华润微电子(重庆)有限公司

CRJD1KN65G2

SJMOS N-MOSFET 650V, 0.9Ω, 5A

Features

- CRM(CQ) Super_Junction technology
- Much lower Ron*A performance for On-state efficiency
- Better efficiency due to very low FOM

Product Summary

$V_{DS,min}$	650V
$R_{DS(on),typ}$	0.9Ω
I_D	5A

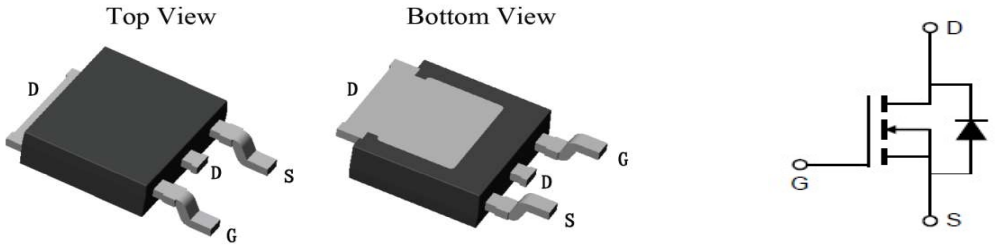
Applications

- LED/LCD/PDP TV and monitor Lighting
- Solar/Renewable/UPS-Micro Inverter System
- Charger
- Power Supply

100% DVDS Tested

100% Avalanche Tested

RoHS HF



Package Marking and Ordering Information

Part #	Marking	Package	Packing	Reel Size	Tape Width	Qty
CRJD1KN65G2	J1KN65G2	TO-252	Tape&Reel	N/A	N/A	2500pcs

Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Drain-source voltage	V_{DS}	650	V
Continuous drain current [1)] T_C = 25°C T_C = 100°C	I_D	 5 3	A
Pulsed drain current [2)](T_C = 25°C, t_p limited by $T_{j,max}$)	$I_{D,pulse}$	20	A
Avalanche energy, single pulse (L=30mH)	E_{AS}	50	mJ
MOSFET dv/dt ruggedness	dv/dt	50	V/ns
Gate-Source voltage	V_{GS}	±30	V
Power dissipation (T_C = 25°C)	P_{tot}	58	W
Continuous diode forward current(T_C = 25°C)	I_S	5	A
Diode pulse current [2)] (T_C = 25°C)	$I_{S,pulse}$	20	A
Recovery diode dv/dt [3)]	dv/dt	50	V/ns
Operating junction and storage temperature	T_j , T_{stg}	-55...+150	°C

1) Limited by $T_{j,max}$. Maximum Duty Cycle D = 0.50
2) Pulse width t_p limited by $T_{j,max}$
3) Identical low side and high side switch with identical R_g

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Thermal Resistance

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		
Thermal resistance, junction – case	R_{thJC}	-	1.55	2.17	°C/W	
Thermal resistance, junction – ambient	R_{thJA}	-	-	139	°C/W	

Electrical Characteristic (at T_j=25℃, 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=250μA
Gate threshold voltage	$V_{GS(th)}$	3	-	4	V	V_{DS}=V_{GS},I_D=250μA
Zero gate voltage drain current	I_{DSS}	- -	- 1	1 -	μA	V_{DS}=650V,V_{GS}=0V T_j=25°C T_j=150°C
Gate-source leakage current	I_{GSS}	-	-	±100	nA	V_{GS}=±30V,V_{DS}=0V
Drain-source on-state resistance	$R_{DS(on)}$	- -	0.9 2.2	1.0 -	Ω	V_{GS}=10V, I_D=2A T_j=25°C T_j=150°C
Transconductance	g_{fs}	-	3.6	-	S	V_{DS}=20V,I_D=2A
Dynamic Characteristic						
Input Capacitance	C_{iss}	-	256	-	pF	V_{GS}=0V, V_{DS}=100V, f=1MHz
Output Capacitance	C_{oss}	-	17	-		
Reverse Transfer Capacitance	C_{rss}	-	1	-		
Gate Total Charge	Q_g	-	9	-	nC	V_{GS}=10V, V_{DS}=480V, I_D=2A
Gate-Source charge	Q_{gs}	-	2	-		
Gate-Drain charge	Q_{gd}	-	4	-		
Gate plateau voltage	$V_{plateau}$	-	5.4	-	V	
Turn-on delay time	$t_{d(on)}$	-	13.5	-	ns	V_{GS}=10V, I_D=2A, V_{DS}=400V, R_g=27Ω
Rise time	t_r	-	9	-		
Turn-off delay time	$t_{d(off)}$	-	40	-		
Fall time	t_f	-	78	-		
Gate resistance	$R_{g,int}$	-	7	-	Ω	f=1MHz

