

Product Summary

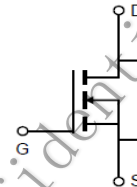
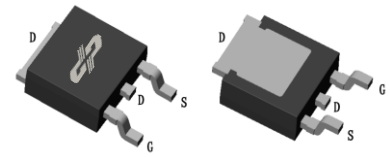
Part #	V_{DS}	$R_{DS(on).typ}$ (@ $V_{GS}=10V$)	$R_{DS(on).typ}$ (@ $V_{GS}=4.5V$)	I_D
DP110N06DGL	60V	8mΩ	10.3mΩ	56A

Features

- Uses advanced Trench MOSFET-DPMOS technology
- Extremely low $R_{DS(on)}$ /High Speed Power Switching
- Excellent $Q_g \times R_{DS(on)}$ product(FOM)
- Qualified according to JEDEC criteria

Applications

- Motor control and drive
- Power Management Switches
- High-frequency switching and synchronous rectification


100% Avalanche Tested
100% Rg Tested
Package Marking and Ordering Information

Part #	Marking	Package	Packing
DP110N06DGL	110N06DG	TO-252	Reel


Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Drain-source voltage	V_{DS}	60	V
Continuous drain current $T_C = 25^\circ C$ $T_C = 100^\circ C$	I_D	56 36	A
Pulsed drain current ($T_C = 25^\circ C$, t_p limited by T_{jmax})	$I_{D \text{ pulse}}$	224	A
Avalanche energy, single pulse ($I=0.3mA$, $R_g=25$) ^[1]	E_{AS}	60	mJ
Gate-Source voltage	V_{GS}	±20	V
Power dissipation ($T_C = 25^\circ C$)	P_{tot}	52	W
Operating junction and storage temperature	T_j, T_{stg}	-55...+150	°C

[1].EAS is tested at starting $T_j = 25^\circ C$, $V_{GS} = 10V$.

Thermal Resistance

Parameter	Symbol	Max	Unit
Thermal resistance, junction – case.	R_{thJC}	2.4	°C/W
Thermal resistance, junction – ambient(min. footprint)	R_{thJA}	54	

Electrical Characteristic (at T_j = 25 °C, unless otherwise specified)

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		
Static Characteristic						
Drain-source breakdown voltage	BV_{DSS}	60	-	-	V	$V_{GS}=0V, I_D=250\mu A$
Gate threshold voltage	$V_{GS(th)}$	1	-	2.5	V	$V_{DS}=V_{GS}, I_D=250\mu A$
Zero gate voltage drain current	I_{DSS}	-	-	1	μA	$V_{DS}=60V, V_{GS}=0V$ $T_j=25^{\circ}C$ $T_j=150^{\circ}C$
Gate-source leakage current	I_{GSS}	-	-	± 100	nA	$V_{GS}=\pm 20V, V_{DS}=0V$
Drain-source on-state resistance	$R_{DS(on)}$	-	8.0	10.0	m Ω	$V_{GS}=10V, I_D=25A$
		-	10.3	13.9	m Ω	$V_{GS}=4.5V, I_D=10A$
Gate resistance	R_g	-	1.2	1.8	Ω	$V_{GS}=0V, V_{DS}=0V,$ $f=1MHz$

Dynamic Characteristic^[2]

Input Capacitance	C _{iss}	-	1210	-	pF	V _{GS} =0V, V _{DS} =30V, f=1MHz
Output Capacitance	C _{oss}	-	300	-		
Reverse Transfer Capacitance	C _{rss}	-	5	-		
Gate Total Charge@V _{GS} =10V	Q _g	-	19	-	nC	V _{GS} =10V, V _{DS} =30V, I _D =25A, f=1MHz
Gate Total Charge@V _{GS} =4.5V	Q _g	-	10	-		
Gate-Source charge	Q _{gs}	-	3.6	-		
Gate-Drain charge	Q _{gd}	-	3.4	-		
Turn-on delay time	t _{d(on)}	-	24	-	ns	V _{GS} =10V, V _{DD} =30V, R _{G_ext} =2.7Ω
Rise time	t _r	-	5.2	-		
Turn-off delay time	t _{d(off)}	-	32	-		
Fall time	t _f	-	7.7	-		

