

## 100V N-Ch Power MOSFET

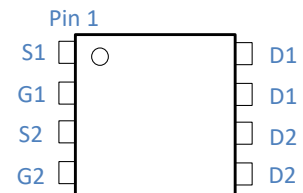
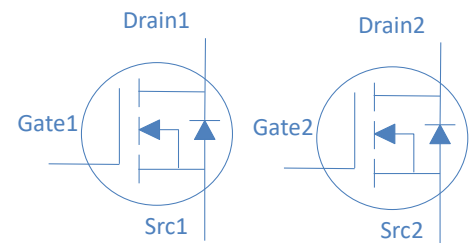
### Feature

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

### Application

- ◇ Synchronous Rectification in SMPS
- ◇ Hard Switching and High Speed Circuit
- ◇ DC/DC in Telecoms and Industrial

$V_{DS}$		100	V
$R_{DS(on),typ}$	$V_{GS}=10V$	21.5	m $\Omega$
$R_{DS(on),typ}$	$V_{GS}=4.5V$	28	m $\Omega$
$I_D$ (Silicon Limited)		23	A



Part Number	Package	Marking
HGN230A10AL	DFN5*6	GN230A10AL

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

Parameter	Symbol	Conditions	Value	Unit
Continuous Drain Current (Silicon Limited)	$I_D$	$T_C=25^\circ\text{C}$	23	A
		$T_C=100^\circ\text{C}$	15	
Drain to Source Voltage	$V_{DS}$	-	100	V
Gate to Source Voltage	$V_{GS}$	-	$\pm 20$	V
Pulsed Drain Current	$I_{DM}$	-	80	A
Avalanche Energy, Single Pulse	$E_{AS}$	$L=0.1\text{mH}, T_C=25^\circ\text{C}$	5	mJ
Power Dissipation	$P_D$	$T_C=25^\circ\text{C}$	26	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-Ambient	$R_{\theta JA}$	65	$^\circ\text{C/W}$
Thermal Resistance Junction-Case	$R_{\theta JC}$	4.8	$^\circ\text{C/W}$

**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	$V_{GS(th)}$	$V_{GS}=V_{DS}, I_D=250\mu A$	1.4	1.6	2.4	
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{GS}=0V, V_{DS}=100V, T_J=25^\circ\text{C}$	-	-	1	$\mu A$
		$V_{GS}=0V, V_{DS}=100V, T_J=100^\circ\text{C}$	-	-	100	
Gate to Source Leakage Current	$I_{GSS}$	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	$\pm 100$	nA
Drain to Source on Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=10A$	-	21.5	25	$m\Omega$
		$V_{GS}=4.5V, I_D=7A$	-	28	35	
Transconductance	$g_{fs}$	$V_{DS}=5V, I_D=10A$	-	22	-	S
Gate Resistance	$R_G$	$V_{GS}=0V, V_{DS}$ Open, $f=1\text{MHz}$	-	1.8	-	$\Omega$

**Dynamic Characteristics**

Input Capacitance	$C_{iss}$	$V_{GS}=0V, V_{DS}=50V, f=1\text{MHz}$	-	596	-	pF
Output Capacitance	$C_{oss}$		-	117	-	
Reverse Transfer Capacitance	$C_{riss}$		-	6.6	-	
Total Gate Charge	$Q_g(10V)$	$V_{DD}=50V, I_D=10A, V_{GS}=10V$	-	12	-	nC
Total Gate Charge	$Q_g(4.5V)$		-	6.4	-	
Gate to Source Charge	$Q_{gs}$		-	1.6	-	
Gate to Drain (Miller) Charge	$Q_{gd}$		-	3.4	-	
Turn on Delay Time	$t_{d(on)}$	$V_{DD}=50V, I_D=10A, V_{GS}=10V, R_G=10\Omega,$	-	6	-	ns
Rise time	$t_r$		-	3	-	
Turn off Delay Time	$t_{d(off)}$		-	11	-	
Fall Time	$t_f$		-	3	-	

