

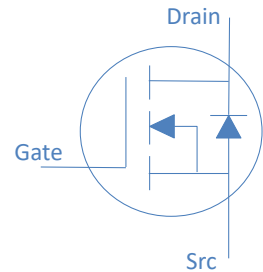
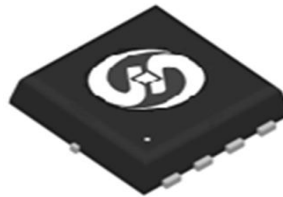
**65V N-Ch Power MOSFET**
**Feature**

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

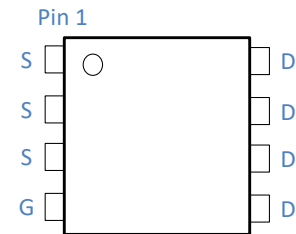
$V_{DS}$	65	V
$R_{DS(on),typ}$	7.8	m $\Omega$
$I_D$ (Silicon Limited)	38	A
$I_D$ (Package Limited)	36	A

**Application**

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

**DFN3.3x3.3**


Part Number	Package	Marking
HGM090NE6A	DFN 3.3x3.3	GM090NE6A


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

Parameter	Symbol	Conditions	Value	Unit
Continuous Drain Current (Silicon Limited)	$I_D$	$T_C=25^{\circ}\text{C}$	38	A
		$T_C=100^{\circ}\text{C}$	24	
		$T_C=25^{\circ}\text{C}$	36	
Continuous Drain Current (Package Limited)		$T_C=25^{\circ}\text{C}$	36	
Drain to Source Voltage	$V_{DS}$	-	65	V
Gate to Source Voltage	$V_{GS}$	-	$\pm 20$	V
Pulsed Drain Current	$I_{DM}$	-	250	A
Avalanche Energy, Single Pulse	$E_{AS}$	$L=0.4\text{mH}, T_C=25^{\circ}\text{C}$	45	mJ
Power Dissipation	$P_D$	$T_C=25^{\circ}\text{C}$	25	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	$R_{\theta JA}$	55	$^{\circ}\text{C}/\text{W}$
Thermal Resistance Junction-Case	$R_{\theta JC}$	5	$^{\circ}\text{C}/\text{W}$

**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	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu A$	65	-	-	V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{GS}=V_{DS}, I_D=250\mu A$	2.0	2.9	4.0	
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{GS}=0V, V_{DS}=60V, T_j=25^\circ\text{C}$	-	-	1	$\mu A$
		$V_{GS}=0V, V_{DS}=60V, T_j=100^\circ\text{C}$	-	-	100	
Gate to Source Leakage Current	$I_{GSS}$	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	$\pm 100$	nA
Drain to Source on Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=10A$	-	7.8	9.5	$m\Omega$
Transconductance	$g_{fs}$	$V_{DS}=5V, I_D=10A$	-	28	-	S
Gate Resistance	$R_G$	$V_{GS}=0V, V_{DS}$ Open, $f=1\text{MHz}$	-	1.3	-	$\Omega$

**Dynamic Characteristics**

Input Capacitance	$C_{iss}$	$V_{GS}=0V, V_{DS}=30V, f=1\text{MHz}$	-	1331	-	$\mu F$
Output Capacitance	$C_{oss}$		-	567	-	
Reverse Transfer Capacitance	$C_{rss}$		-	30	-	
Total Gate Charge	$Q_g(10V)$	$V_{DD}=30V, I_D=10A, V_{GS}=10V$	-	20	-	nC
Gate to Source Charge	$Q_{gs}$		-	5	-	
Gate to Drain (Miller) Charge	$Q_{gd}$		-	5.5	-	
Turn on Delay Time	$t_{d(on)}$	$V_{DD}=30V, I_D=10A, V_{GS}=10V,$ $R_G=10\Omega,$	-	8	-	ns
Rise time	$t_r$		-	4	-	
Turn off Delay Time	$t_{d(off)}$		-	23	-	
Fall Time	$t_f$		-	5	-	

**Reverse Diode Characteristics**

Diode Forward Voltage	$V_{SD}$	$V_{GS}=0V, I_F=20A$	-	0.9	1.2	V
Reverse Recovery Time	$t_{rr}$	$V_R=30V, I_F=10A, di_F/dt=100A/\mu s$	-	35	-	ns
Reverse Recovery Charge	$Q_{rr}$		-	27	-	nC

