

100V N-Ch Power MOSFET

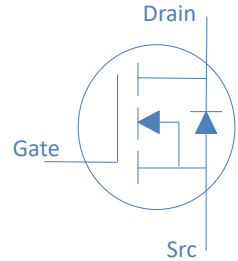
Feature

- ◇ High Speed Power Switching
- ◇ Enhanced Body diode dv/dt capability
- ◇ Enhanced Avalanche Ruggedness
- ◇ 100% UIS Tested, 100% Rg Tested
- ◇ Lead Free

Application

- ◇ Synchronous Rectification in SMPS
- ◇ Hard Switching and High Speed Circuit
- ◇ Power Tools
- ◇ UPS
- ◇ Motor Control

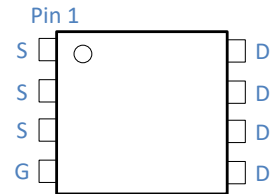
V_{DS}	100	V
$R_{DS(on),typ}$	3.1	mΩ
I_D (Silicon Limited)	144	A
I_D (Package Limited)	60	A



DFN5x6



Part Number	Package	Marking
HGN035N10A	DFN5x6	GN035N10A



Absolute Maximum Ratings at $T_J=25^{\circ}\text{C}$ (unless otherwise specified)

Parameter	Symbol	Conditions	Value	Unit
Continuous Drain Current (Silicon Limited)	I_D	$T_C=25^{\circ}\text{C}$	144	A
		$T_C=100^{\circ}\text{C}$	91	
Continuous Drain Current (Package Limited)		$T_C=25^{\circ}\text{C}$	60	
Drain to Source Voltage	V_{DS}	-	100	V
Gate to Source Voltage	V_{GS}	-	± 20	V
Pulsed Drain Current	I_{DM}	-	520	A
Avalanche Energy, Single Pulse	E_{AS}	$L=0.1\text{mH}, T_C=25^{\circ}\text{C}$	180	mJ
Power Dissipation	P_D	$T_C=25^{\circ}\text{C}$	144	W
Operating and Storage Temperature	T_J, T_{stg}	-	-55 to 150	$^{\circ}\text{C}$

Absolute Maximum Ratings

Parameter	Symbol	Max	Unit
Thermal Resistance Junction-Case	$R_{\theta JC}$	0.87	$^{\circ}\text{C}/\text{W}$
Thermal Resistance Junction-Ambient	$R_{\theta JA}$	55	$^{\circ}\text{C}/\text{W}$

Electrical Characteristics at $T_j=25^\circ\text{C}$ (unless otherwise specified)
Static Characteristics

Parameter	Symbol	Conditions	Value			Unit
			min	typ	max	
Drain to Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu A$	100	-	-	V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{GS}=V_{DS}, I_D=250\mu A$	2	2.8	4	
Zero Gate Voltage Drain Current	I_{DSS}	$V_{GS}=0V, V_{DS}=100V, T_j=25^\circ\text{C}$	-	-	1	μA
		$V_{GS}=0V, V_{DS}=100V, T_j=100^\circ\text{C}$	-	-	100	
Gate to Source Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	± 100	nA
Drain to Source on Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=20A$	-	3.1	3.7	$m\Omega$
Transconductance	g_{fs}	$V_{DS}=5V, I_D=20A$	-	70	-	S
Gate Resistance	R_G	$V_{GS}=0V, V_{DS}$ Open, $f=1\text{MHz}$	-	0.6	-	Ω

Dynamic Characteristics

Input Capacitance	C_{iss}	$V_{GS}=0V, V_{DS}=50V, f=1\text{MHz}$	-	5995	-	pF
Output Capacitance	C_{oss}		-	923	-	
Reverse Transfer Capacitance	C_{rss}		-	13.8	-	
Total Gate Charge	$Q_g(10V)$	$V_{DD}=50V, I_D=20A, V_{GS}=10V$	-	87	-	nC
Gate to Source Charge	Q_{gs}		-	22	-	
Gate to Drain (Miller) Charge	Q_{gd}		-	21	-	
Turn on Delay Time	$t_{d(on)}$	$V_{DD}=50V, I_D=20A, V_{GS}=10V, R_G=10\Omega,$	-	24	-	ns
Rise time	t_r		-	18	-	
Turn off Delay Time	$t_{d(off)}$		-	36	-	
Fall Time	t_f		-	9	-	