**Reverse Diode Characteristics**

Diode Forward Voltage	$V_{SD}$	$V_{GS}=0V, I_F=20A$	-	0.9	1.2	V
Reverse Recovery Time	$t_{rr}$	$V_R=50V, I_F=10A, di_F/dt=500A/\mu s$	-	28	-	ns
Reverse Recovery Charge	$Q_{rr}$		-	91	-	nC

Fig 1. Typical Output Characteristics

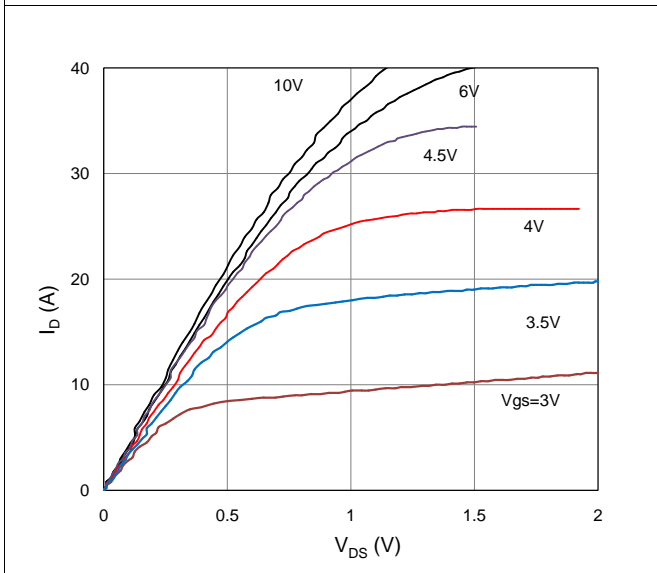


