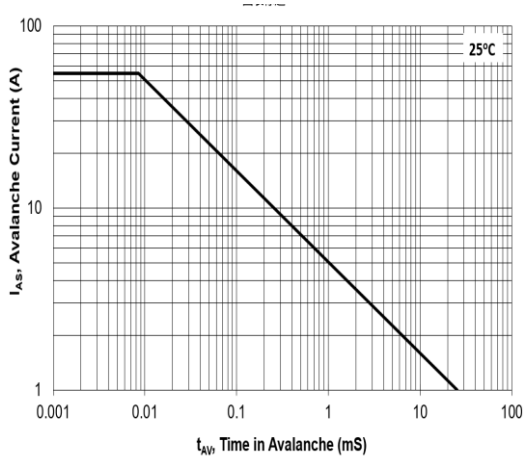
1. Power Dissipation



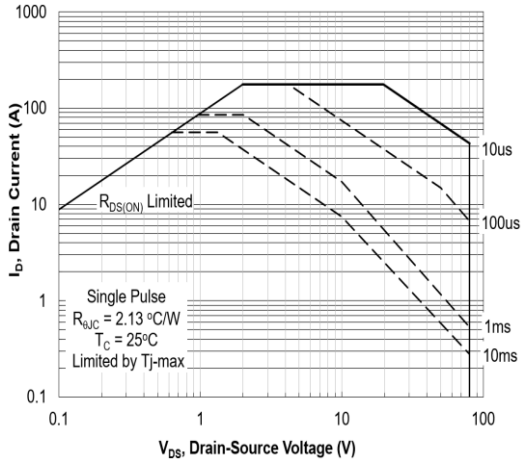
2. Drain Current



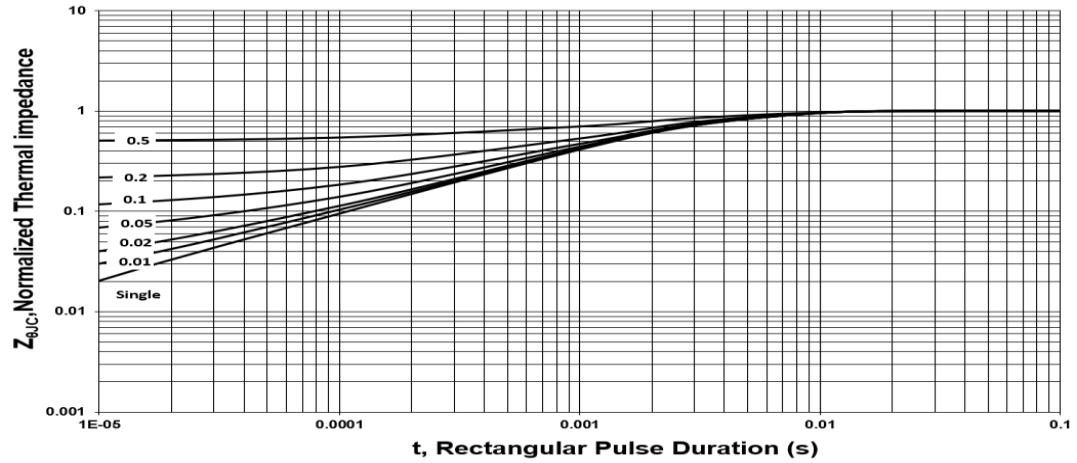
3. UIS



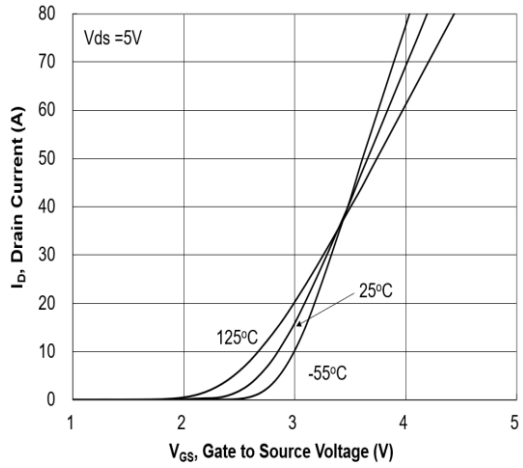
4. Forward Bias Safe Operating Area



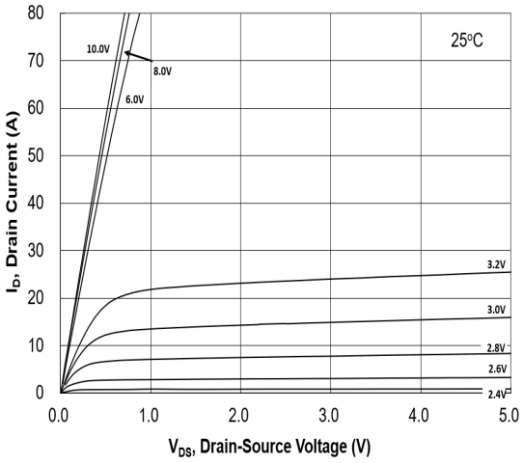
5. Transient Thermal Impedance (Normalized)