Reverse Diode Characteristics

Diode Forward Voltage	V_{SD}	$V_{GS}=0V, I_F=20A$	-	0.9	1.2	V
Reverse Recovery Time	t_{rr}	$V_R=50V, I_F=20A, di_F/dt=100A/\mu s$	-	71	-	ns
Reverse Recovery Charge	Q_{rr}		-	114	-	nC

Fig 1. Typical Output Characteristics

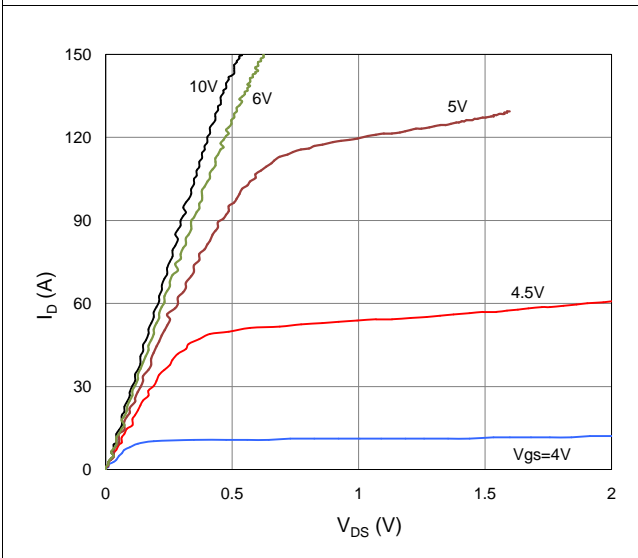


