SC260N65ZG

Silicon Carbide MOSFET 650V, 260mΩ, 11A

重庆平伟半导体股份有限公司

Features

- 0 V turn-off gate voltage can be applied
- High Blocking Voltage with Low RDS(on)
- High Speed Switching with Low Capacitances
- Easy to Parallel and Simple to Drive
- Qualified according to JEDEC criteria

100% DVDS Tested
100%
AvalancheTested

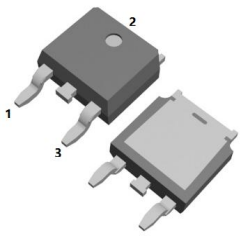
Applications

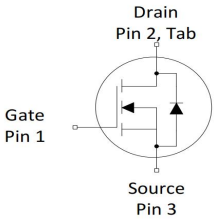
- Lighting
- Telecom and UPS
- PWM stages for e.g. PC Silverbox, Adapter, LCD & PDP TV

Product Summary

V_{DS}	650V
$R_{DS(on)\ typ.}$	260mΩ
I_D	11A

TO-252





Package Marking and Ordering Information

Part #	Marking	Package	Packing	Reel Size	Tape Width	Qty
SC260N65ZG	SC260N65ZG	TO-252	Tape&Reel	13 inches	16mm	2500

Absolute Maximum Ratings

Parameter	**Symbol**	**Value**	**Unit**
Drain-source voltage	V_{DS}	650	V
Continuous drain current T_C = 25°C T_C = 100°C (Silicon limit)	I_D	 11 8	A
Pulsed drain current (T_C = 25°C)	$I_{D\ pulse}$	34	A
Avalanche energy, single pulse (L=5mH)	E_{AS}	23	mJ
Gate-Source voltage,max.transient voltage	V_{GSmax}	-10/+22	V
Recommended operating values	V_{GSsop}	-5/+18	V
Power dissipation T_C = 25°C	P_{tot}	 29	W
Operating junction and storage temperature	T_j , T_{stg}	-55...+175	°C

Thermal Resistance

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		
Thermal resistance, junction – case.	R_{thJC}	-	3.5	5.2	°C/W	-
Thermal resistance, junction - ambient(min. footprint)	R_{thJA}	-	-	50	°C/W	1 inch²,2oz single copper FR-4 PCB.

Electrical Characteristic (at Tj = 25 °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=100uA
Gate threshold voltage	$V_{GS(th)}$	2.5	3.2	4.5	V	V_{DS}=V_{GS}, I_D=2.5mA
Zero gate voltage drain current	I_{DSS}	- -	1 -	10 100	μA	V_{DS}=650V,V_{GS}=0V T_j=25°C T_j=175°C
Gate-source leakage current	I_{GSS}	-	-	100	nA	V_{GS}=22V,V_{DS}=0V
		-	-	-100	nA	V_{GS}=-10V,V_{DS}=0V
Drain-source on-state resistance	$R_{DS(on)}$	-	260	330	mΩ	V_{GS}=15V,I_D=5A
Drain-source on-state resistance	$R_{DS(on)}$	-	210	260	mΩ	V_{GS}=18V,I_D=5A
Transconductance	g_{fs}	-	3.4	-	S	V_{DS}=20V,I_D=4A
Dynamic Characteristic						
Input Capacitance	C_{iss}	-	265	-	pF	V_{GS}=0V, V_{DS}=400V, f=1MHz
Output Capacitance	C_{oss}	-	22	-		
Reverse Transfer Capacitance	C_{rss}	-	3	-		
Gate Total Charge	Q_G	-	14	-	nC	V_{DS}=400V,I_D=5A ,V_{GS}=0V/18V
Gate-Source charge	Q_{gs}	-	3	-		
Gate-Drain charge	Q_{gd}	-	6	-		
Turn-on delay time	$t_{d(on)}$	-	25	-	ns	V_{GS}=0/18V, V_{DD}=200V, R_G=10Ω,I_D=5A
Rise time	t_r	-	5	-		
Turn-off delay time	$t_{d(off)}$	-	35	-		
Fall time	t_f	-	7	-		
Gate resistance	R_G	-	16.8	-	Ω	V_{GS}=0V, f=1MHz

