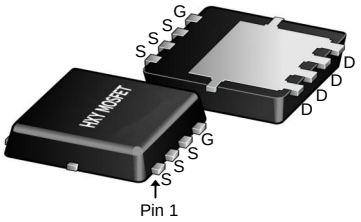
General Description

The HXYG125N06NF use advanced SGT MOSFET technology to provide low RDS(ON), low gate charge, fast switching and excellent avalanche characteristics.

This device is specially designed to get better ruggedness and suitable to use in

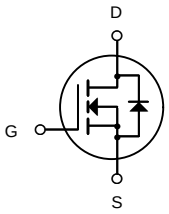


DFN5X6-8L

General Features

V_{DS} =60V I_D =125A

$R_{DS(ON)}$ < 2.9mΩ@ V_{GS}=10V



N-Channel MOSFET

Applications

Consumer electronic power supply Motor control

Synchronous-rectification Isolated DC

Synchronous-rectification applications

Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
HXYG125N06NF	DFN5X6-8L	125N06 XXXX	5000

Absolute Maximum Ratings (T_C=25℃unless otherwise noted)

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	60	V
V_{GS}	Gate-Source Voltage	±20	V
I_D@T_C=25℃	Continuous Drain Current, V_{GS} @ 10V	125	A
I_D@T_C=100℃	Continuous Drain Current, V_{GS} @ 10V	101	A
I_{DM}	Pulsed Drain Current[2]	641	A
EAS	Single Pulse Avalanche Energy[3]	189	mJ
P_D@T_C=25℃	Total Power Dissipation[4]	113	W
T_{STG}	Storage Temperature Range	-55 to 150	℃
T_J	Operating Junction Temperature Range	-55 to 150	℃
$R_{\theta JC}$	Thermal Resistance from Junction-to-Ambient[3]	1.11	℃/W
$R_{\theta JA}$	Thermal Resistance Junction-Ambient [1]	39.4	℃/W

Electrical Characteristics (T_J = 25°C, unless otherwise noted)

Static Characteristics						
Symbol	Parameter	Test Conditions	Value			Units
			Min.	Typ.	Max.	
V_{DSS}	Drain to Source Breakdown Voltage	V_{GS}=0V, I_D=250μA	60	--	--	V
I_{DSS}	Drain to Source Leakage Current	V_{DS} = 60V, V_{GS}= 0V	--	--	1	μA
$I_{GSS(F)}$	Gate to Source Forward Leakage	V_{GS} =+20V	--	--	100	nA
$I_{GSS(R)}$	Gate to Source Reverse Leakage	V_{GS} =-20V	--	--	-100	nA
$V_{GS(TH)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D = 250μA	1.2	--	2.2	V
$R_{DS(ON)}$	Drain-to-Source On-Resistance	V_{GS}=10V, I_D=20A	--	2.4	2.9	mΩ

Dynamic Characteristics						
Symbol	Parameter	Test Conditions	Value			Units
			Min.	Typ.	Max.	
C_{iss}	Input Capacitance	V_{GS} = 0V V_{DS} = 30V f = 1.0MHz	--	4610	6915	pF
C_{oss}	Output Capacitance		--	2188	3282	
C_{rss}	Reverse Transfer Capacitance		--	66	132	
R_g	Gate resistance		--	0.93	18.8	Ω

Resistive Switching Characteristics						
Symbol	Parameter	Test Conditions	Value			Units
			Min.	Typ.	Max.	
$t_{d(ON)}$	Turn-on Delay Time	I_D =40A V_{DS} = 30V V_{GS} = 10V R_G = 2.7Ω	--	14.13	--	ns
tr	Rise Time		--	63.73	--	
$t_{d(OFF)}$	Turn-Off Delay Time		--	46.8	--	
t_f	Fall Time		--	105.07	--	
Q_g	Total Gate Charge	V_{GS} =10V V_{DS} = 30V I_D =40A	--	74.37	111.56	nC
Q_{gs}	Gate Source Charge		--	17.26	--	
Q_{gd}	Gate Drain Charge		--	9.44	18.88	