Figure 2. On-Resistance vs. Gate-Source Voltage

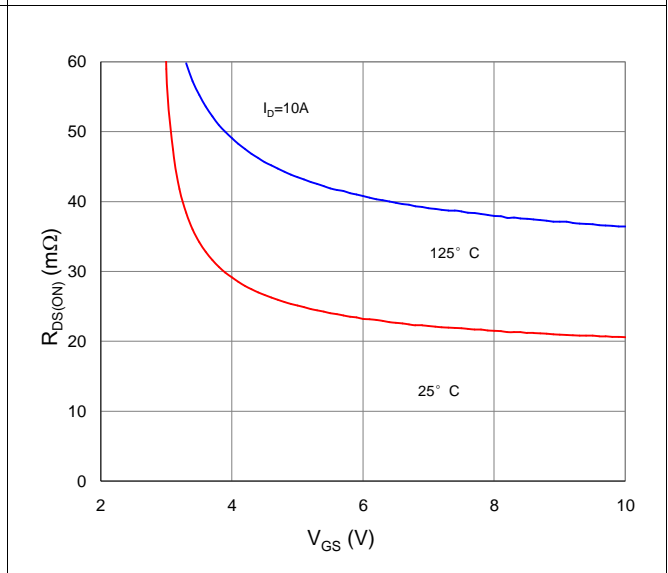


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

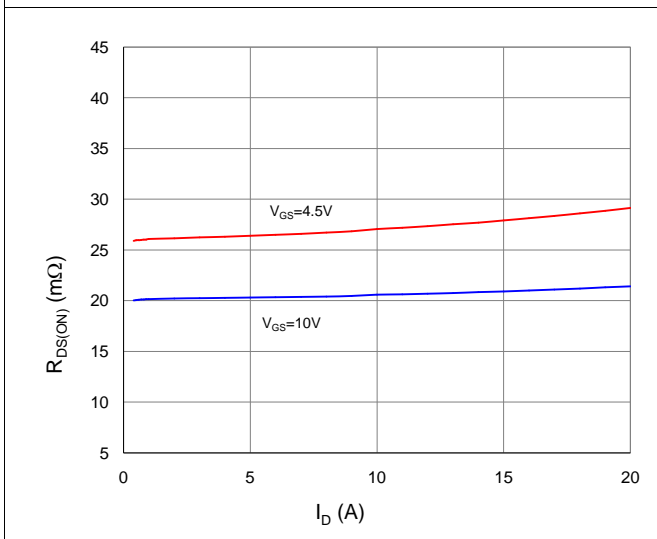


Figure 4. Normalized On-Resistance vs. Junction Temperature

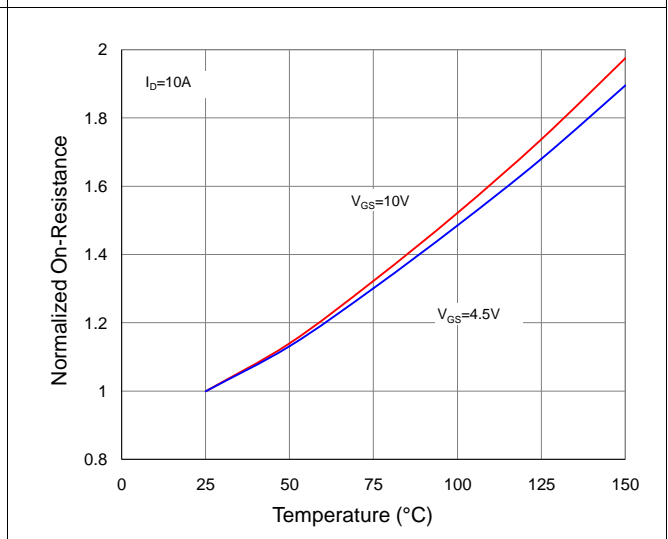


Figure 5. Typical Transfer Characteristics