Body Diode Characteristic

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		
Body Diode Forward Voltage	V_{SD}	-	0.88	1.2	V	$V_{GS}=0V, I_{SD}=25A$
Diode continuous forward current	I_S	-	56	-	A	TC = 25°C
Diode pluse current	$I_{S\ pluse}$	-	224	-	A	TC = 25°C
Body Diode Reverse Recovery Time ^[2]	t_{rr}	-	32	-	ns	$I_F=25A, dI/dt=100A/\mu s$
Body Diode Reverse Recovery Charge ^[2]	Q_{rr}	-	36	-	nC	

[2]. Defined by design. Not subject to production test

Typical Performance Characteristics

Fig 1: Output Characteristics

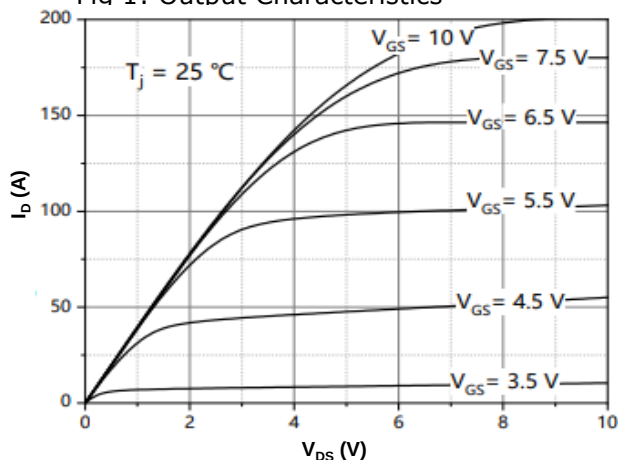


Fig 2: Transfer Characteristics

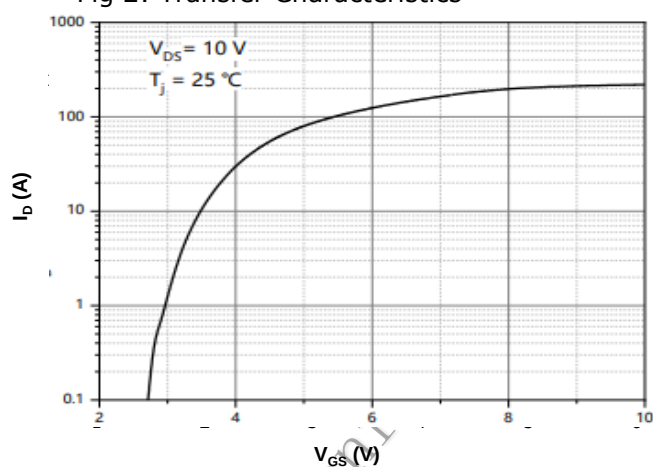


Fig 3: $R_{DS(on)}$ vs Drain Current and Gate Voltage

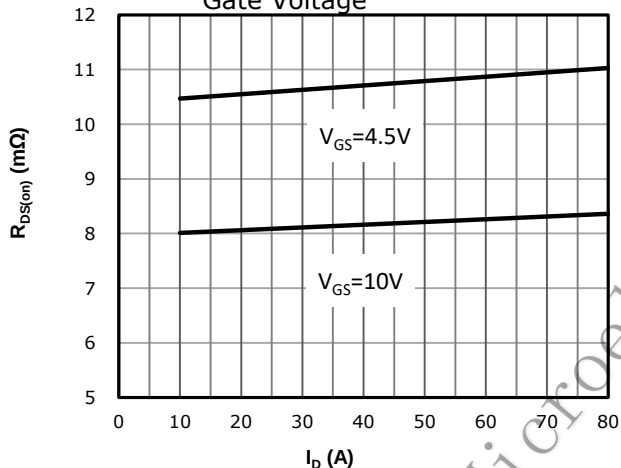


Fig 4: $R_{DS(on)}$ vs Gate Voltage

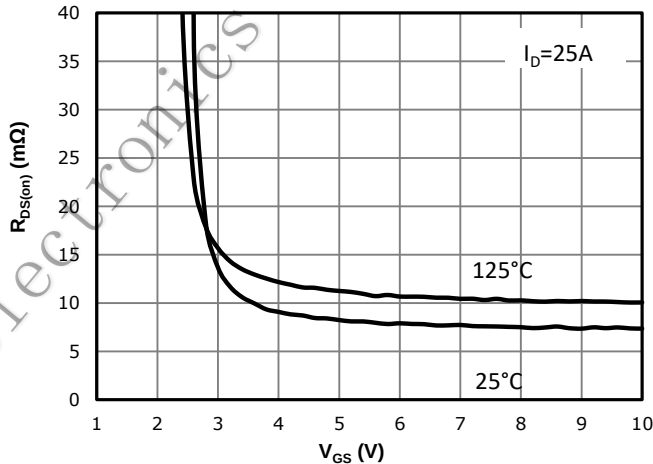


Fig 5: $R_{DS(on)}$ vs. Temperature

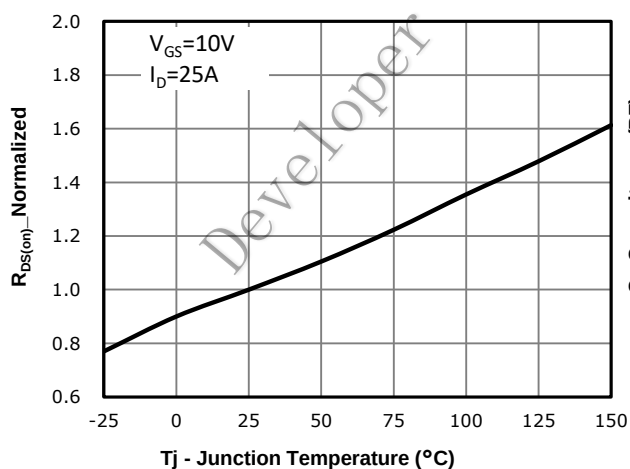


Fig 6: Capacitance Characteristics

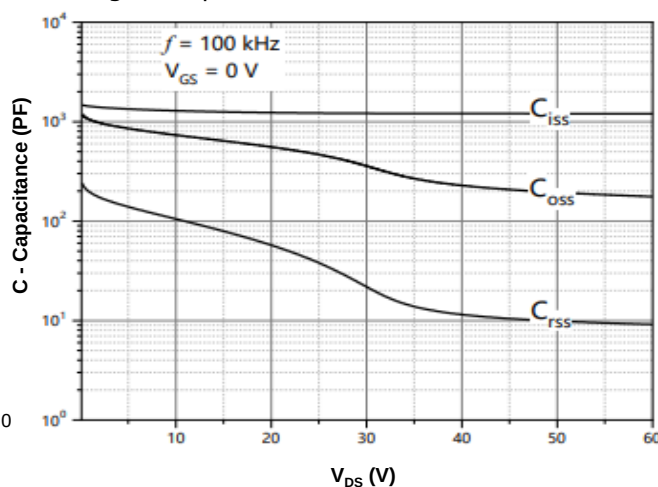


