

Product Summary

Part #	V_{DS}	$R_{DS(on).typ}$	I_D
DP65R950DJ	650V	0.84Ω	6A

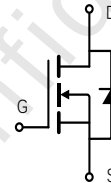
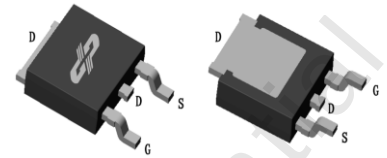
Features

- Super_Junction technology
- Low conduction resistance, superior switching performance
- High avalanche energy
- Better efficiency due to very low FOM

Applications

- Power factor correction
- Charger
- LED Lighting

TO-252



100% Avalanche Tested

100% Rg Tested

Package Marking and Ordering Information

Part #	Marking	Package	Packing
DP65R950DJ	65R950DJ	TO-252	Tape/Reel


Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Drain-source voltage	V_{DS}	650	V
Continuous drain current $T_C = 25^\circ\text{C}$ $T_C = 100^\circ\text{C}$	I_D	6 3.9	A
Pulsed drain current ($T_C = 25^\circ\text{C}$, t_p limited by T_{jmax})	$I_{D \text{ pulse}}$	18	A
Avalanche energy, single pulse ($L=30\text{mH}$, $R_g=25$) ^[1]	E_{AS}	60	mJ
Peak diode recovery dv/dt ^[2]	dv/dt	50	V/ns
Gate-Source voltage	V_{GS}	±30	V
Power dissipation ($T_C = 25^\circ\text{C}$)	P_{tot}	63	W
Operating junction and storage temperature	T_j, T_{stg}	-55...+150	°C

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

[2]. Identical low side and high side switch with identical R_g

Parameter	Symbol	Max	Unit
Thermal resistance, junction – case.	R_{thJC}	2	°C/W
Thermal resistance, junction – ambient(min. footprint)	R_{thJA}	55	

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

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		

Static Characteristic

Drain-source breakdown voltage	BV_{DSS}	650	-	-	V	$V_{GS}=0V, I_D=250\mu A$
Gate threshold voltage	$V_{GS(th)}$	3	3.7	4.5	V	$V_{DS}=V_{GS}, I_D=250\mu A$
Zero gate voltage drain current	I_{DSS}	-	-	1	μA	$V_{DS}=650V, V_{GS}=0V$ $T_j=25^\circ\text{C}$
		-	-	100		$T_j=125^\circ\text{C}(V_{DS}=520V)$
Gate-source leakage current	I_{GSS}	-	-	± 100	nA	$V_{GS}=\pm 30V, V_{DS}=0V$
Drain-source on-state resistance	$R_{DS(on)}$	-	0.84	0.95	Ω	$T_j=25^\circ\text{C}$ $V_{GS}=10V, I_D=2A$
Gate resistance	R_g	-	8	-	Ω	$V_{GS}=0V, V_{DS}=0V$, $f=1\text{MHz}$
Transconductance ^[2]	g_{fs}	-	4	-	S	$V_{DS}=20V, I_D=2A$

Dynamic Characteristic^[3]

Input Capacitance	C_{iss}	-	240	-	pF	$V_{GS}=0V, V_{DS}=100V$, $f=1\text{MHz}$
Output Capacitance	C_{oss}	-	15	-		
Reverse Transfer Capacitance	C_{rss}	-	0.9	-		
Gate Total Charge($V_{GS}=10V$)	Q_g	-	10	-	nC	$V_{GS}=10V, V_{DS}=520V$, $I_D=2A, f=1\text{MHz}$
Gate-Source charge	Q_{gs}	-	2	-		
Gate-Drain charge	Q_{gd}	-	5	-		
Turn-on delay time	$t_{d(on)}$	-	31	-	ns	$V_{GS}=15V, V_{DD}=400V$, $R_{G_ext}=10\Omega$
Rise time	t_r	-	16	-		
Turn-off delay time	$t_{d(off)}$	-	33	-		
Fall time	t_f	-	38	-		