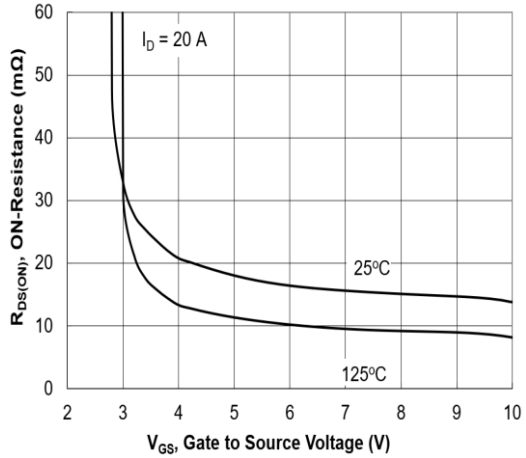
6. Transfer Characteristics



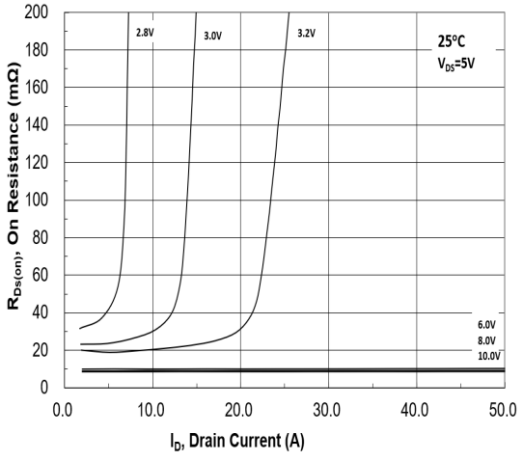
7. Saturation Characteristics



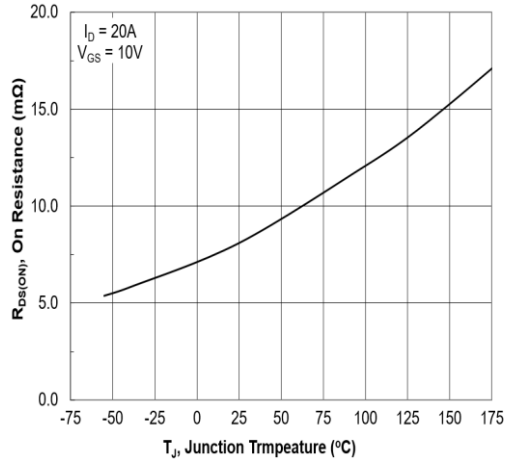
8. Rdson vs Gate Voltage



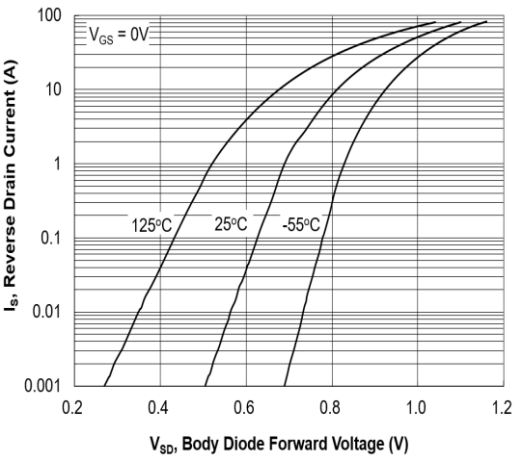
9. Rdson vs Drain Current



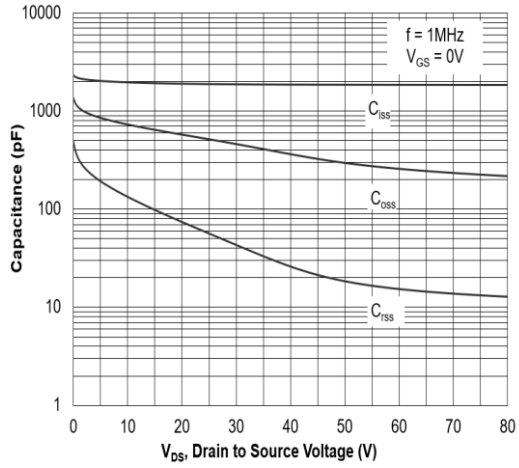