Fig 1. Typical Output Characteristics

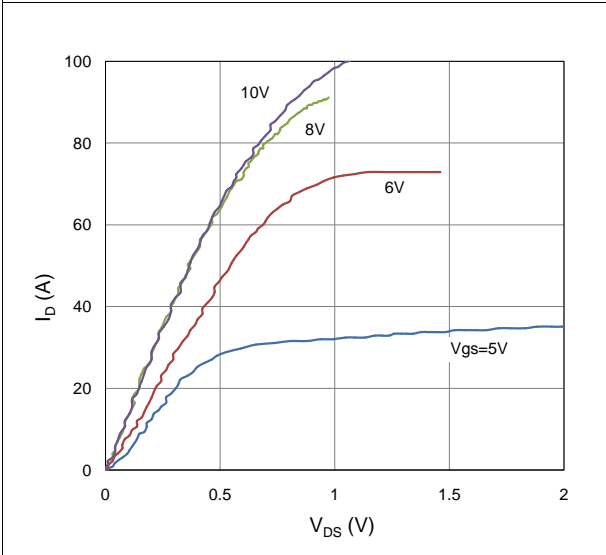


Figure 2. On-Resistance vs. Gate-Source Voltage

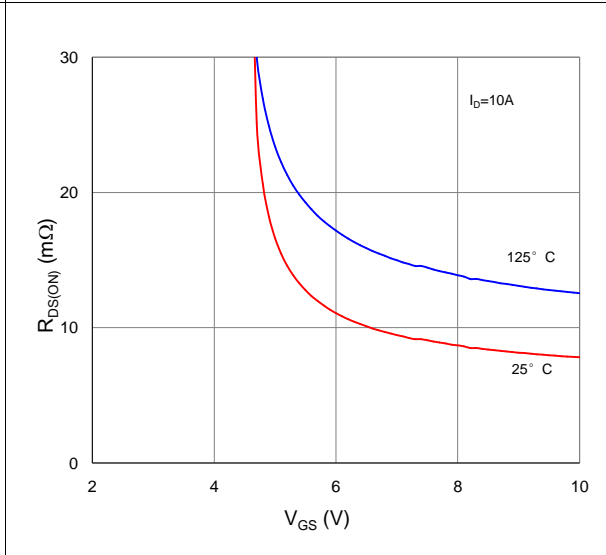


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

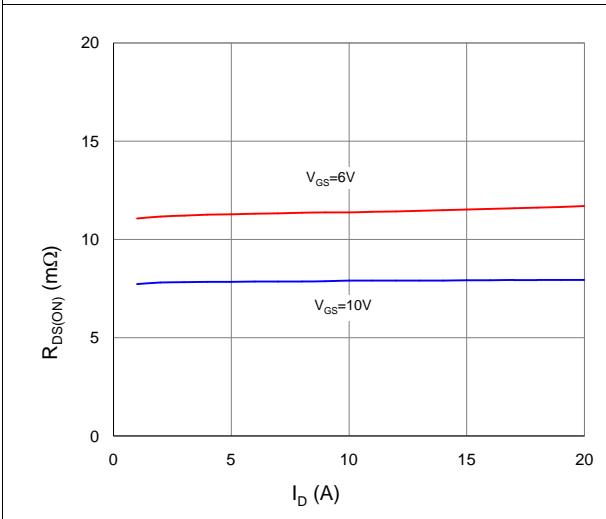


Figure 4. Normalized On-Resistance vs. Junction Temperature

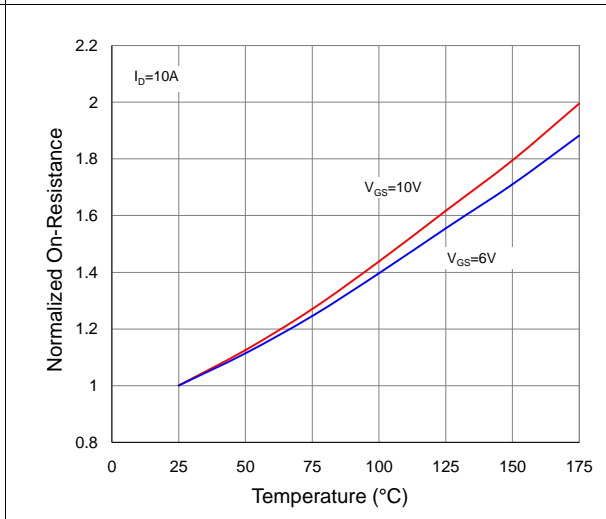