Body Diode Characteristic

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		
Body Diode Forward Voltage	V_{SD}	-	0.8	1	V	$V_{GS}=0V, I_{SD}=2A$
Diode continuous forward current	I_s	-	-	6	A	$TC = 25^{\circ}C$
Diode pluse current	$I_{s\ pluse}$	-	-	18	A	$TC = 25^{\circ}C$
Body Diode Reverse Recovery Time ^[3]	t_{rr}	-	198	-	ns	$I_F=2A, di/dt=100A/\mu s$
Body Diode Reverse Recovery Charge ^[3]	Q_{rr}	-	0.88	-	uC	

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

Typical Performance Characteristics

Fig 1: Output Characteristics

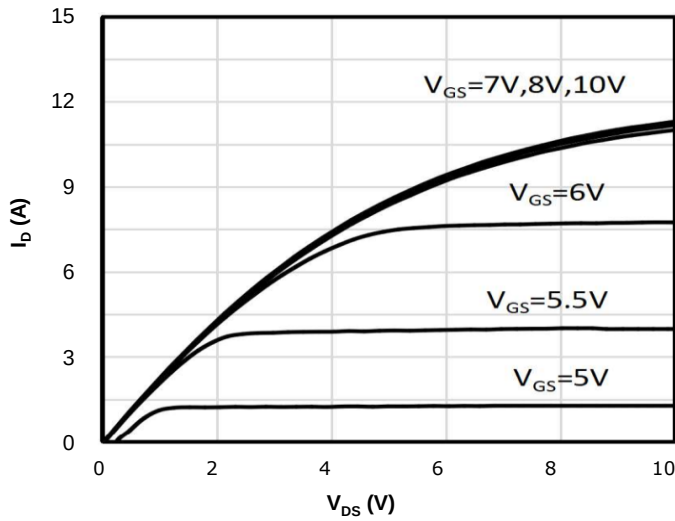


Fig 2: Transfer Characteristics

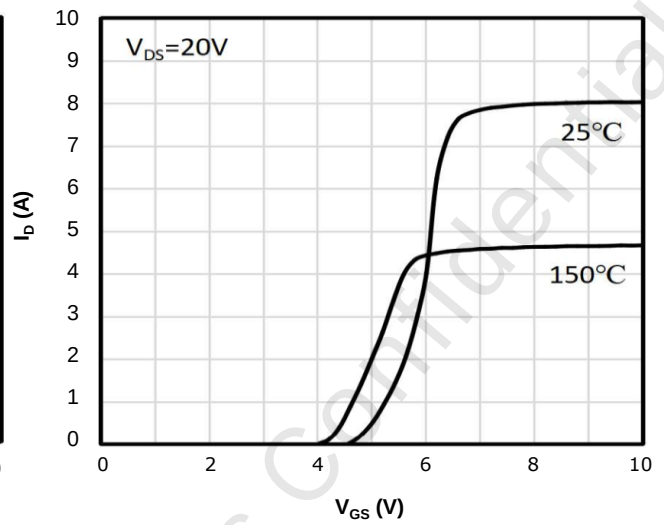


Fig 3: $R_{DS(on)}$ vs Drain Current and Gate Voltage

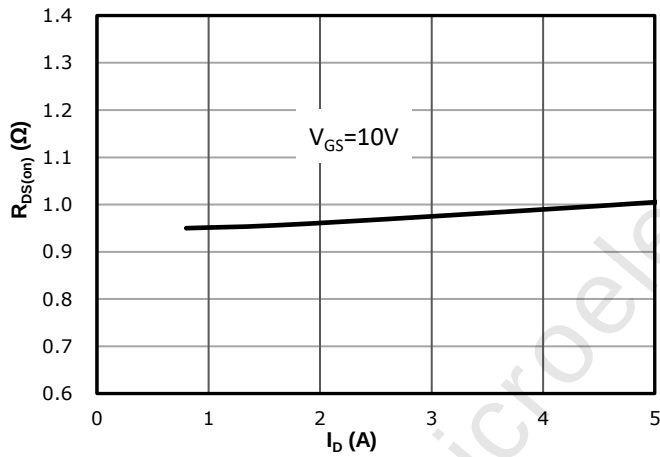