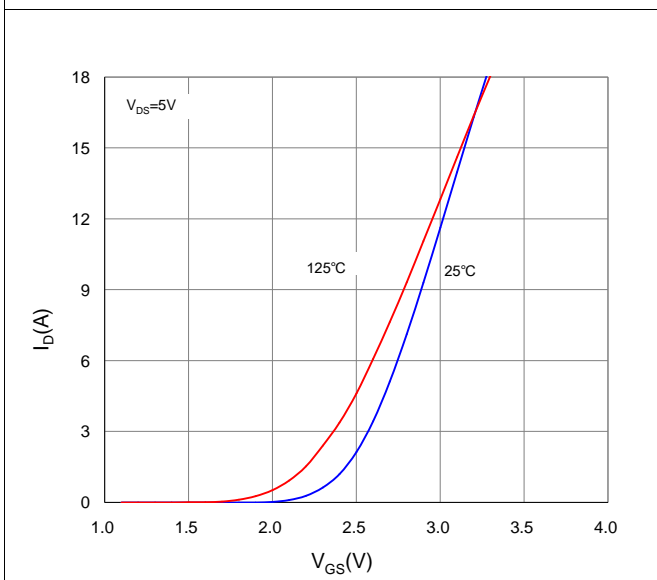


Figure 6. Typical Source-Drain Diode Forward Voltage

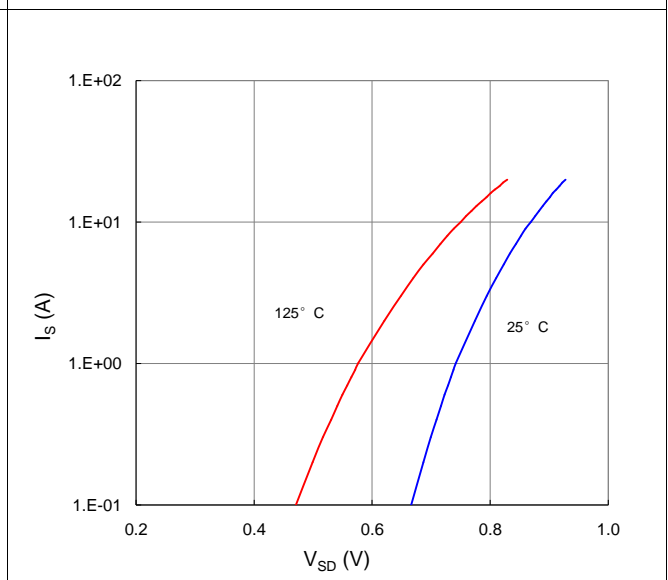


Figure 7. Typical Gate-Charge vs. Gate-to-Source Voltage

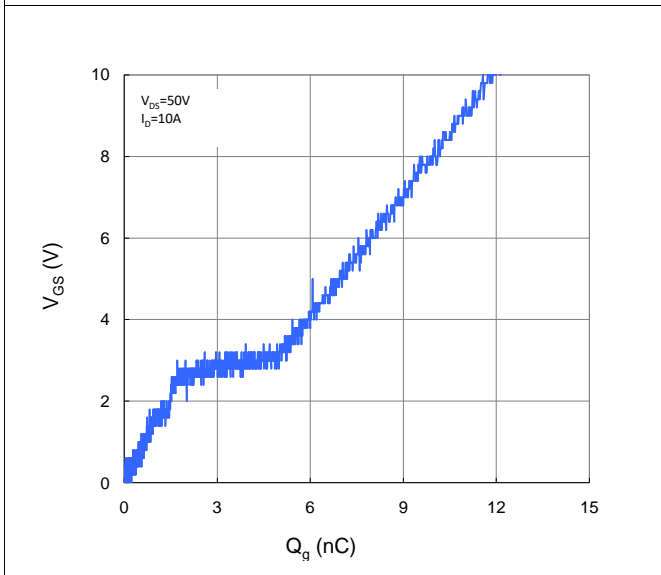


Figure 8. Typical Capacitance vs. Drain-to-Source Voltage