10. Rdson vs Junction Temperature



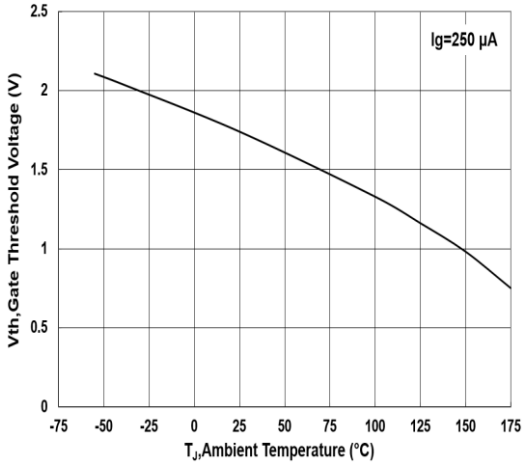
11. Forward Diode Characteristics



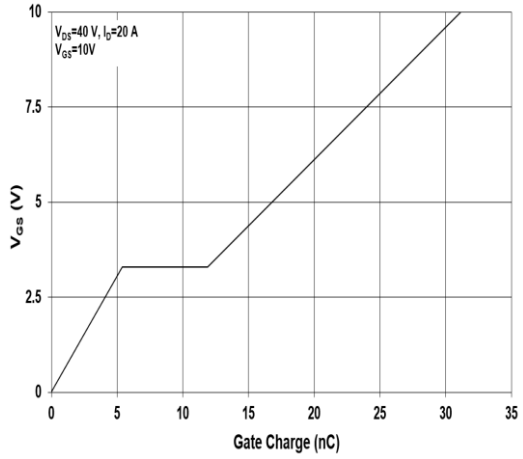
12. Capacitance vs Drain to Source Voltag



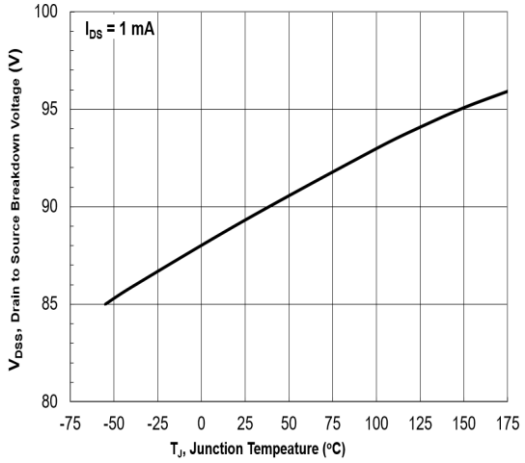
13. Gate Threshold Voltage vs Temperature