Source-Drain Diode Characteristics						
Symbol	Parameter	Test Conditions	Value			Units
			Min.	Typ.	Max.	
I_S	Diode Forward Current	T_C =25 °C	--	--	160	A
V_{SD}	Diode Forward Voltage	I_S=40A, V_{GS}=0V	--	0.83	1.2	V
t_{rr}	Reverse Recovery time	I_S=40A, dI/dt=300A/μs	--	52.78	105.56	ns
Q_{rr}	Reverse Recovery Charge		--	56.31	112.62	nC

[a1]: Repetitive rating; pulse width limited by maximum junction temperature [a2]: VDD=30V, L=0.3mH, Rg=25Ω, Starting TJ=25 °C

Typical Characteristics

Fig 1: Output Characteristics

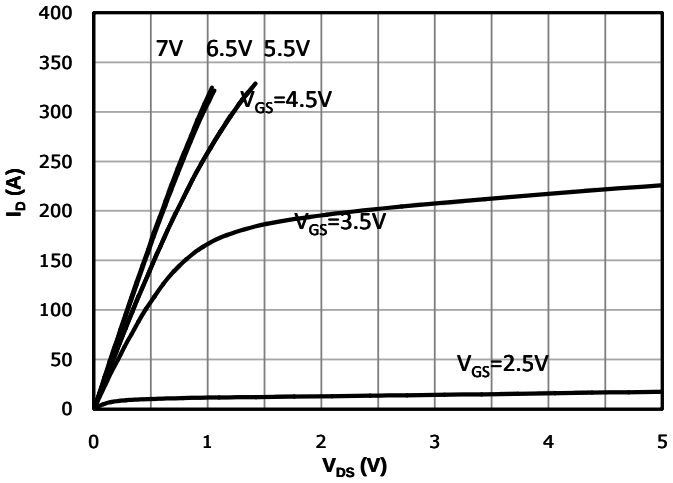


Fig 2: Transfer Characteristics

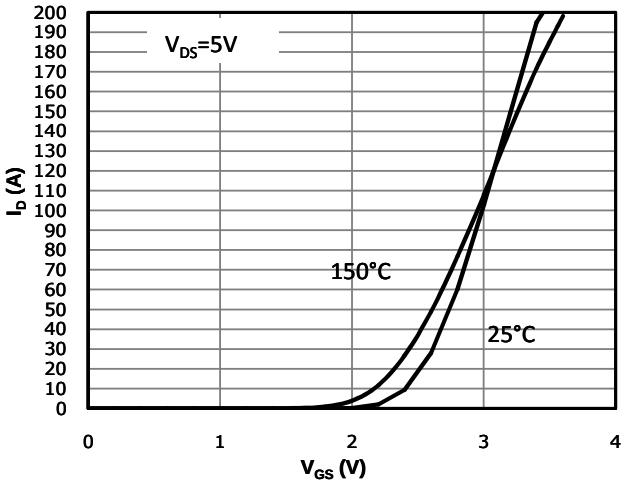


Fig 3: Rds(on) vs Drain Current and Gate Voltage