Figure 5. Typical Transfer Characteristics

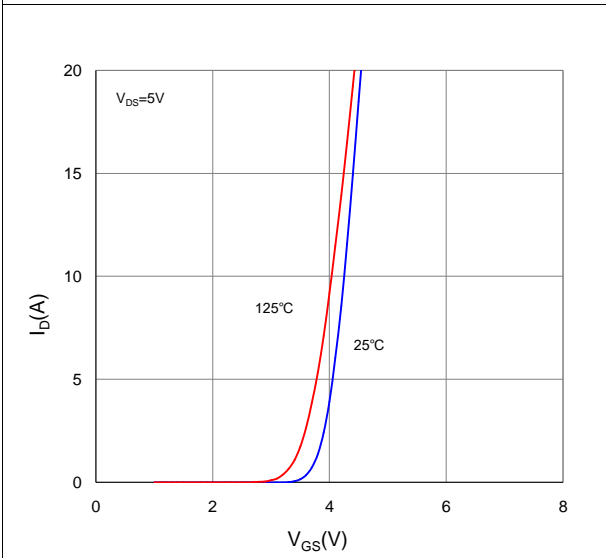


Figure 6. Typical Source-Drain Diode Forward Voltage

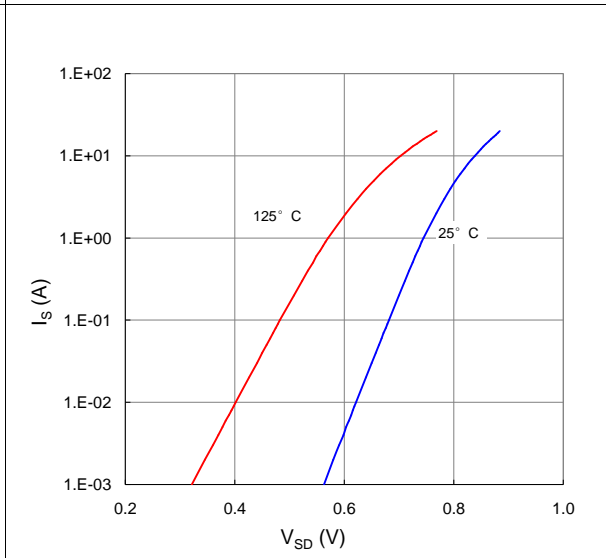


Figure 7. Typical Gate-Charge vs. Gate-to-Source Voltage

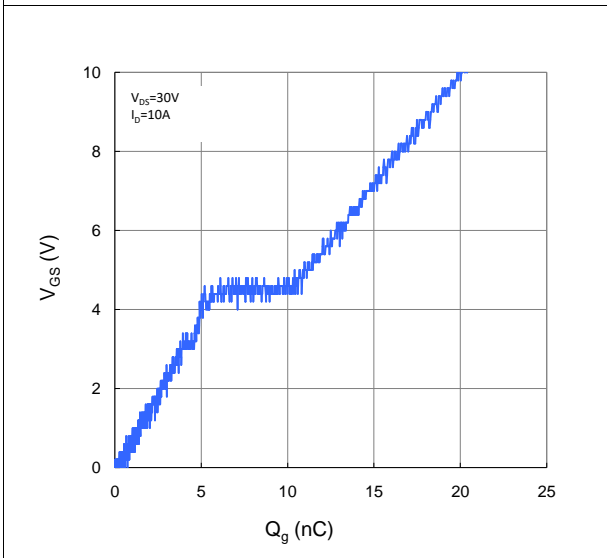


Figure 8. Typical Capacitance vs. Drain-to-Source Voltage