Fig 4: Break Down vs. Junction Temperature

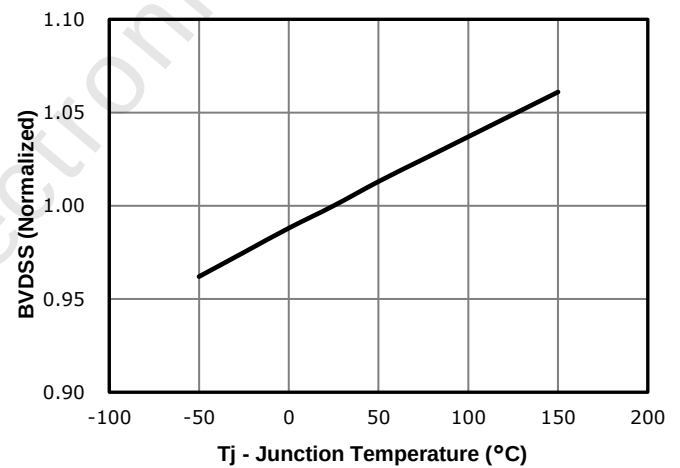


Fig 5: $R_{DS(on)}$ vs. Temperature

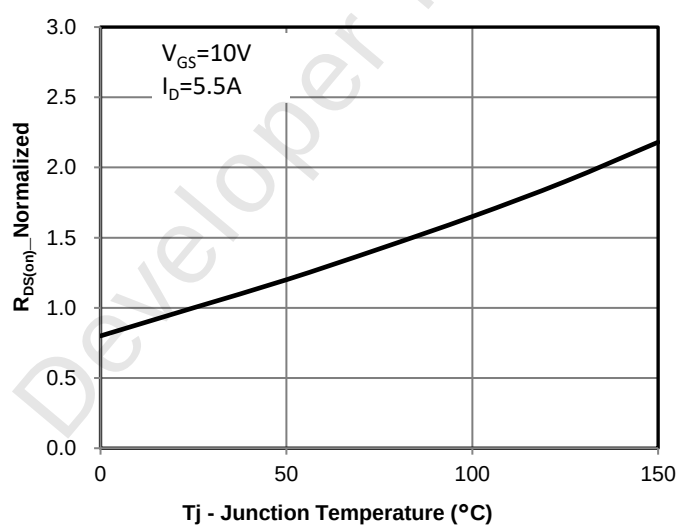


Fig 6: Capacitance Characteristics

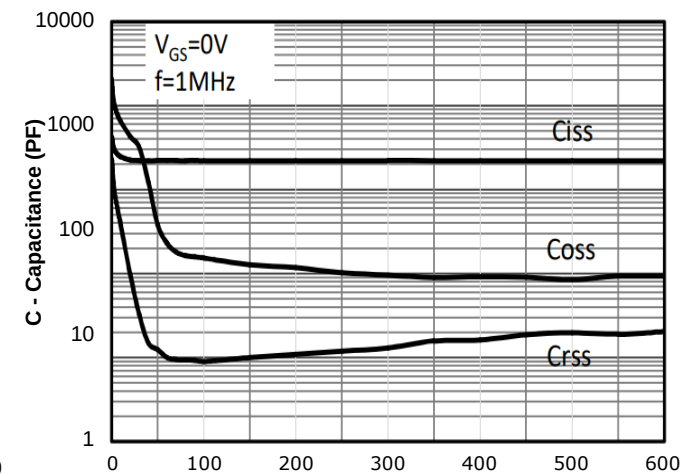


Fig 7: Gate Charge Characteristics

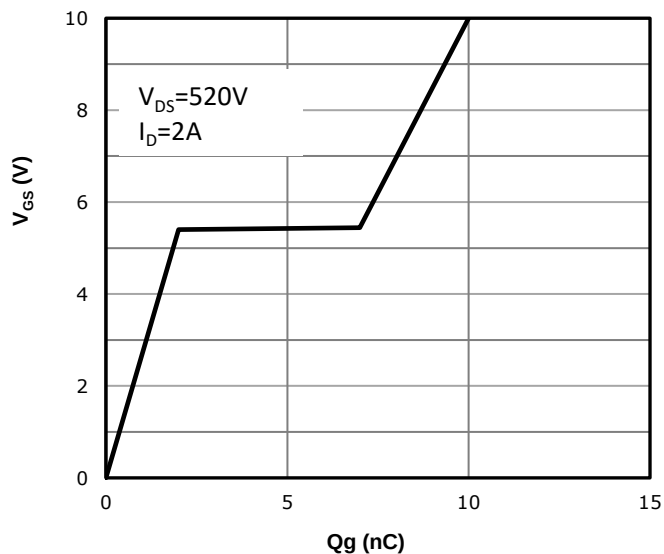


Fig 8: Body-diode Forward Characteristics