Body Diode Characteristic

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		
Body Diode Forward Voltage	V_{SD}	- -	5.0 4.5	- -	V	V_{GS}=-5V, I_{SD}=5A T_j=25°C T_j=175°C
Body Diode Continuous Forward Current	I_S	-	-	10	A	T_C = 25°C
		-	-	6	A	T_C = 100°C
Body Diode Reverse Recovery Time	t_{rr}	-	71	-	ns	V_{GS}=-5V,I_{SD}=5A, V_R=200V di/dt=1000A/us
Body Diode Reverse Recovery Charge	Q_{rr}	-	40	-	nC	
Peak Reverse Recovery Current	I_{RRM}	-	1.2	-	A	

Typical Performance Characteristics

Fig 1: Output Characteristics Tj=25°C

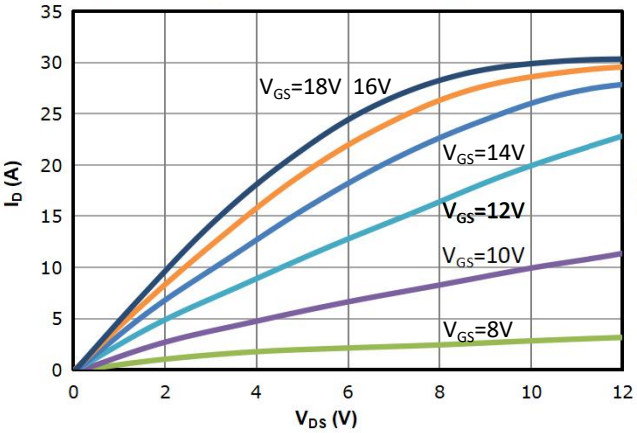


Fig 2: Output Characteristics Tj=175°C

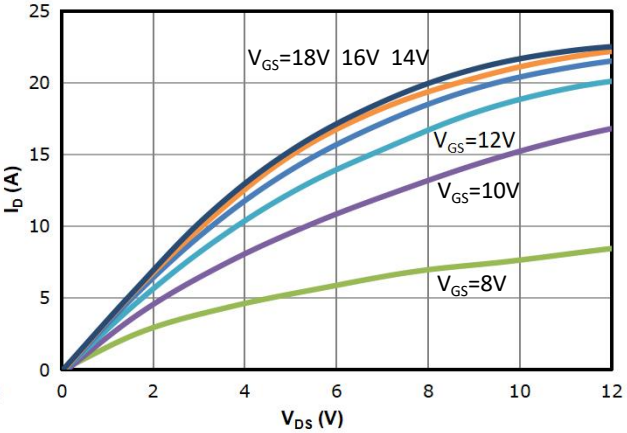


Fig 3: Transfer Characteristics

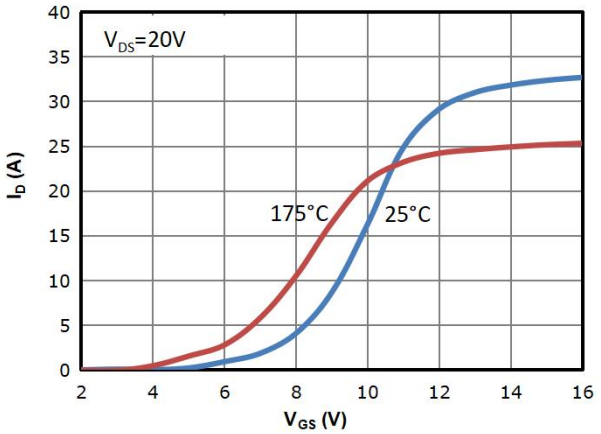


Fig 4: Rds(on) vs Drain Current and Gate Voltage