Figure 2. On-Resistance vs. Gate-Source Voltage

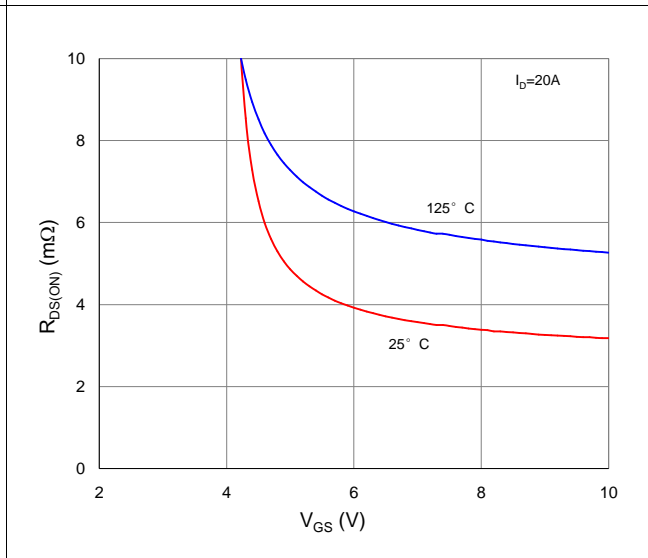


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

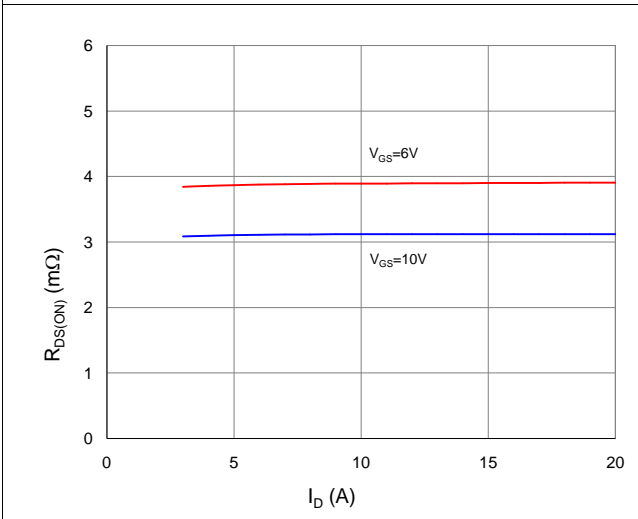


Figure 4. Normalized On-Resistance vs. Junction Temperature

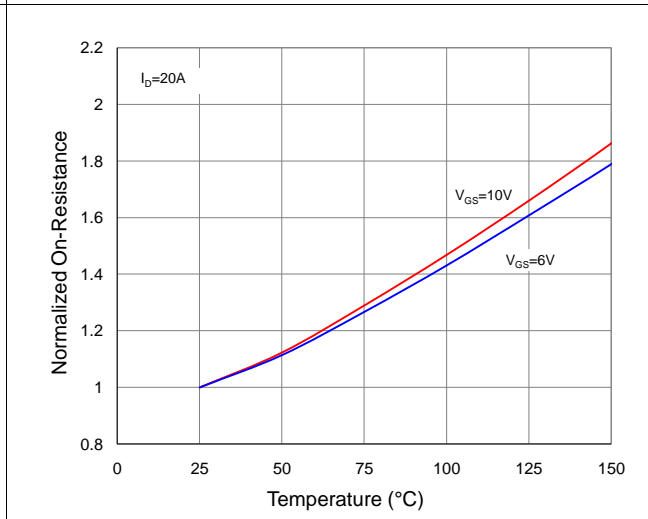


Figure 5. Typical Transfer Characteristics