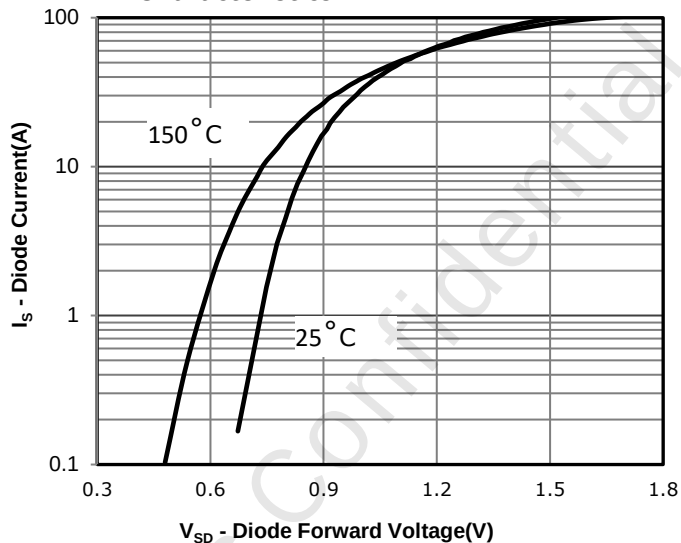


Fig 9: Rds(on) vs Gate Voltage

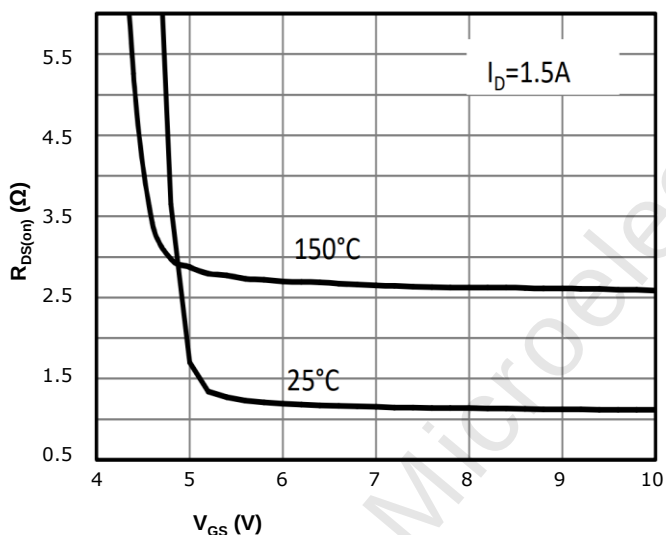


Fig 10: Drain Current Derating

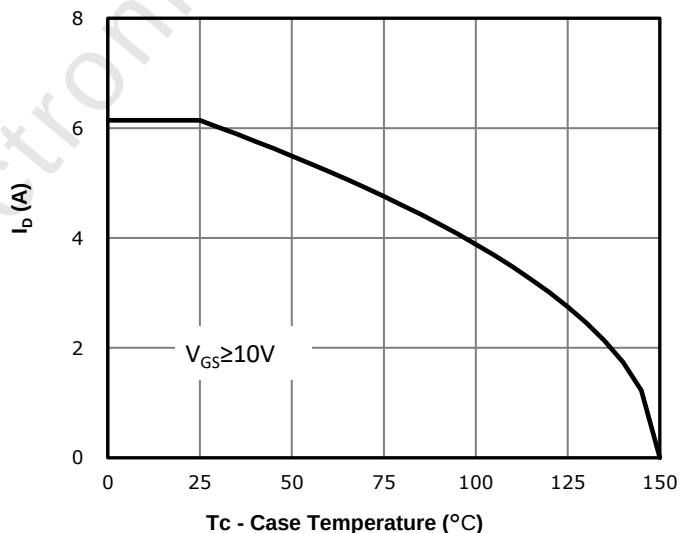


Fig 11: Safe Operating Area

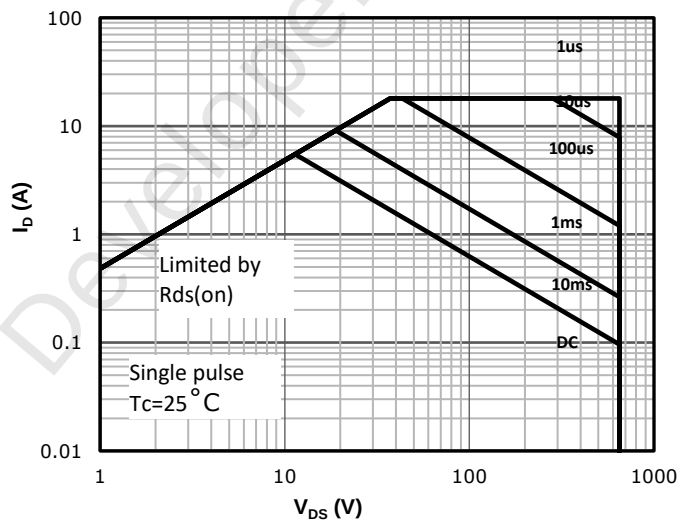
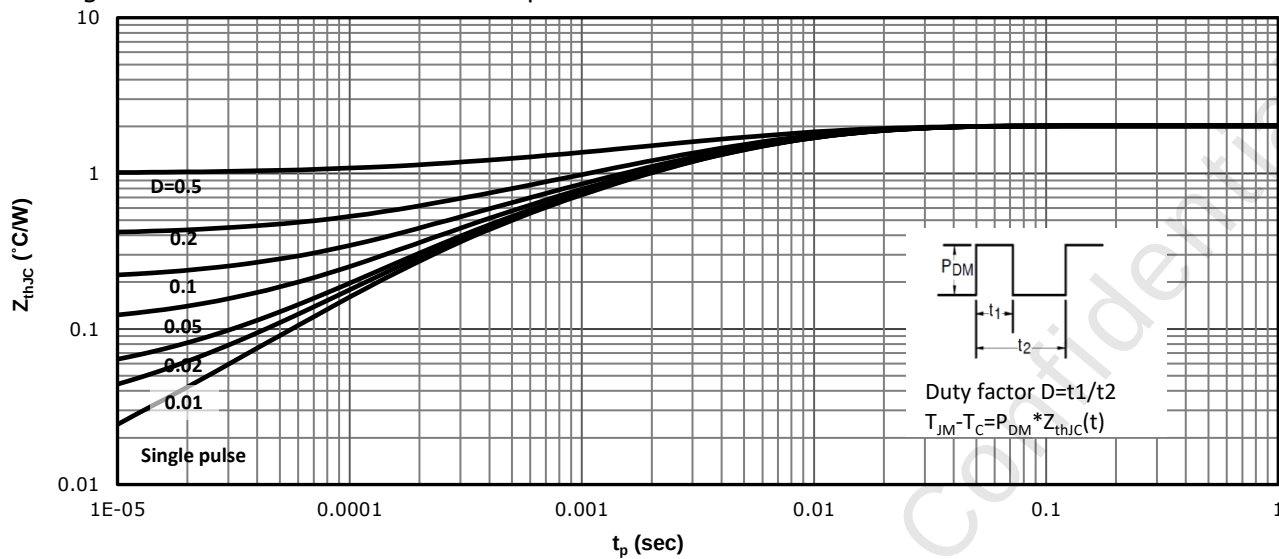
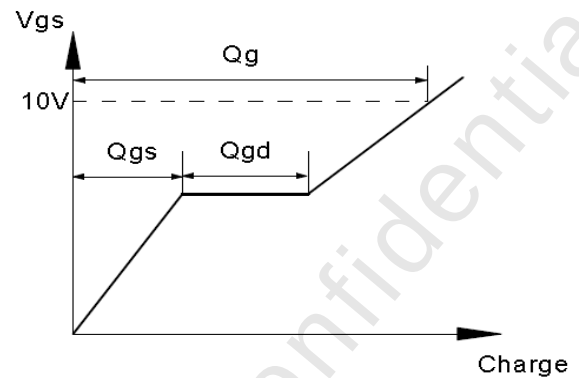
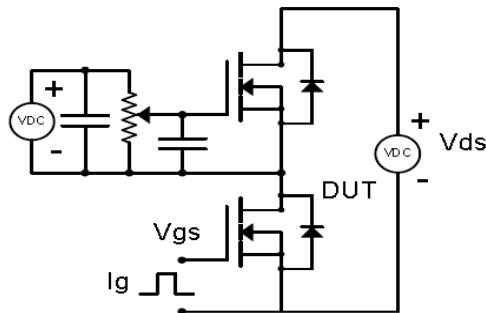