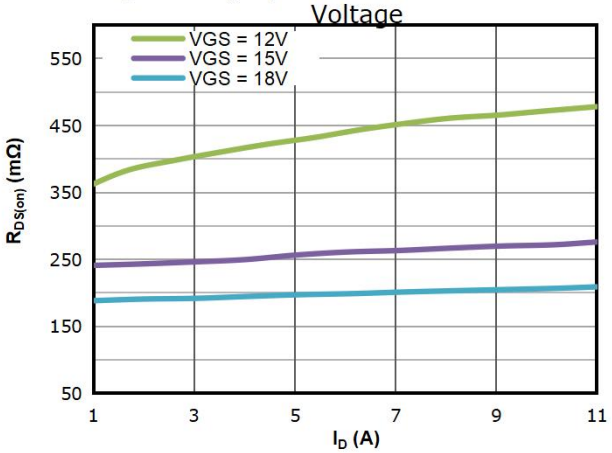


Fig 5: Rds(on) vs. Temperature

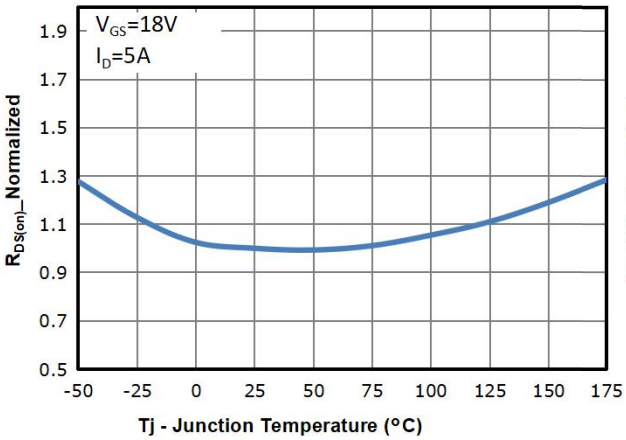


Fig 6: Vgs(th) vs. Temperature

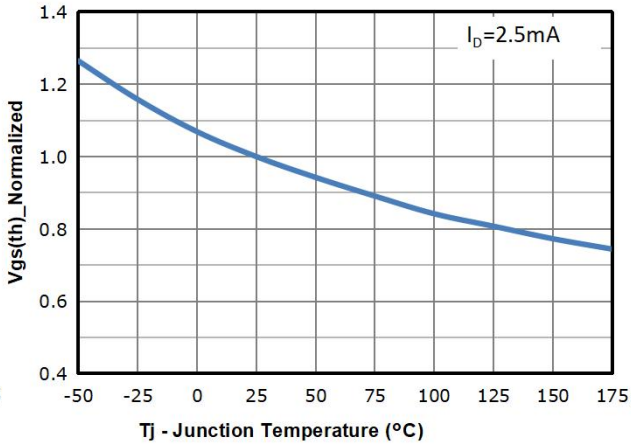


Fig 7: BVdss vs. Temperature

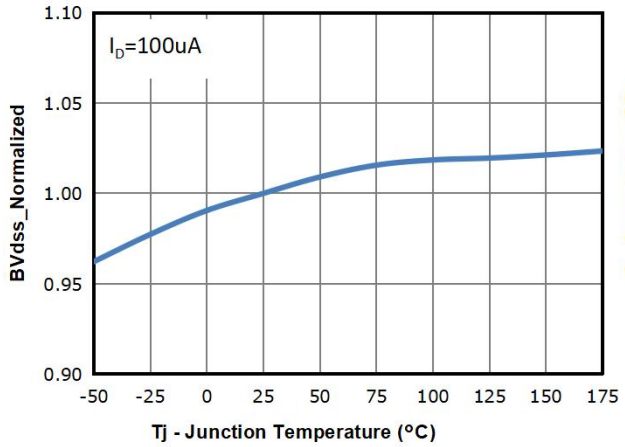


Fig 8: Capacitance Characteristics

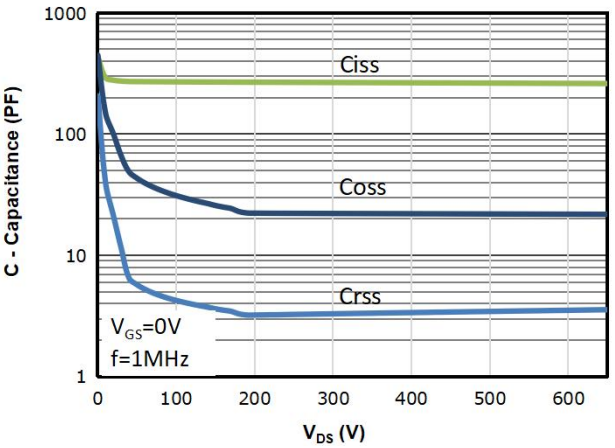


Fig 9: Gate ChargeCharacteristics

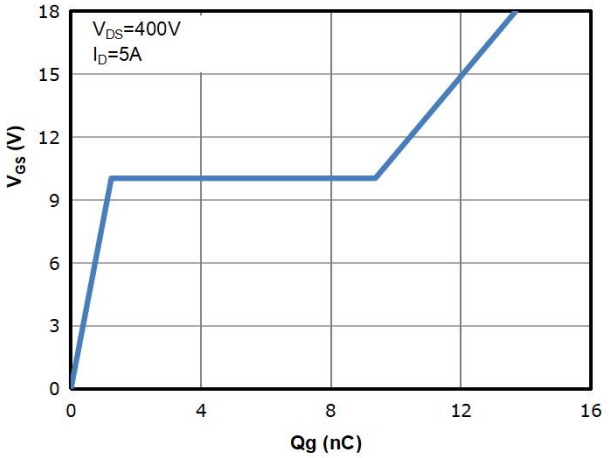