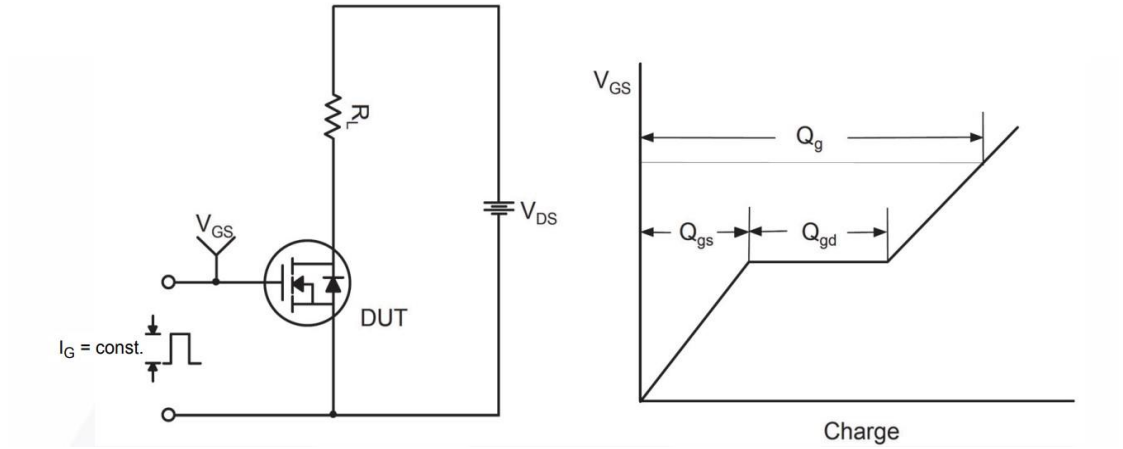
14. Gate Charge



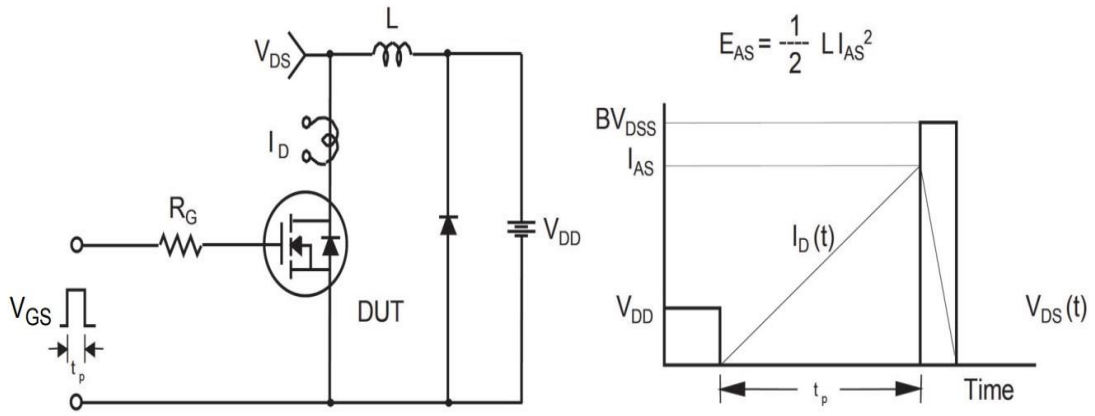
15. Breakdown Voltage vs Junction Tempereature