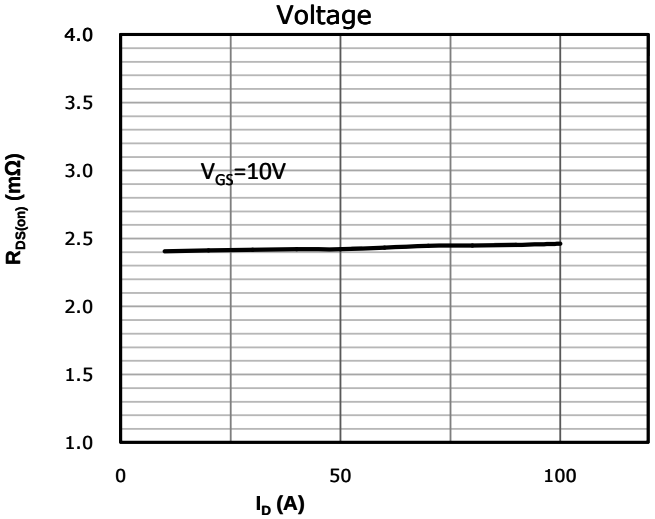


Fig 4: Rds(on) vs Gate Voltage

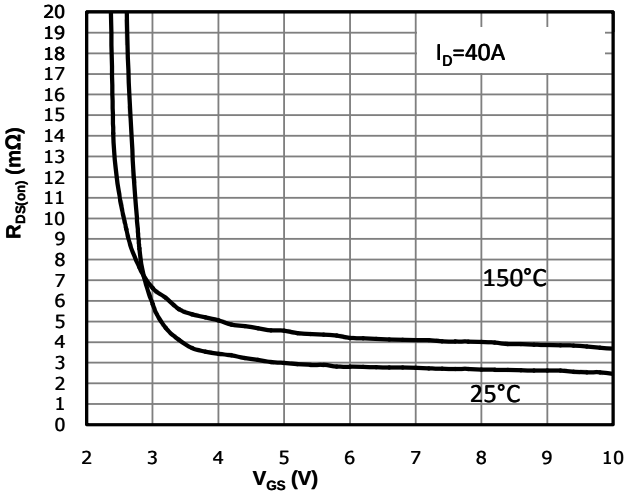


Fig 5: Rds(on) vs. Temperature

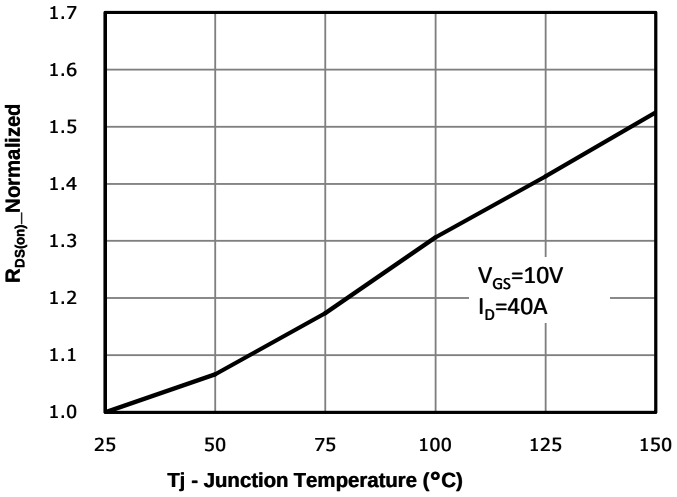


Fig 6: Capacitance Characteristics

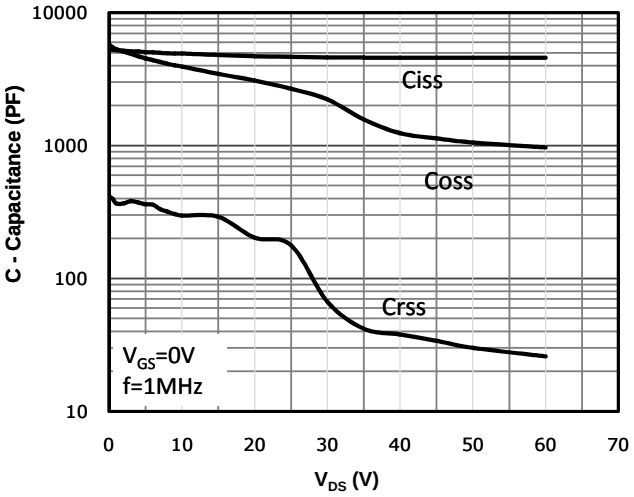


Fig 7: Gate ChargeCharacteristics

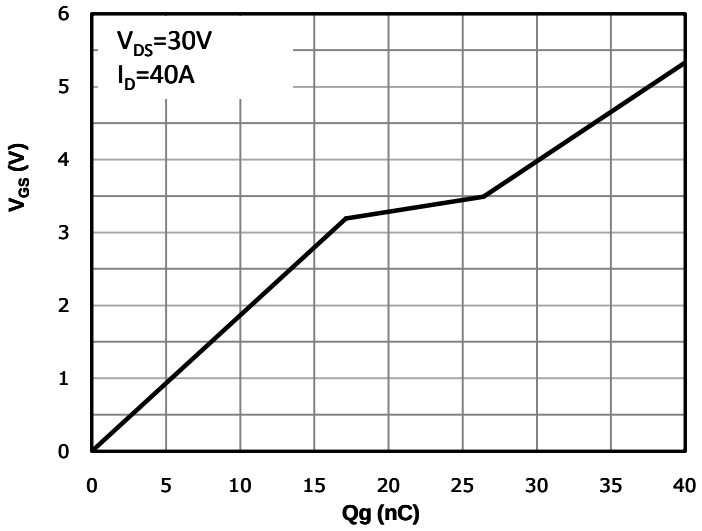


Fig 8: Body-diode Forward Characteristics