Fig 10: Body-diode Forward Characteristics

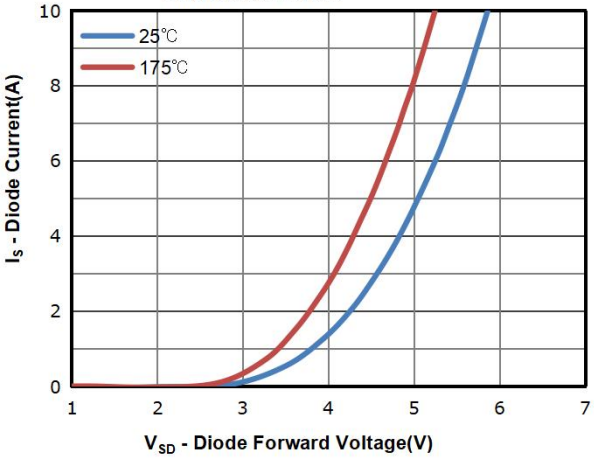


Fig 11: Power Dissipation

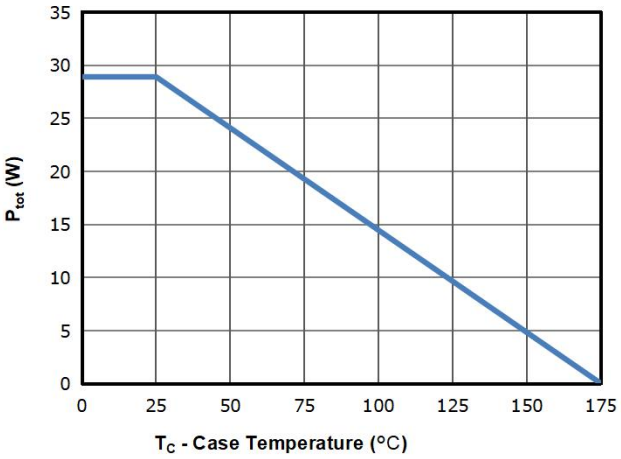


Fig 12: Drain Current Derating

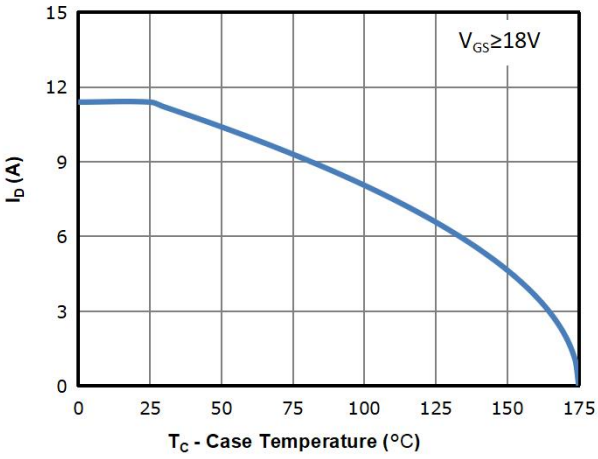


Fig 13: Safe Operating Area

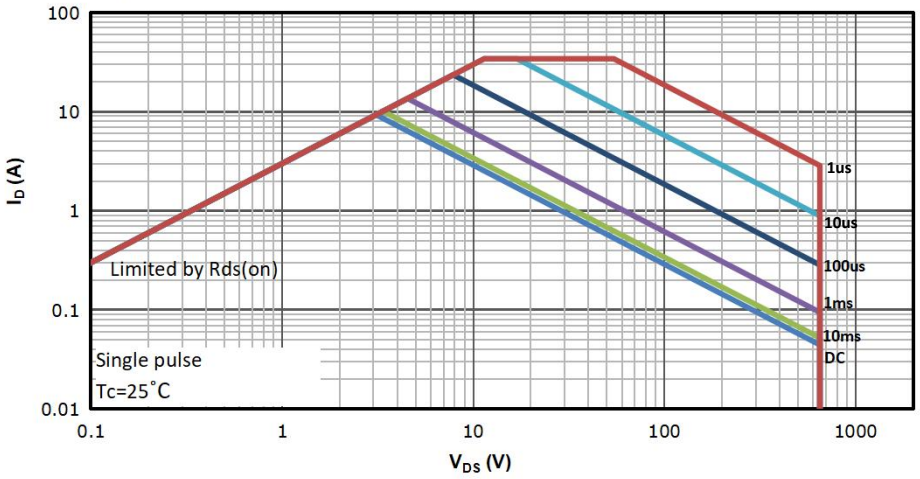
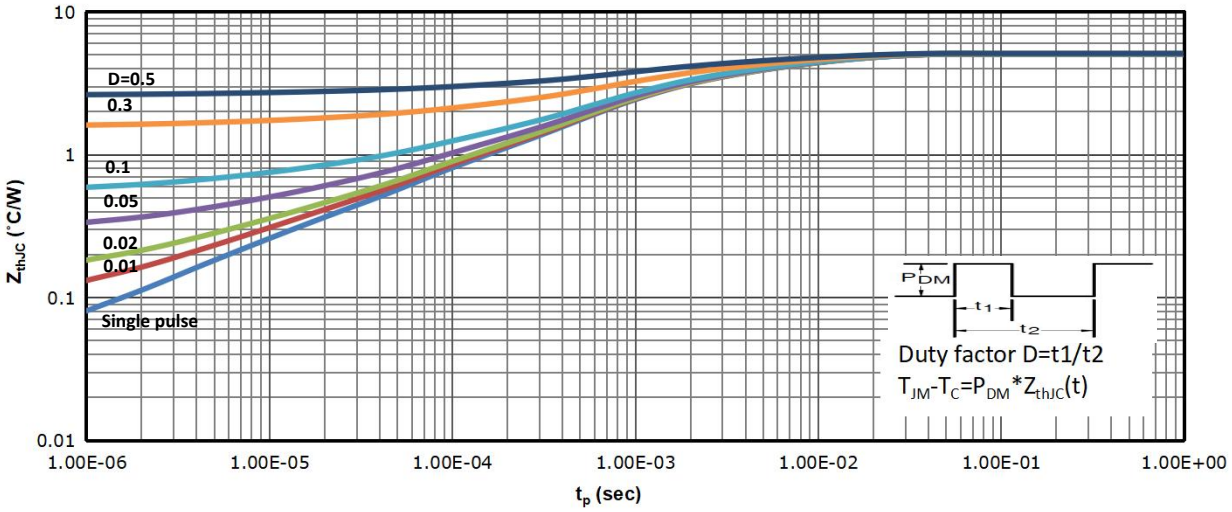
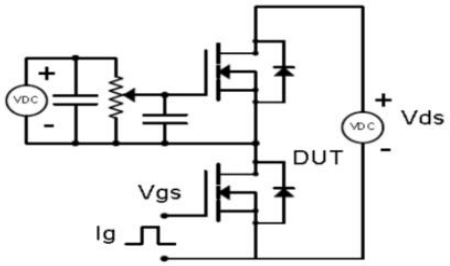