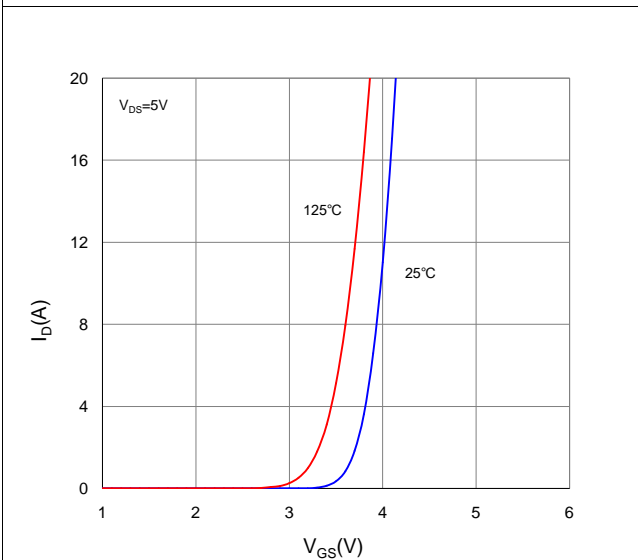


Figure 6. Typical Source-Drain Diode Forward Voltage

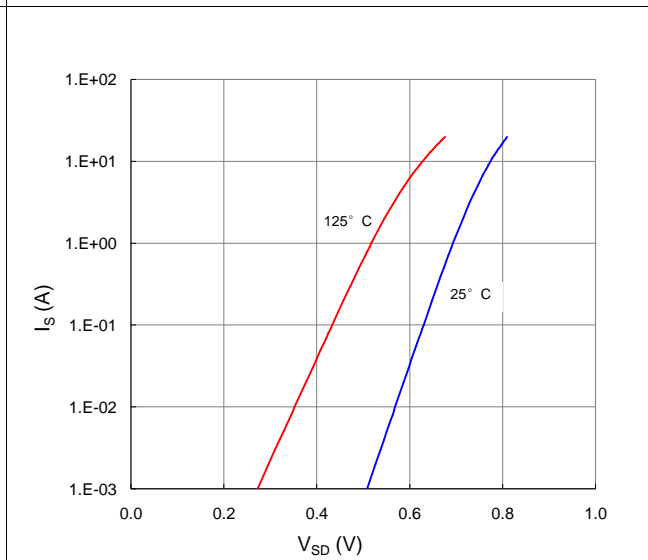


Figure 7. Typical Gate-Charge vs. Gate-to-Source Voltage

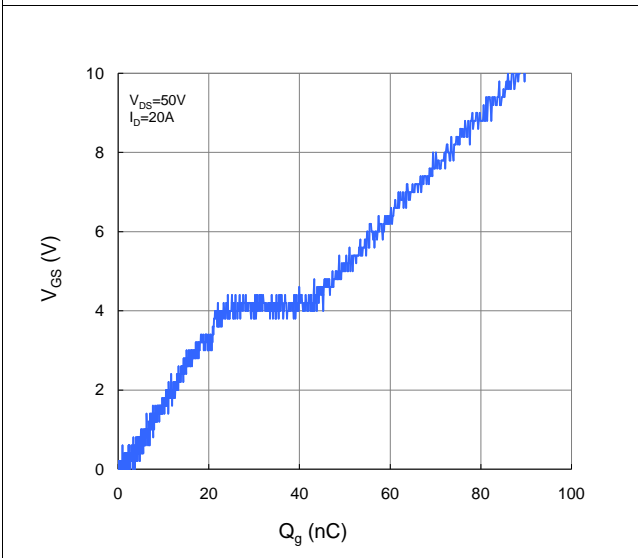


Figure 8. Typical Capacitance vs. Drain-to-Source Voltage