Fig 12: Max. Transient Thermal Impedance

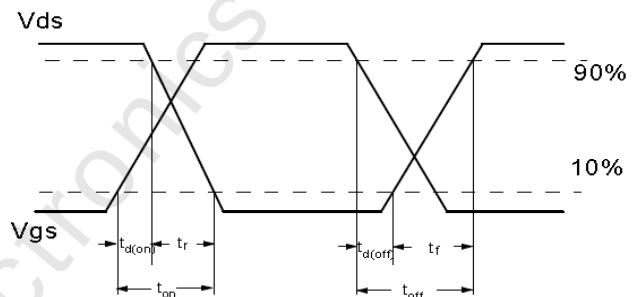
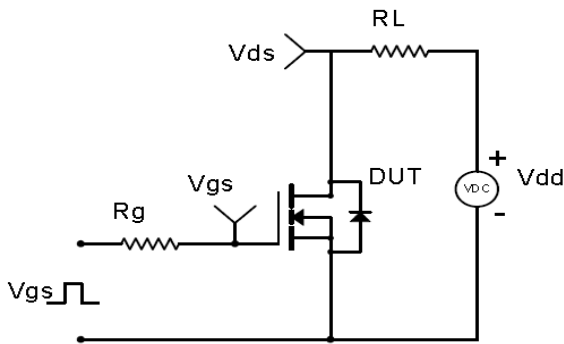


Test Circuit & Waveform

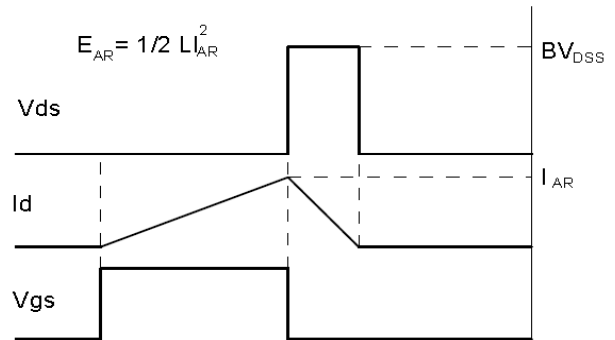
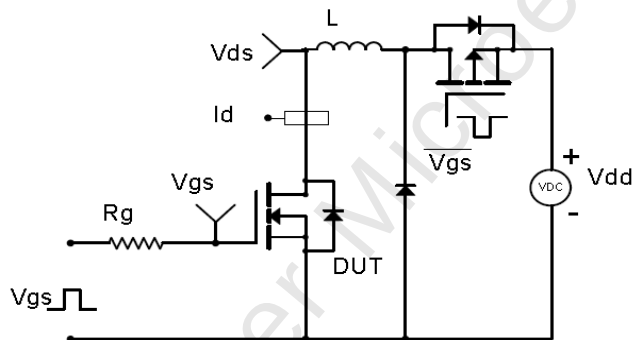
Gate Charge Test Circuit & Waveform