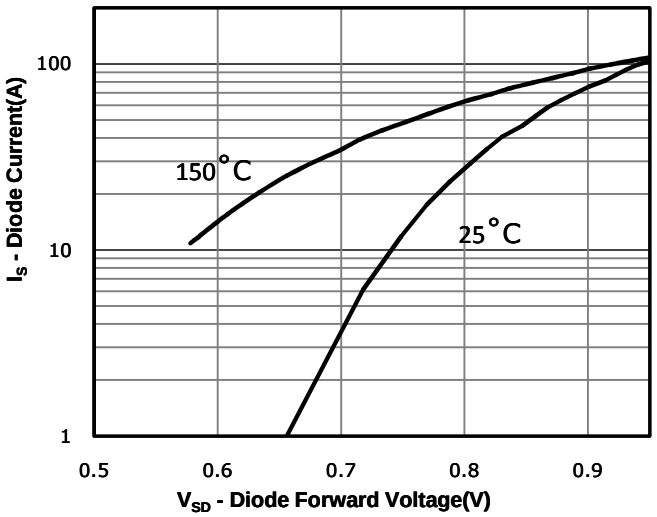


Fig 9: Power Dissipation

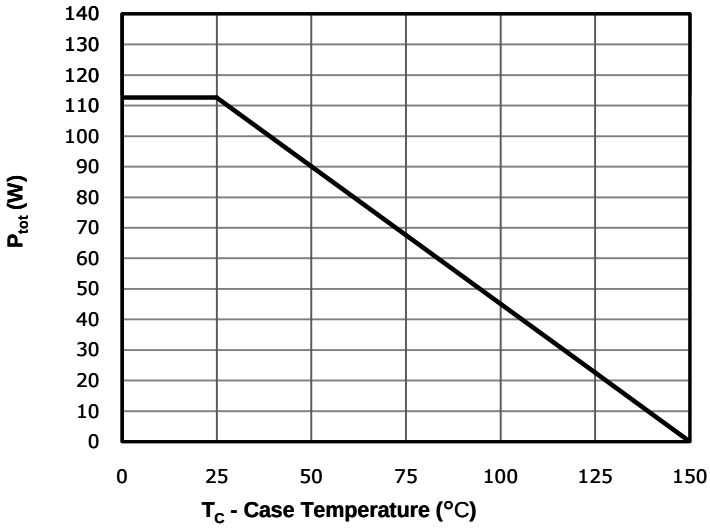


Fig 10: Drain Current Derating

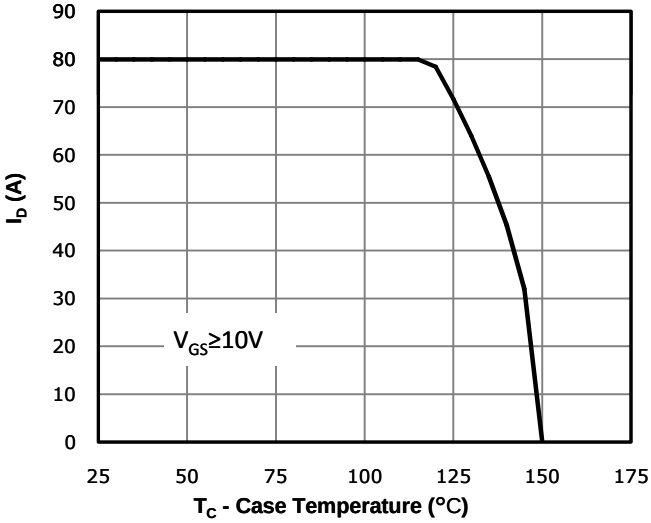


Fig 11: Safe Operating Area

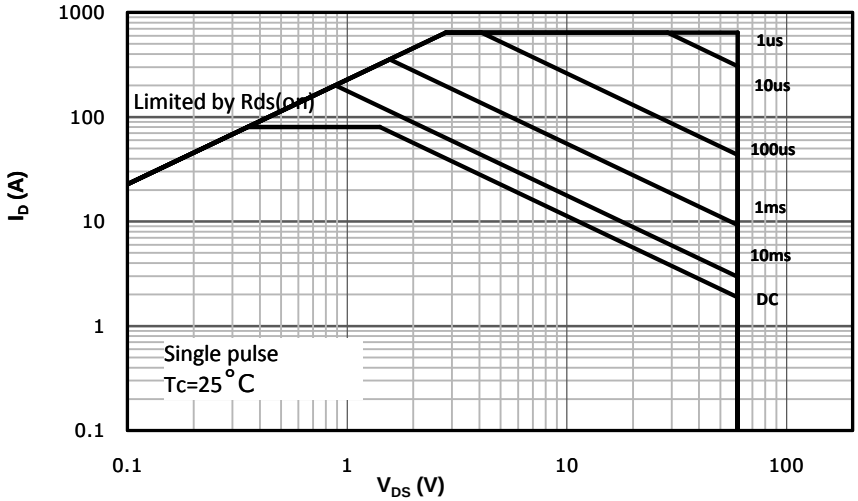
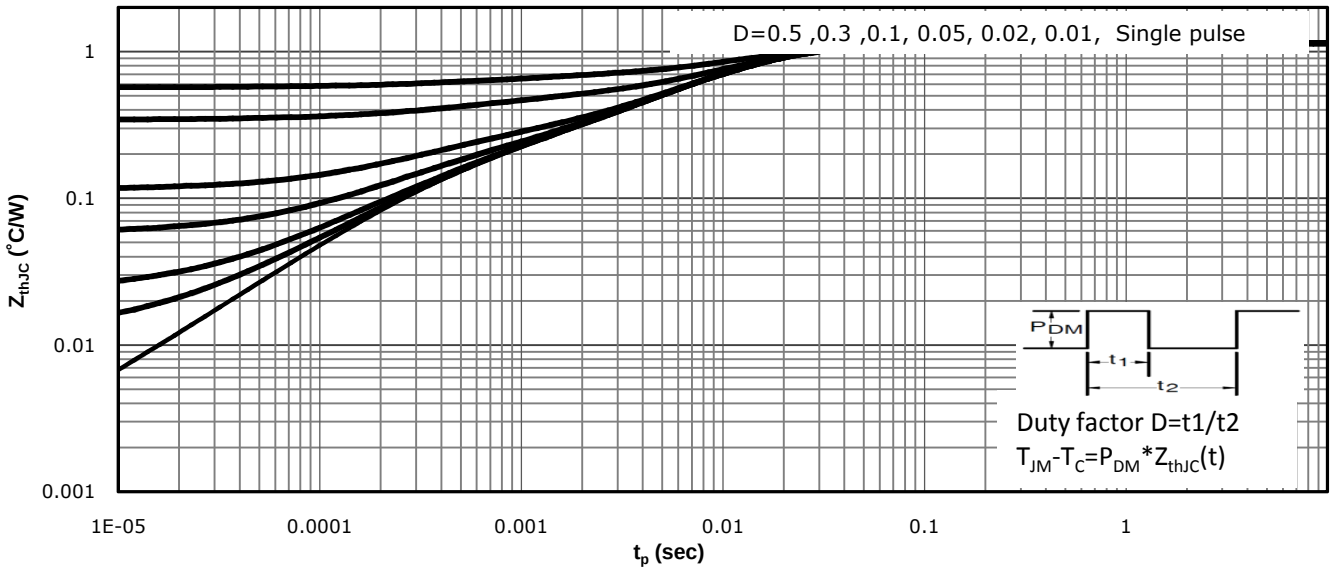
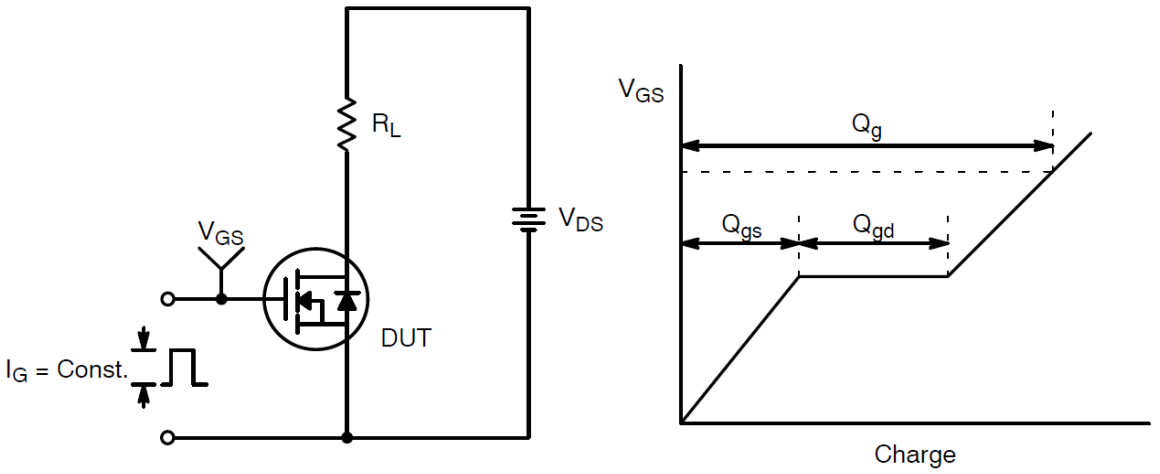