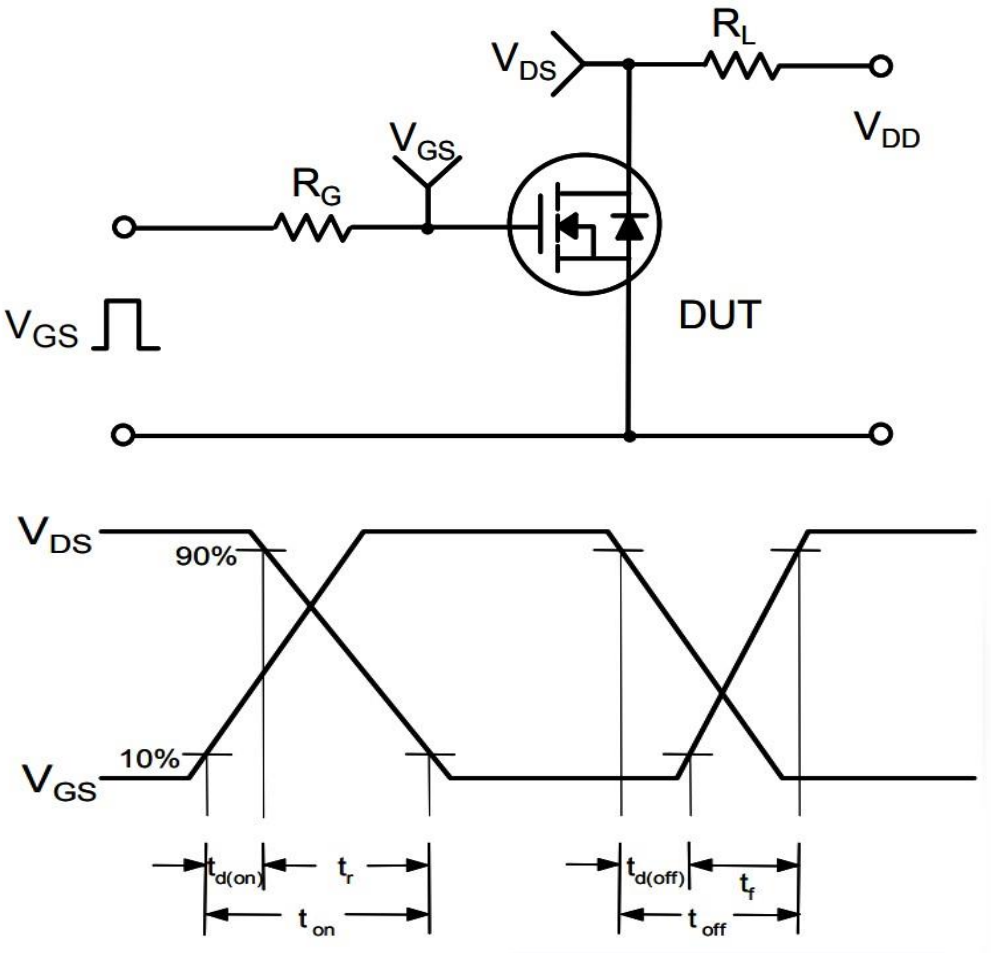
16. Gate Charge Test Circuit & Waveform



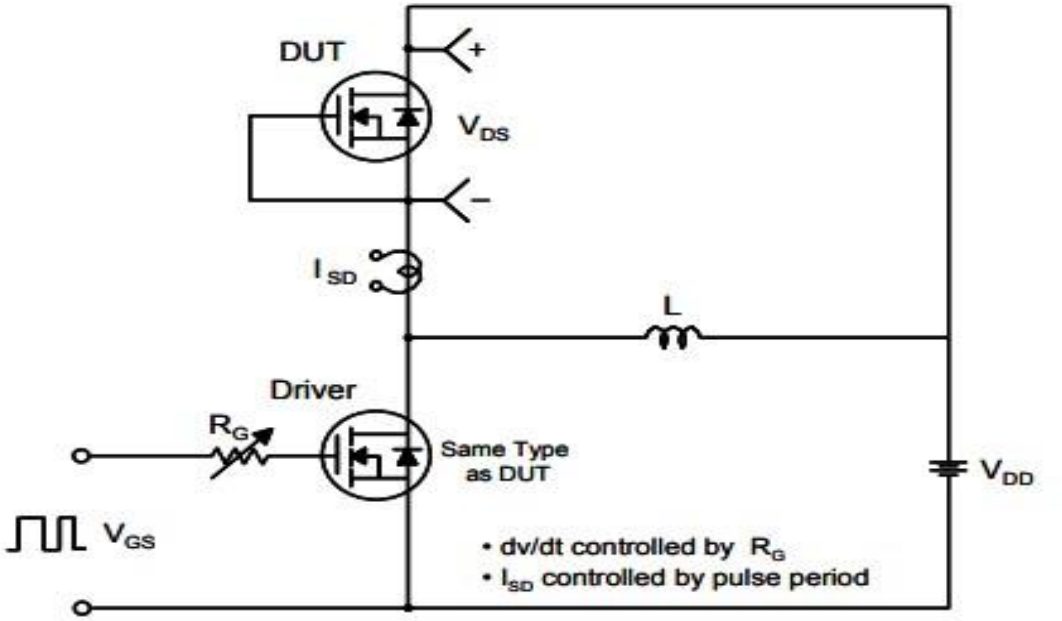
17. UIS Test Circuit & Waveform

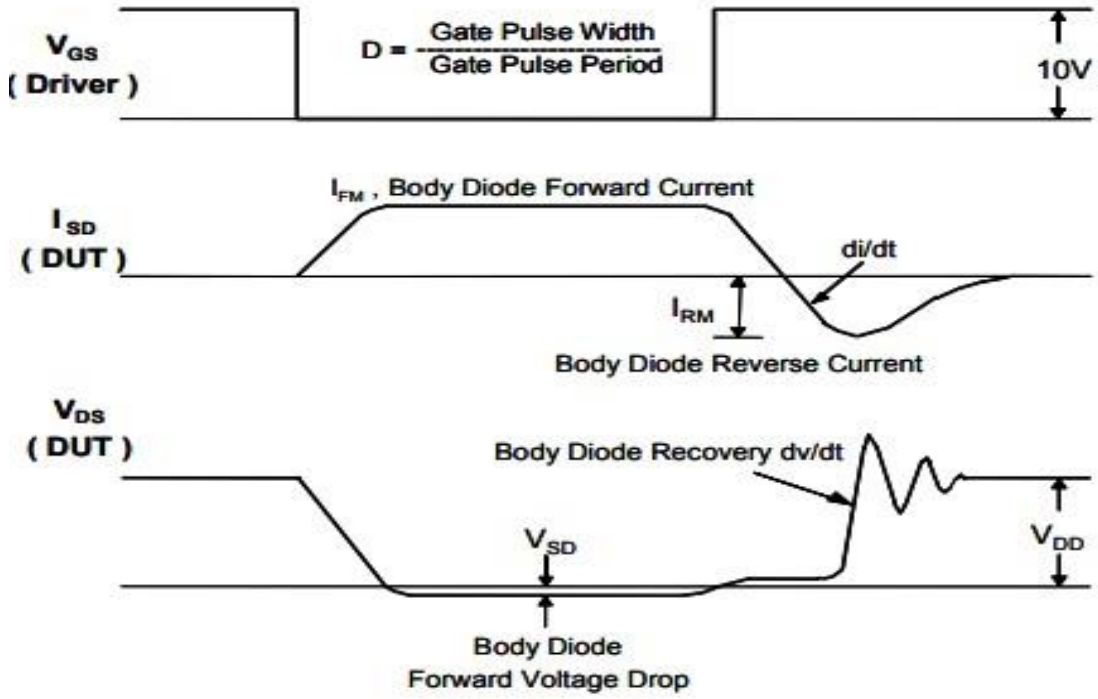


18. Switching Test Circuit & Waveform

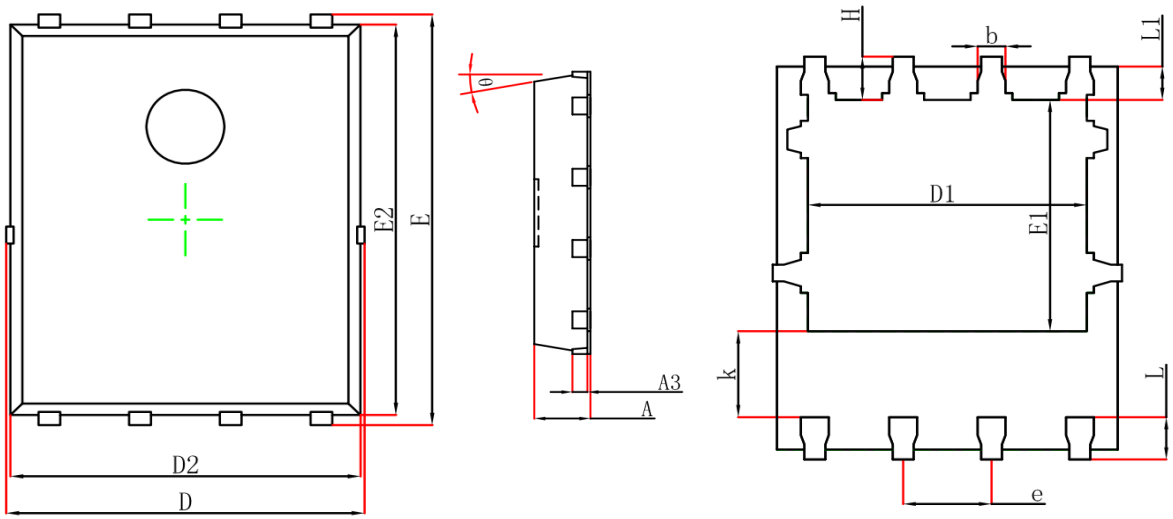


19. Peak Diode Recovery dv/dt Test Circuit & Waveforms





PDFNWB5X6-8L Package Case Outline



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.000	0.035	0.039
A3	0.254REF		0.010REF	
D	4.944	5.096	0.195	0.201
E	5.974	6.126	0.235	0.241
D1	3.910	4.110	0.154	0.162
E1	3.375	3.575	0.133	0.141
D2	4.824	4.976	0.190	0.196
E2	5.674	5.826	0.223	0.229
k	1.190	1.390	0.047	0.055
b	0.350	0.450	0.014	0.018
e	1.270TYP		0.050TYP	
L	0.559	0.711	0.022	0.028
L1	0.424	0.576	0.017	0.023
H	0.574	0.726	0.023	0.029
θ	10°	12°	10°	12°