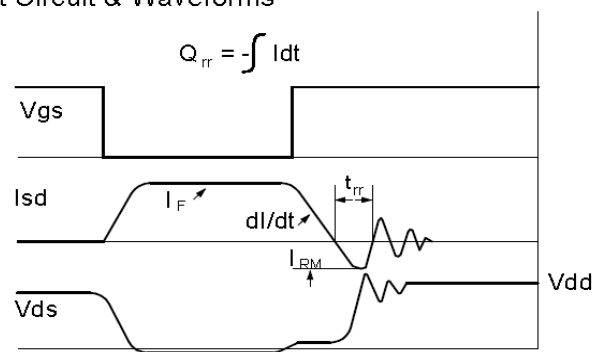
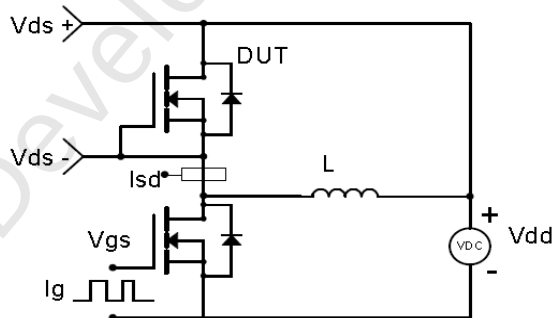
Resistive Switching Test Circuit & Waveforms

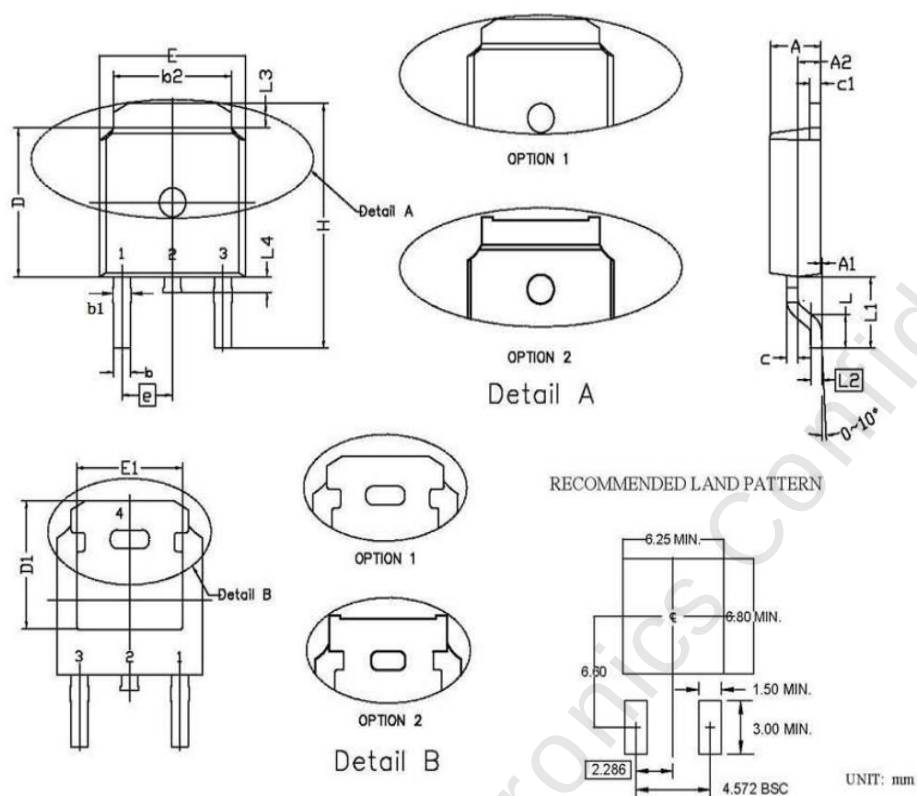


Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



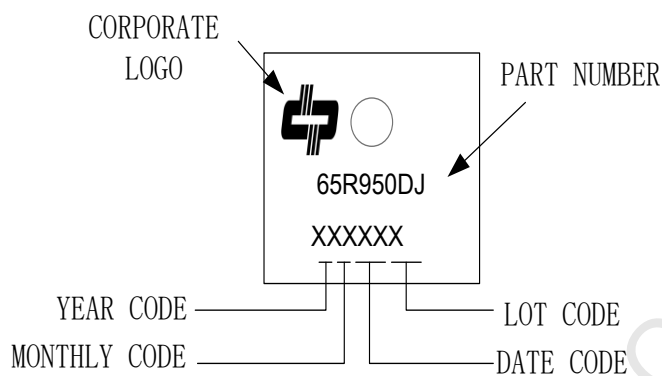
Diode Recovery Test Circuit & Waveforms



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

Part Marking Information



Revision History

Revision	Major changes
1.0	Release for formal version

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