Fig 7: Gate Charge Characteristics

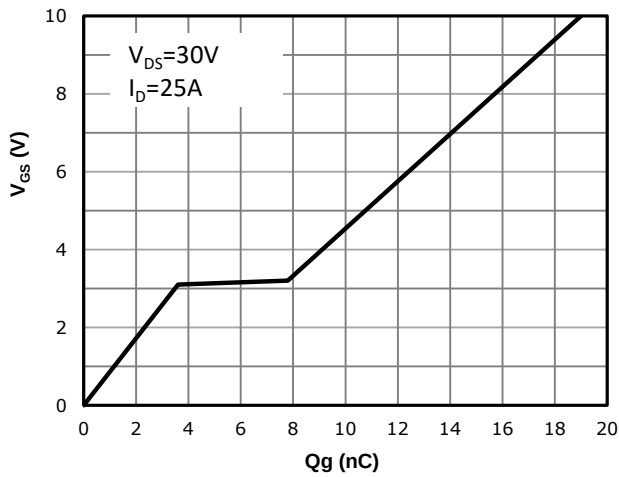


Fig 8: Body-diode Forward Characteristics

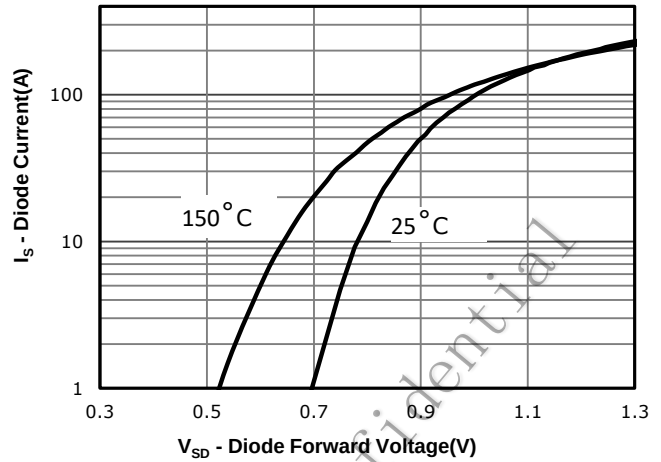


Fig 9: Power Dissipation

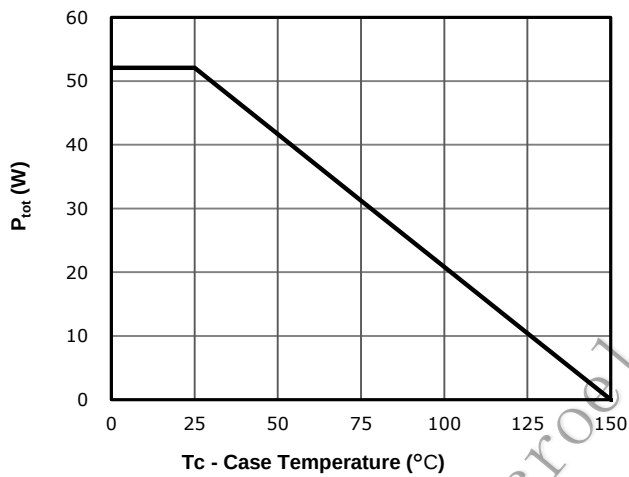


Fig 10: Drain Current Derating

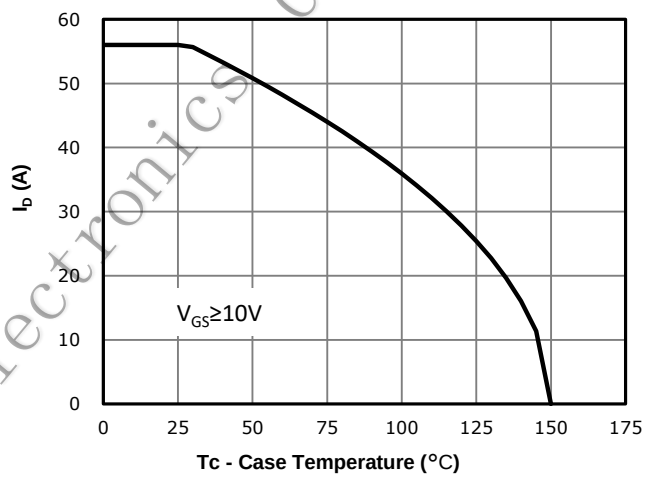


Fig 11: Safe Operating Area

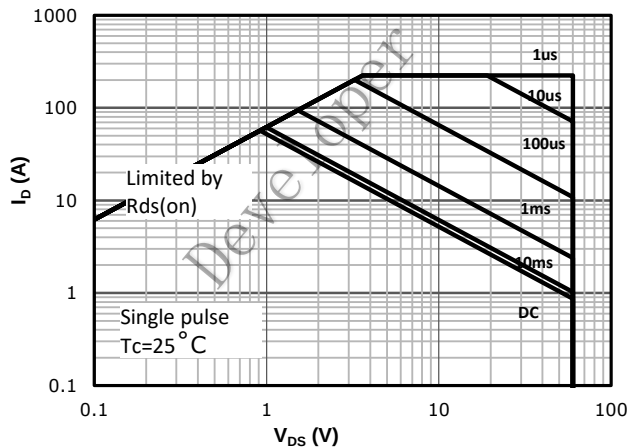
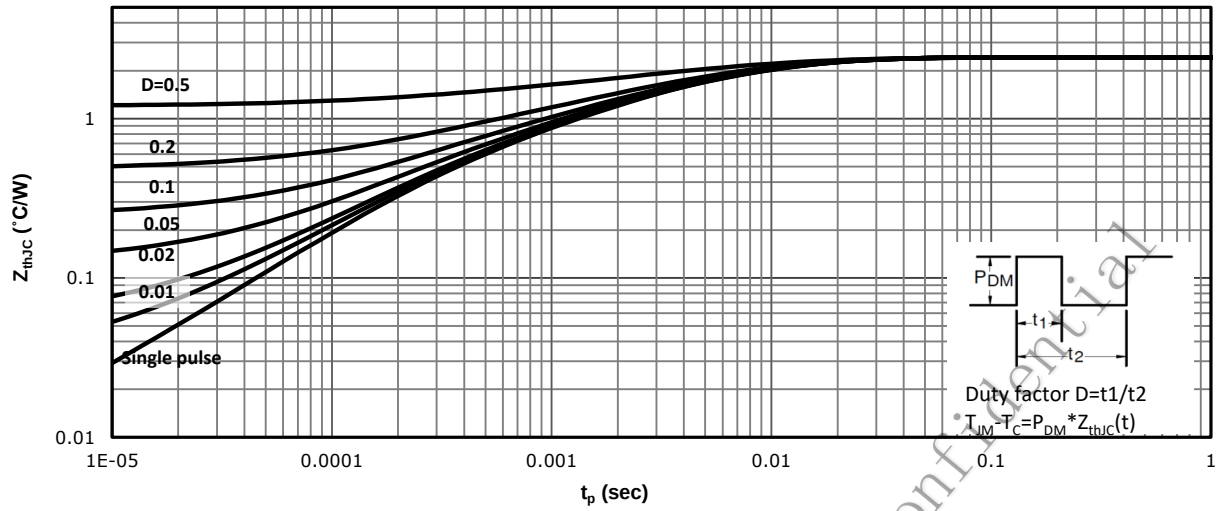
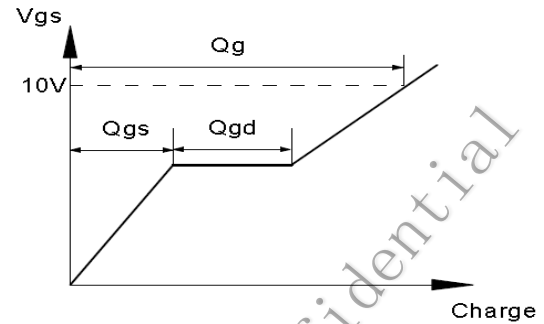
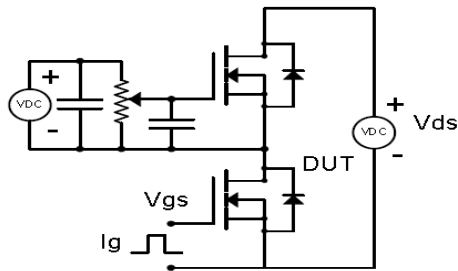