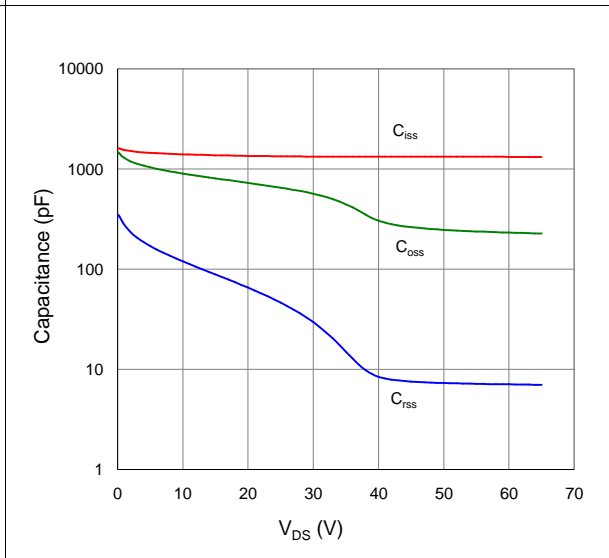


Figure 9. Maximum Safe Operating Area

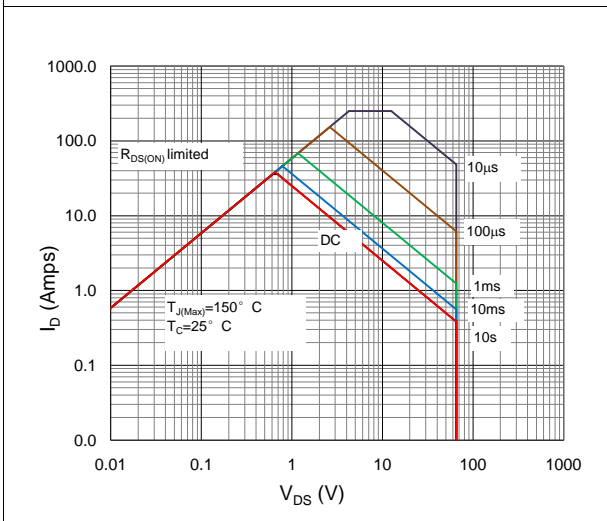


Figure 10. Maximum Drain Current vs. Case Temperature

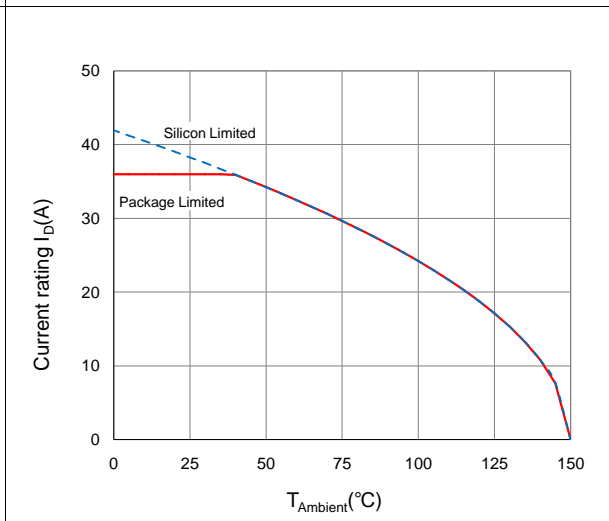
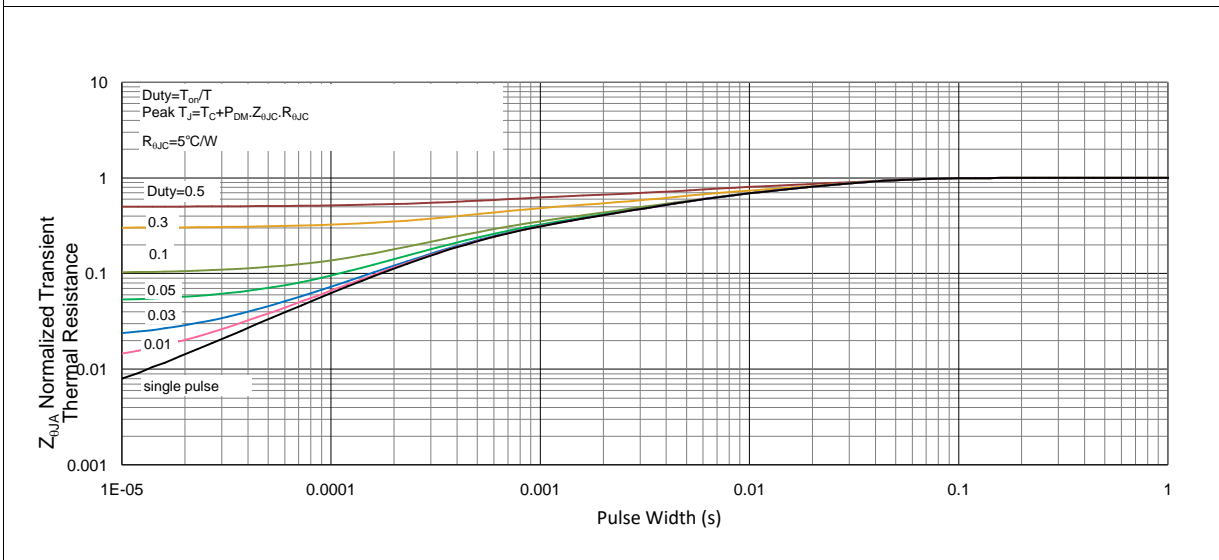
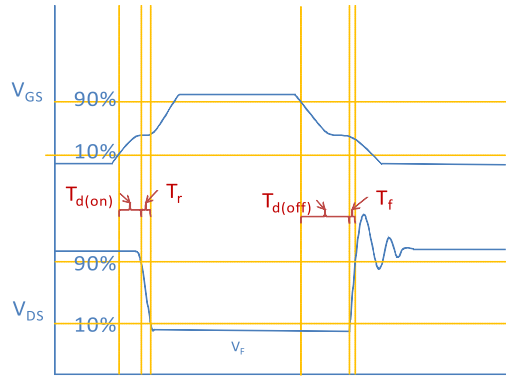
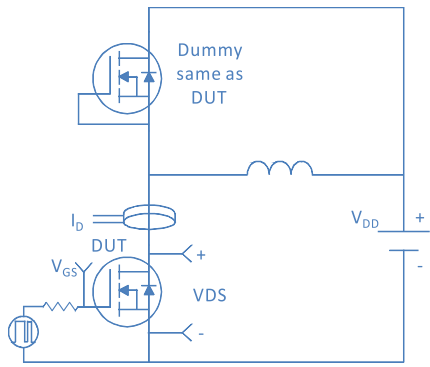