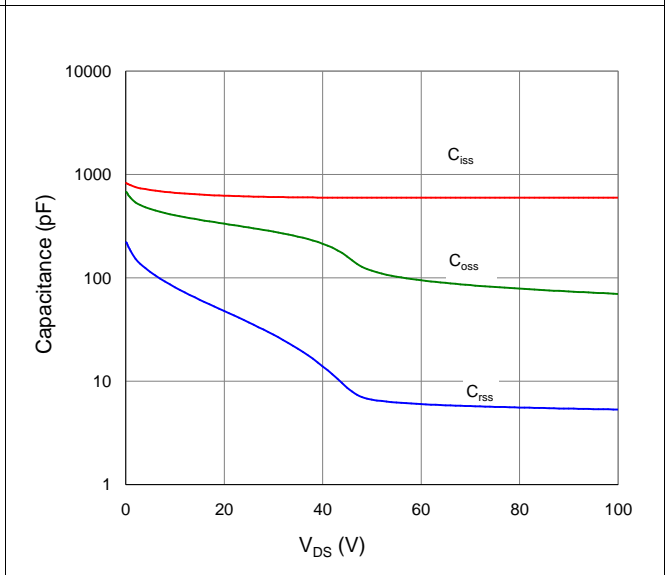


Figure 9. Maximum Safe Operating Area

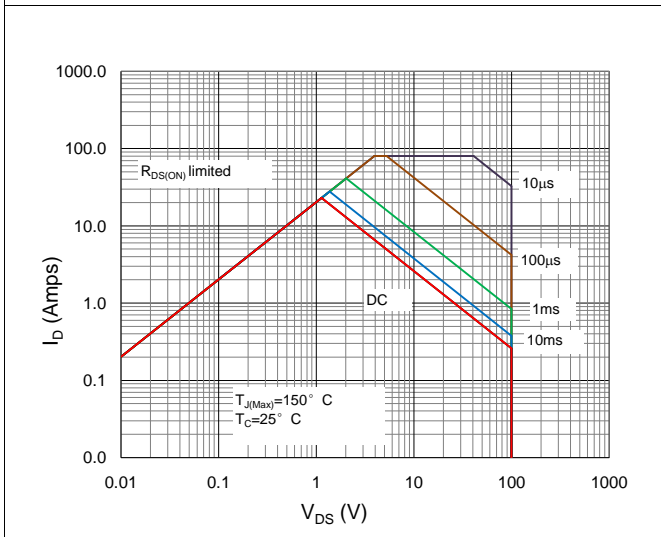


Figure 10. Maximum Drain Current vs. Case Temperature

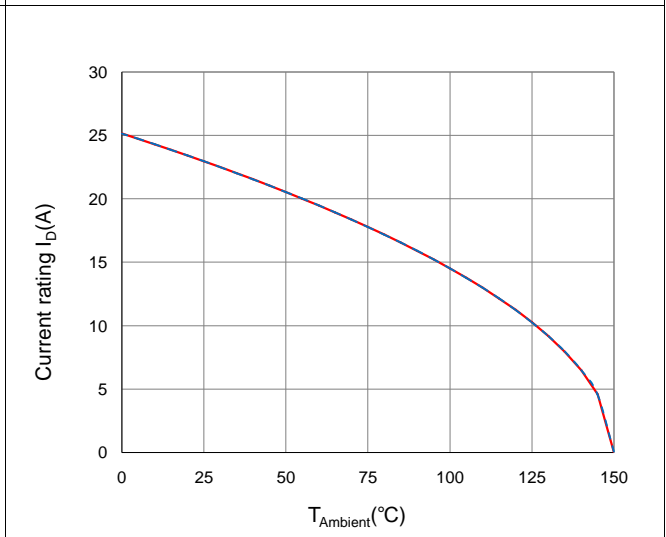
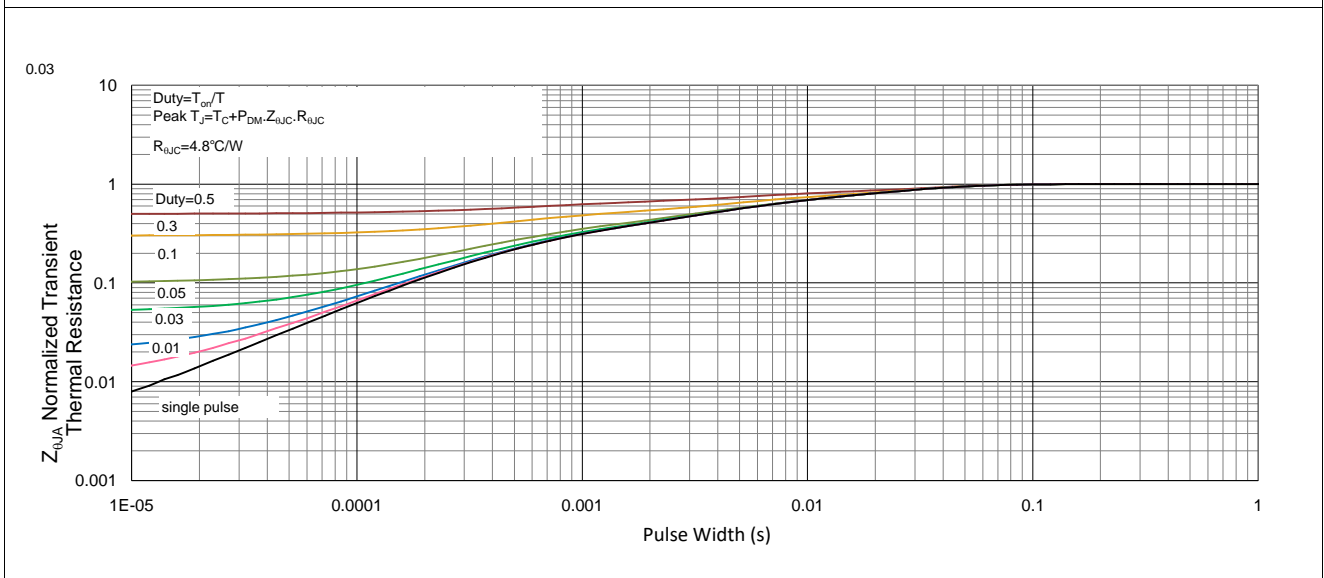
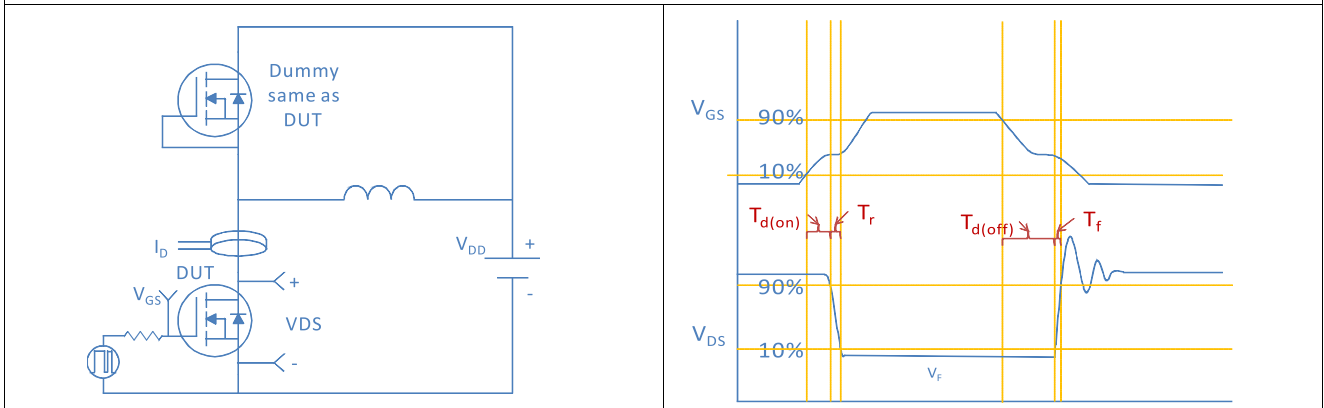