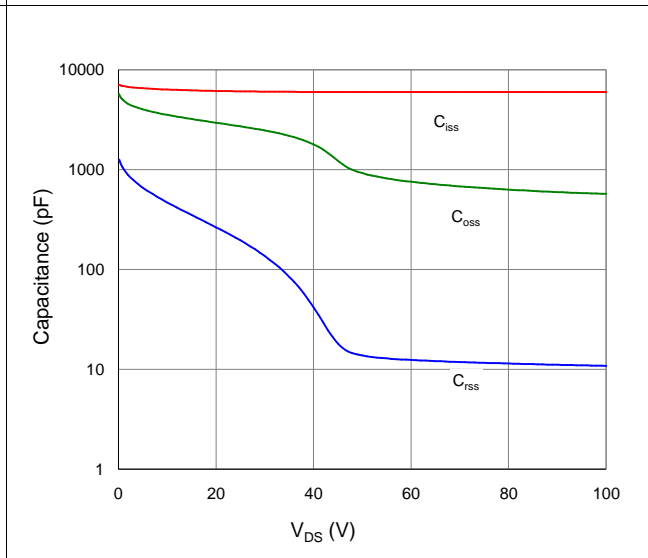


Figure 9. Maximum Safe Operating Area

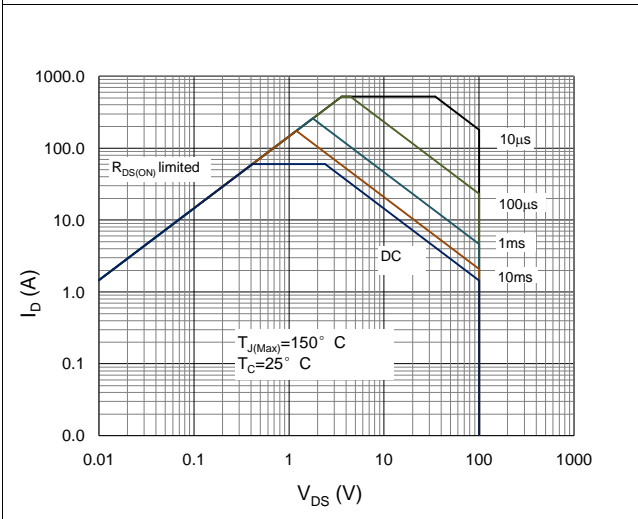


Figure 10. Maximum Drain Current vs. Case Temperature

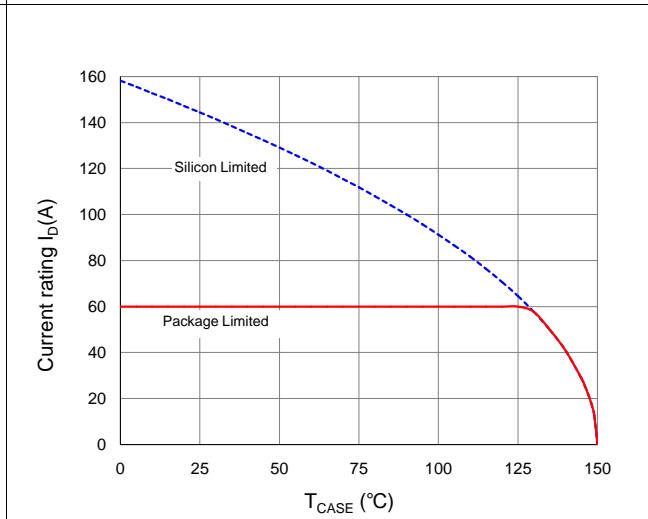
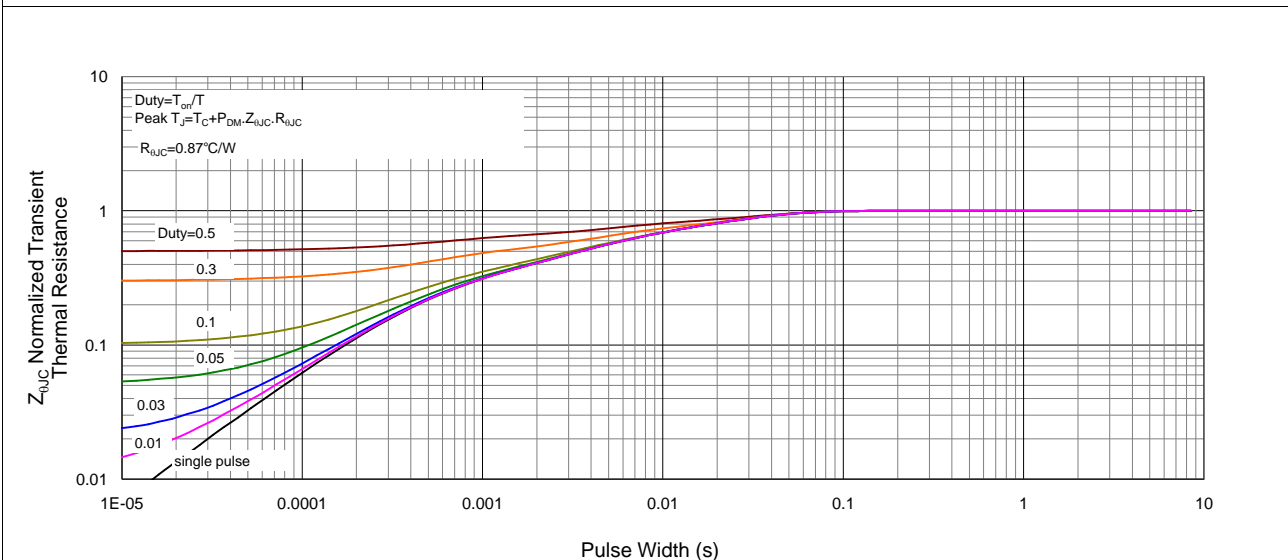
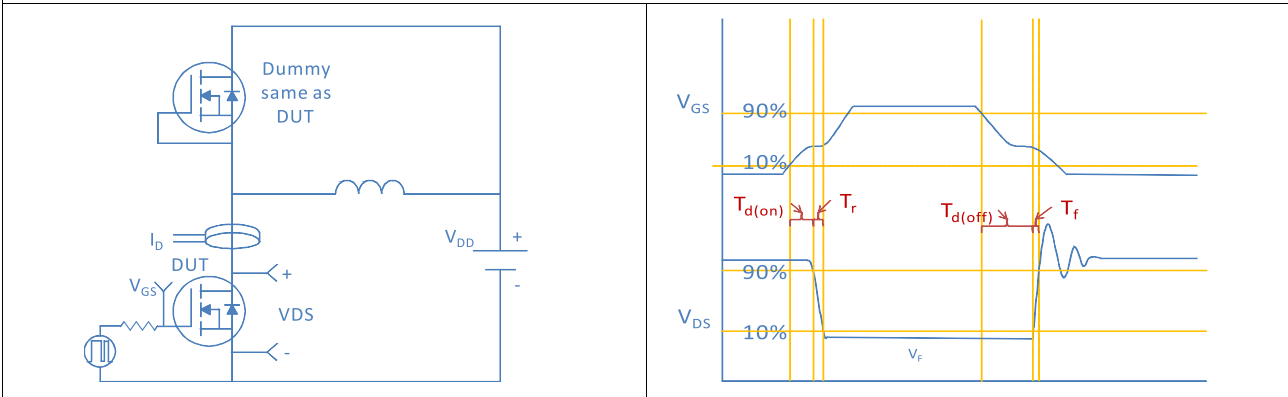