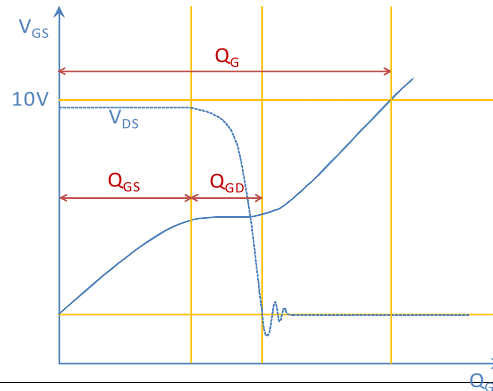
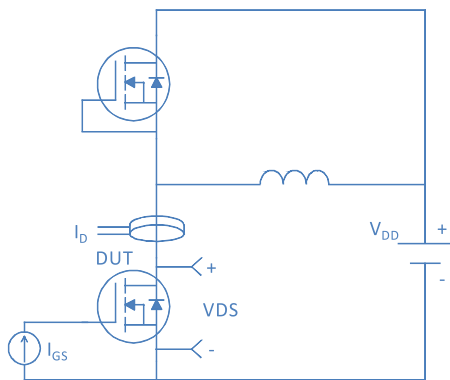
Figure 11. Normalized Maximum Transient Thermal Impedance, Junction-to-Ambient



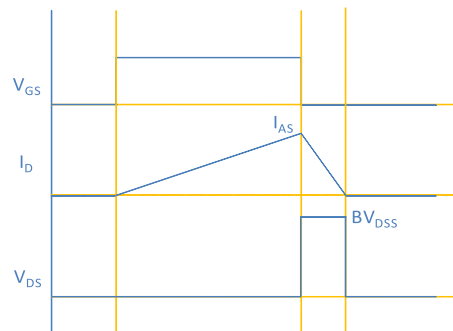
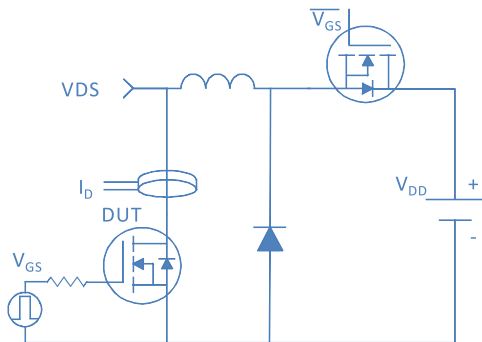
Inductive switching Test