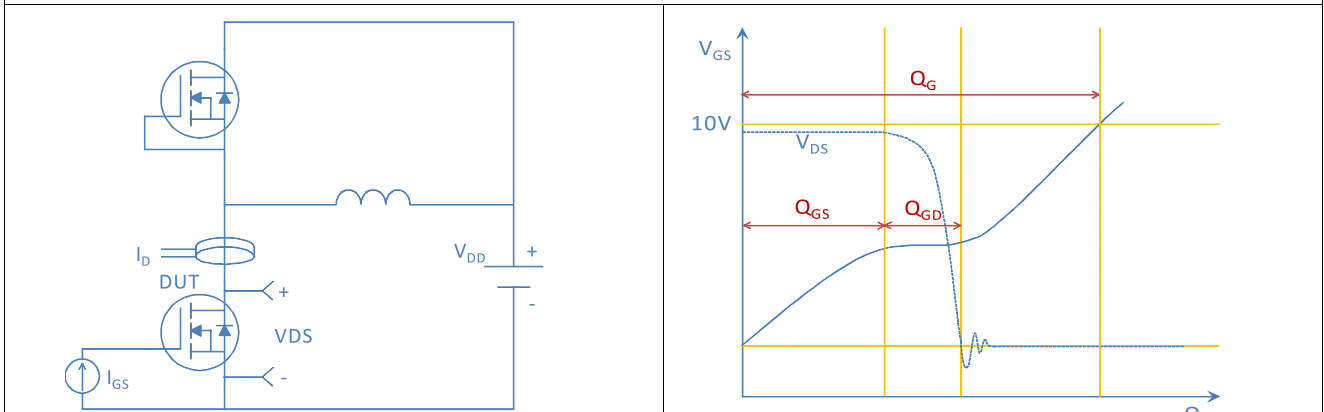
Figure 11. Normalized Maximum Transient Thermal Impedance, Junction-to-Ambient