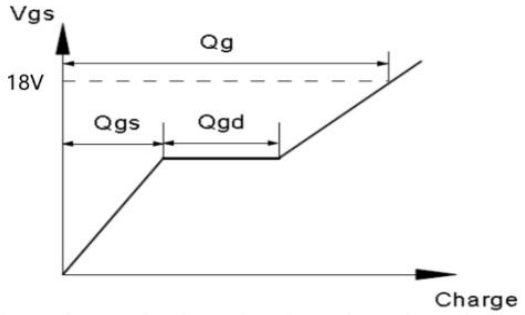
Fig 14: Max. Transient Thermal Impedance



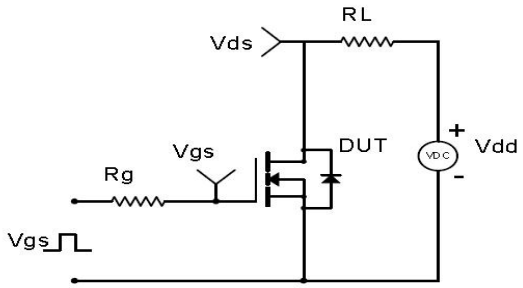
Test Circuit & Waveform

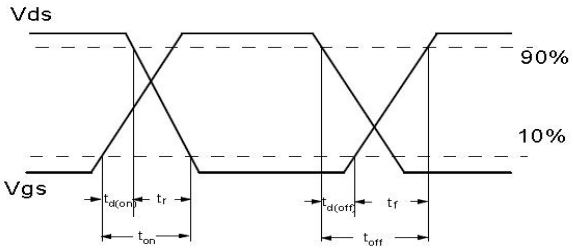
Gate Charge Test Circuit & Waveform



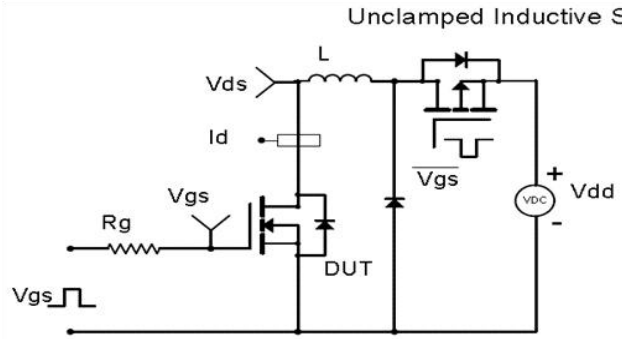


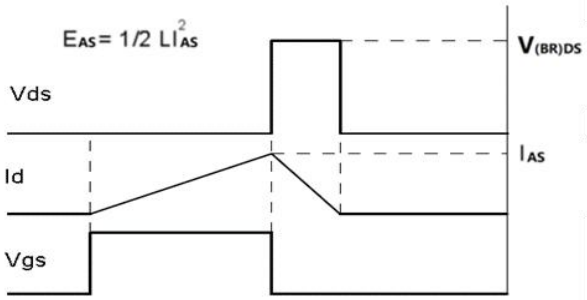
Resistive Switching Test Circuit & Waveforms