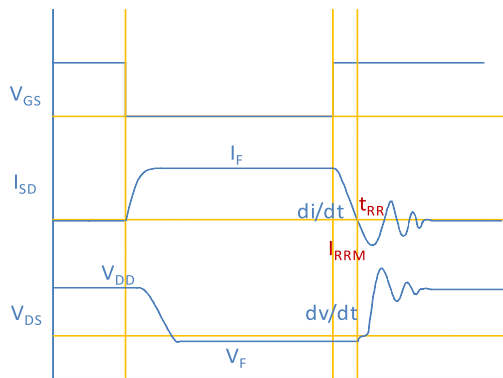
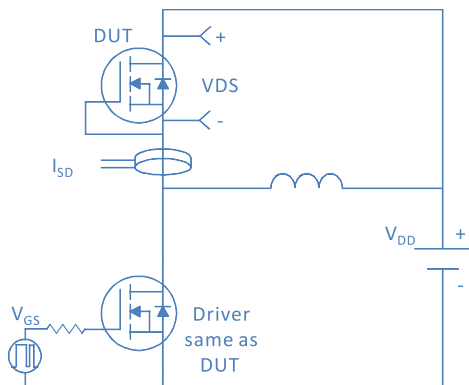
Gate Charge Test



Uclamped Inductive Switching (UIS) Test

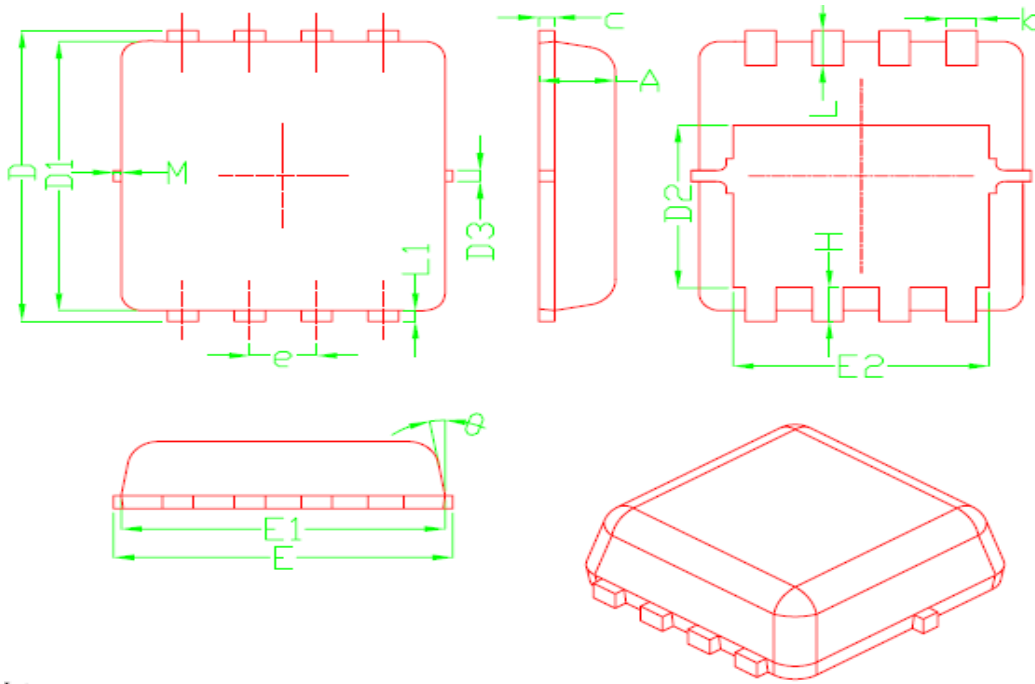


Diode Recovery Test



Package Outline

DFN3.3\*3.3\_P, 8 Leads



SYMBOL	DIMENSIONAL REQOMTS		
	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
D3	---	0.13	---
E	3.20	3.30	3.40
E1	3.00	3.15	3.20
E2	2.39	2.49	2.59
e	0.65BSC		
H	0.30	0.39	0.50
L	0.30	0.40	0.50
L1	---	0.13	---
θ	---	10°	12°
M	*	*	0.15
* Not specified			