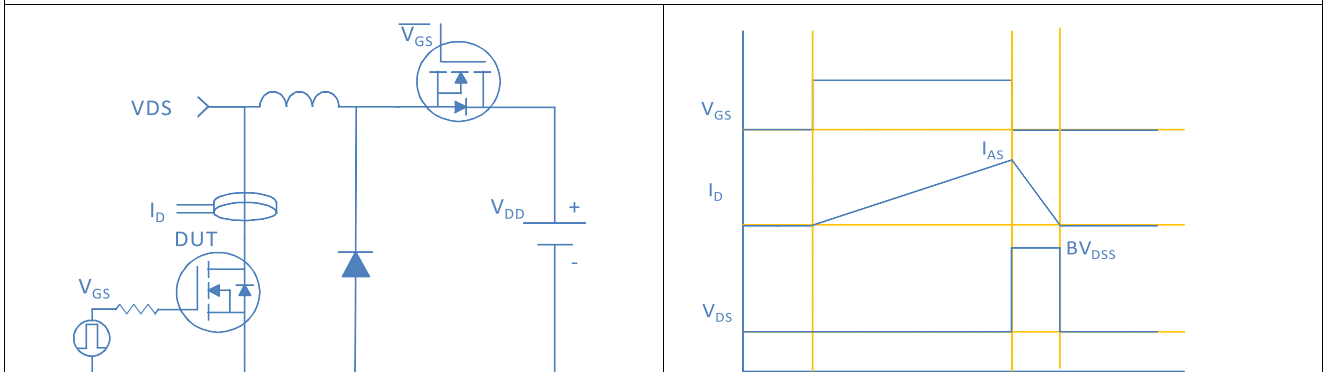
Inductive switching Test



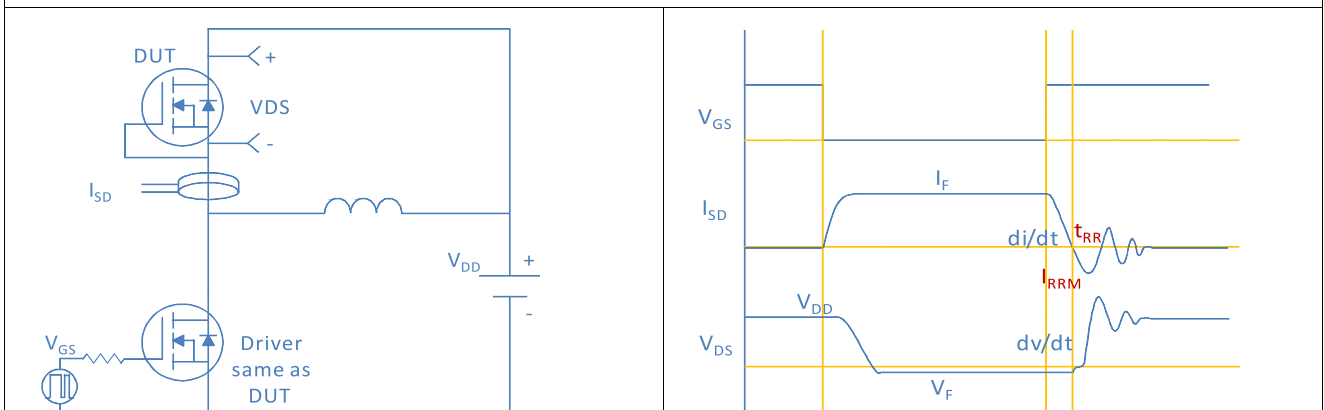
Gate Charge Test



Unclamped Inductive Switching (UIS) Test

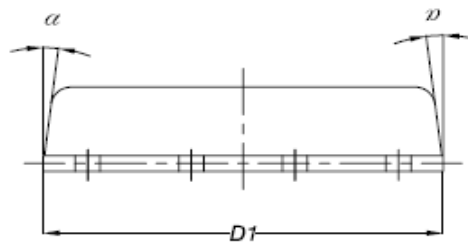
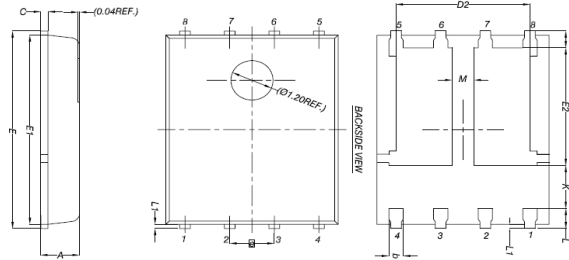


Diode Recovery Test



Package Outline

DFN5x6\_P, 8 Leads



DIM.	MILLIMETERS		
	MIN.	NOM.	MAX.
A	0.90	1.00	1.10
b	0.33	0.41	0.51
C	0.20	0.25	0.30
D1	4.80	4.90	5.00
D2	3.61	3.81	3.96
E	5.90	6.00	6.10
E1	5.70	5.75	5.80
E2	3.38	3.58	3.78
e	1.27 BSC		
H	0.41	0.51	0.61
K	1.10	-	-
L	0.51	0.61	0.71
L1	0.06	0.13	0.20
M	0.50	-	-
α	0°	-	12°

Land Pattern  
(Only for Reference)