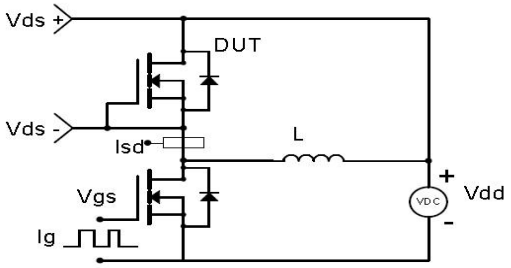


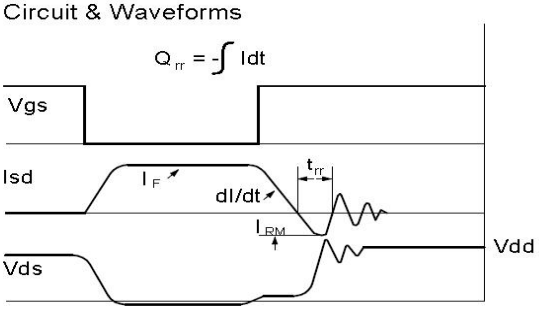
Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



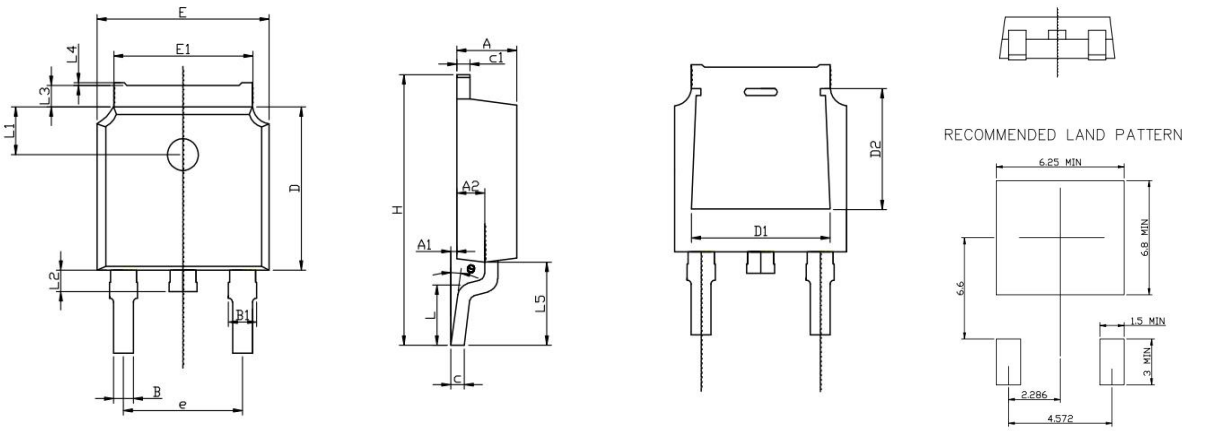


Diode Recovery Test Circuit & Waveforms





Package Outline: TO-252



UNIT: mm

SYMBOL	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	2.15	2.45	0.085	0.096
A1	0.05	0.20	0.002	0.008
A2	0.91	1.22	0.036	0.048
B	0.66	0.86	0.026	0.034
B1	0.93	1.23	0.037	0.048
C	0.40	0.60	0.016	0.024
C1	0.40	0.60	0.016	0.024
D	5.95	6.25	0.234	0.246
D1	4.80		0.189	
D2	3.80		0.150	
E	6.45	6.75	0.254	0.266
E1	5.12	5.52	0.202	0.217
L	1.65		0.065	
L1	1.58	1.98	0.062	0.078
L2	0.60	1.00	0.024	0.039
L3	0.70	1.00	0.028	0.039
L4	0.00	0.20	0.000	0.008
L5	2.80	3.40	0.110	0.134
H	9.80	10.40	0.386	0.409
θ	0.00	8.00	0.000	0.315
e	4.57		0.180	

Disclaimer

Any and all semicondutor products have certain probability to fail or malfunction, which may result in personal injury, death or property damage. Customer are solely responsible for providing adequate safe measures when design their systems.

The product is not intended for use in applications that require extraordinary levels of quality and reliability, such as aviation/aerospace and life-support devices or systems.

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