Fig 12: Max. Transient Thermal Impedance

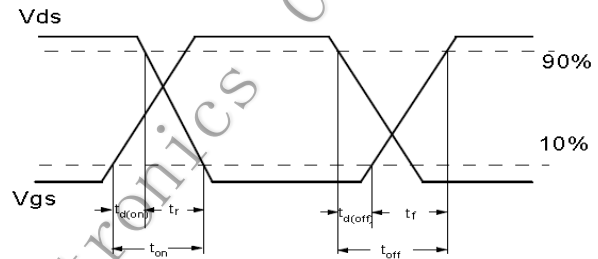
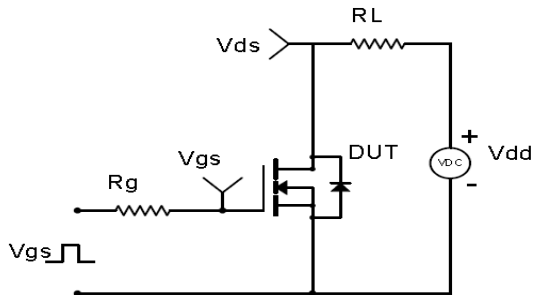


Test Circuit & Waveform

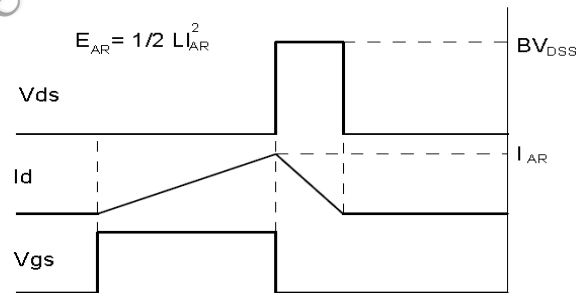
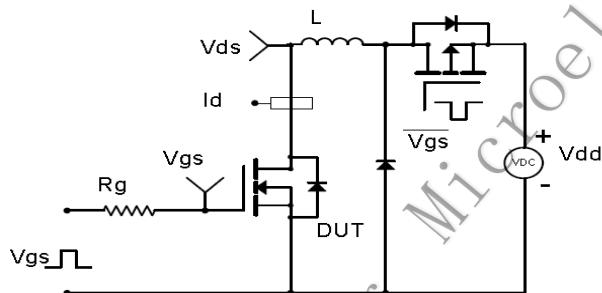
Gate Charge Test Circuit & Waveform