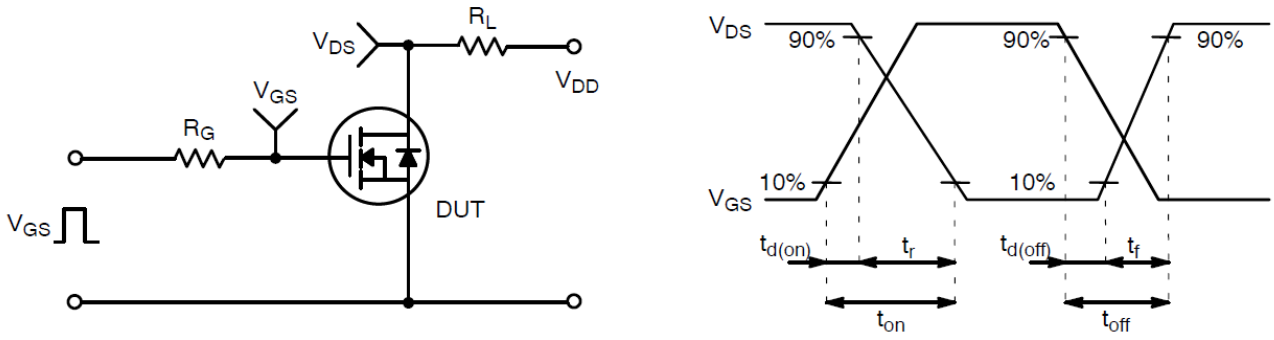
Fig 12: Max. Transient Thermal Impedance



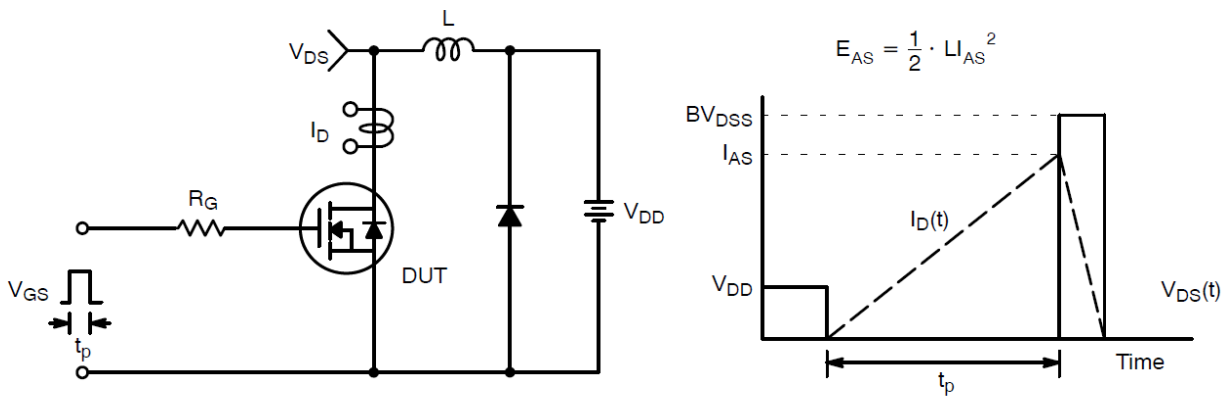
Test Circuit and Waveform:



Gate Charge Test Circuit & Waveform

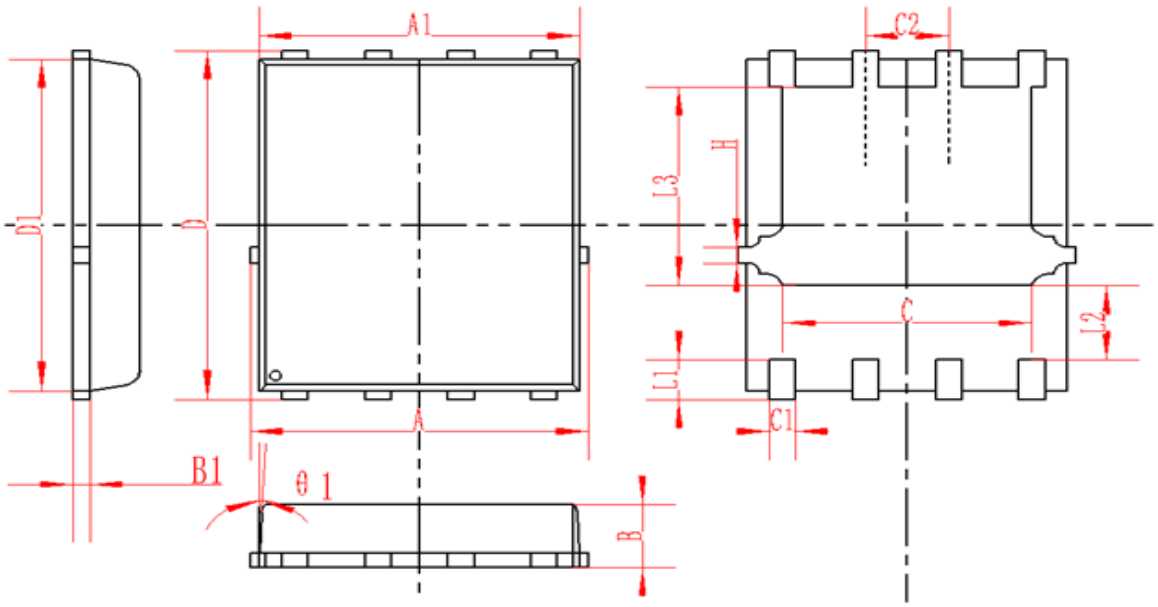


Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching Test Circuit & Waveforms

DFN5X6-8L Package Information



SYMBOL	MM			INCH		
	MIN	NOM	MAX	MIN	NOM	MAX
A	4.95	5	5.05	0.195	0.197	0.199
A1	4.82	4.9	4.98	0.190	0.193	0.196
D	5.98	6	6.02	0.235	0.236	0.237
D1	5.67	5.75	5.83	0.223	0.226	0.230
B	0.9	0.95	1	0.035	0.037	0.039
B1	0.254REF			0.010REF		
C	3.95	4	4.05	0.156	0.157	0.159
C1	0.35	0.4	0.45	0.014	0.016	0.018
C2	1.27TYP			0.5TYP		
θ1	8°	10°	12°	8°	10°	12°
L1	0.63	0.64	0.65	0.025	0.025	0.026
L2	1.2	1.3	1.4	0.047	0.051	0.055
L3	3.415	3.42	3.425	0.134	0.135	0.135
H	0.24	0.25	0.26	0.009	0.010	0.010

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