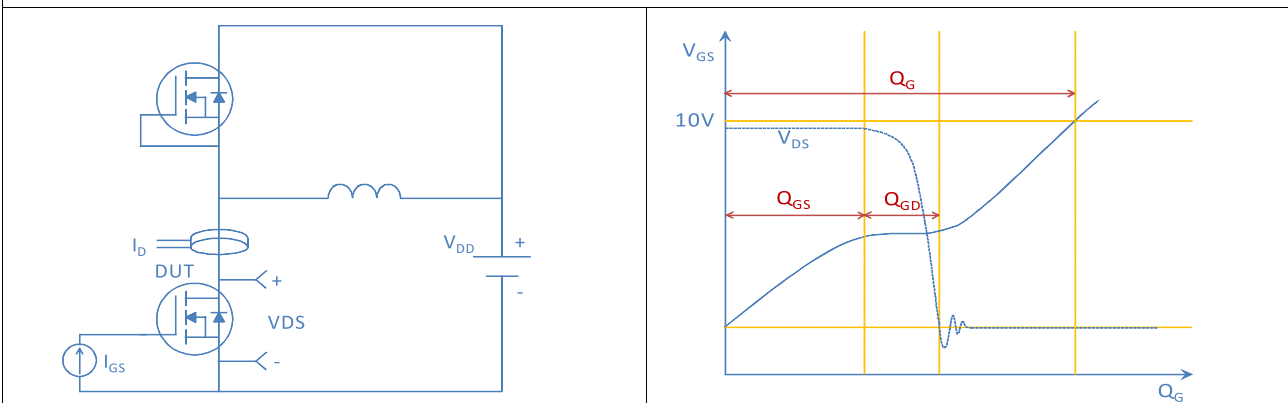
Figure 11. Normalized Maximum Transient Thermal Impedance, Junction-to-Case