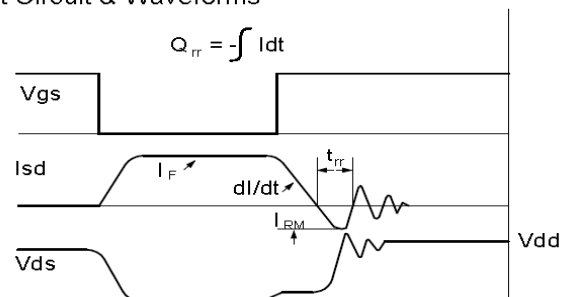
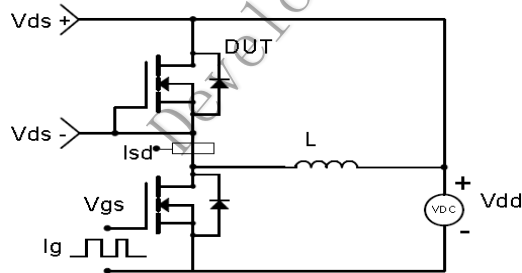
Resistive Switching Test Circuit & Waveforms



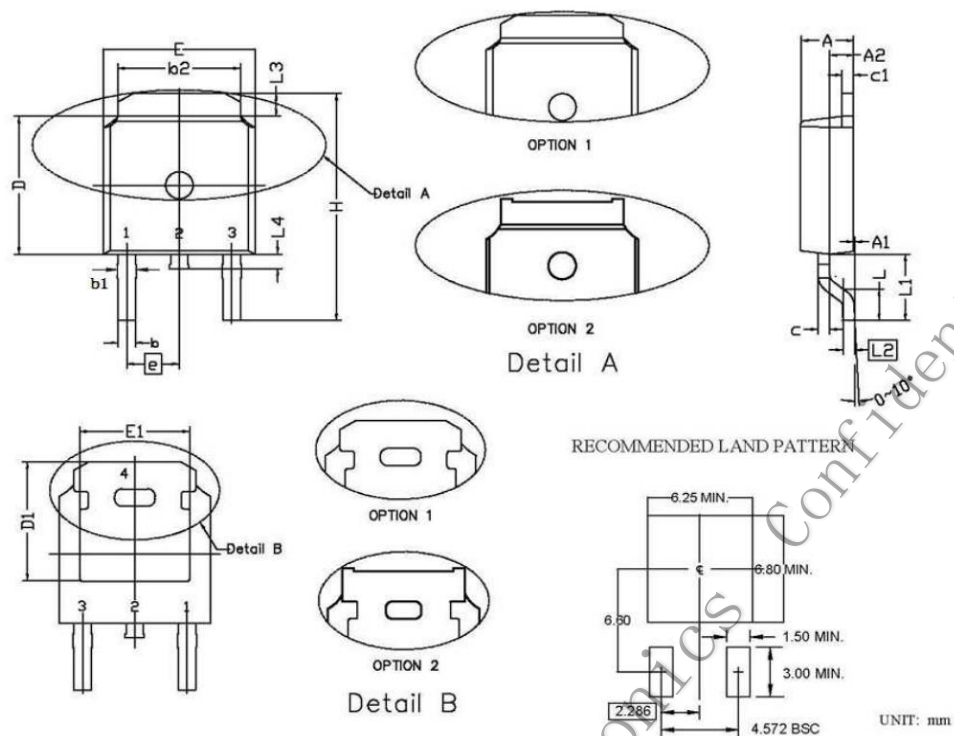
Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



Package Outline: TO-252



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.15	2.45	0.085	0.096
A1	0.00	0.15	0.000	0.006
A2	0.76	1.36	0.030	0.054
b	0.60	0.91	0.024	0.036
b1	0.65	1.15	0.026	0.045
b2	5.00	5.64	0.197	0.222
c	0.45	0.61	0.018	0.024
c1	0.36	0.66	0.014	0.026
D	5.80	6.30	0.228	0.248
D1	5.00	6.00	0.197	0.236
e	2.29 BSC.		0.090 BSC.	
E	6.30	6.90	0.248	0.272
E1	4.55	5.30	0.179	0.209
H	9.40	10.48	0.370	0.413
L	1.18	1.70	0.046	0.067
L1	2.92 REF		0.115 REF	
L2	0.36	0.66	0.014	0.026
L3	0.72	1.35	0.028	0.053
L4	0.60	1.20	0.024	0.047

Revision History

Revision	Major changes
1.0	Release for formal version

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