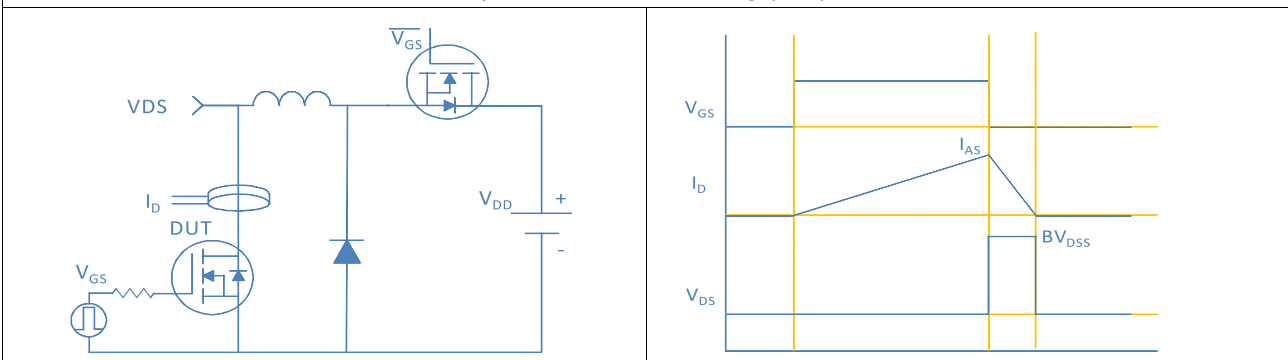
Inductive switching Test



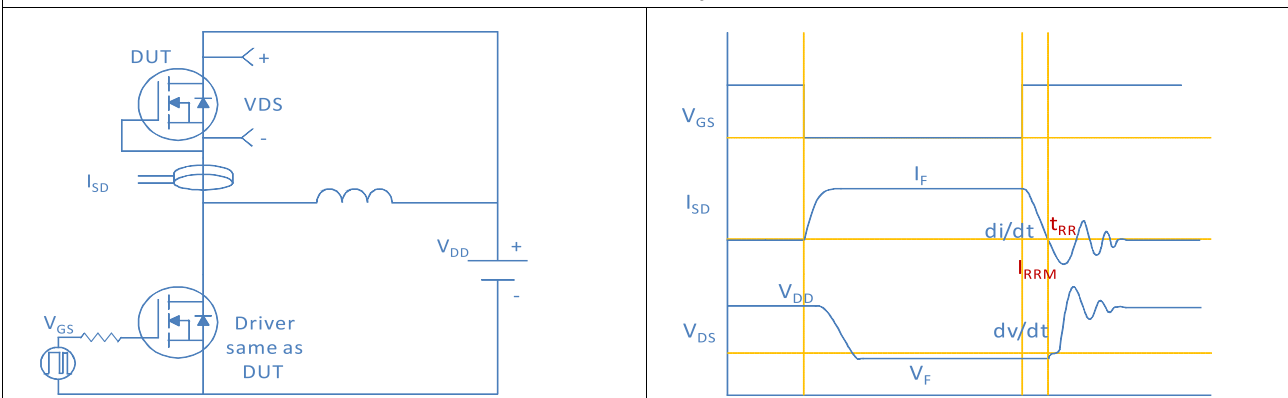
Gate Charge Test



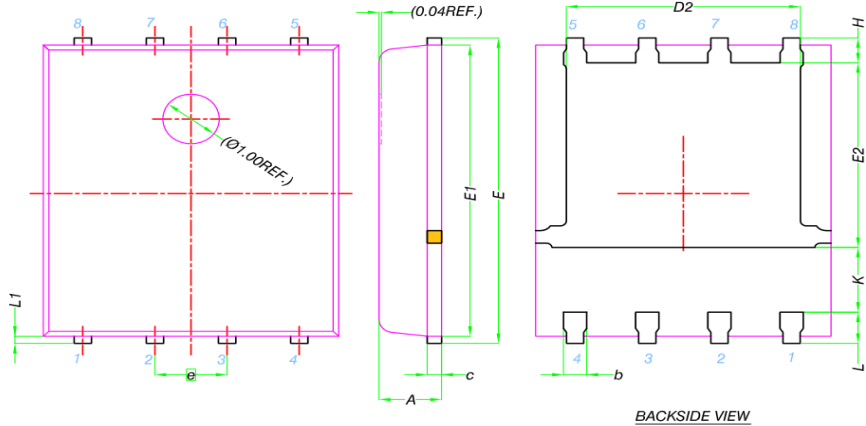
Uclamped Inductive Switching (UIS) Test



Diode Recovery Test



DFN5x6_P, 8 Leads



DIM.	MILLIMETERS		
	MIN.	NOM.	MAX.
A	1.00	1.10	1.20
A1	0	---	0.05
b	0.33	0.40	0.50
c	0.20	0.25	0.30
D1	5.00	5.20	5.40
D2	3.80	4.10	4.25
E	6.00	6.15	6.30
E1	5.76	5.86	5.96
E2	3.52	3.72	3.92
e	1.27 BSC		
H	0.40	0.50	0.60
K	1.10	---	---
L	0.50	0.60	0.70
L1	0.08	0.15	0.22
α	0°	---	12°