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Body Diode Characteristic

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		
Body Diode Forward Voltage	V_{SD}	0.6	0.83	1.1	V	V_{GS}=0V,I_{SD}=2A
Body Diode Reverse Recovery Time	t_{rr}	-	144	-	ns	I_{SD}=2A di_F/dt=100A/μs V_{DS}=100V
Body Diode Reverse Recovery Charge	Q_{rr}	-	0.87	-	μC	

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Typical Performance Characteristics

Fig 1. Output Characteristics (T_j=25℃)

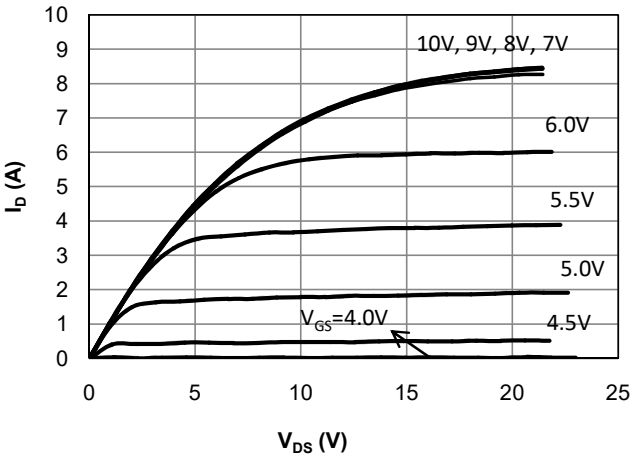


Fig 2. Output Characteristics (T_j=150℃)

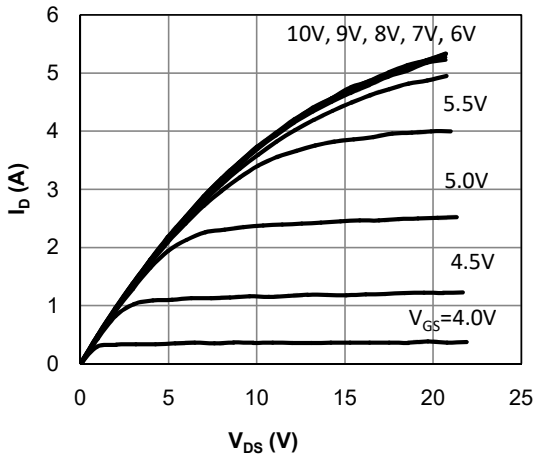


Fig 3: Transfer Characteristics

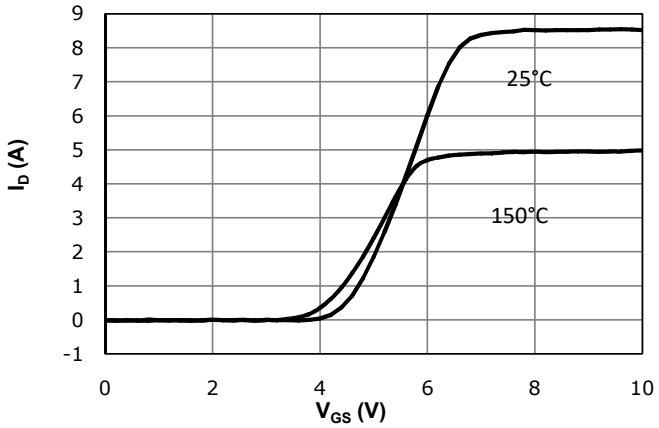


Fig 4: V_{TH} vs. T_j Temperature Characteristics

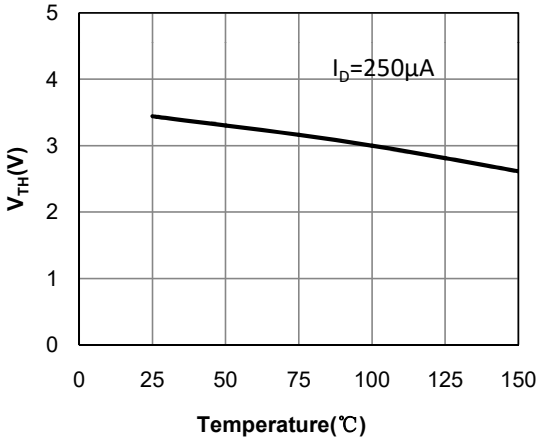


Fig 5: $R_{DS(on)}$ vs. I_{DS} Characteristics(T_j=25℃)

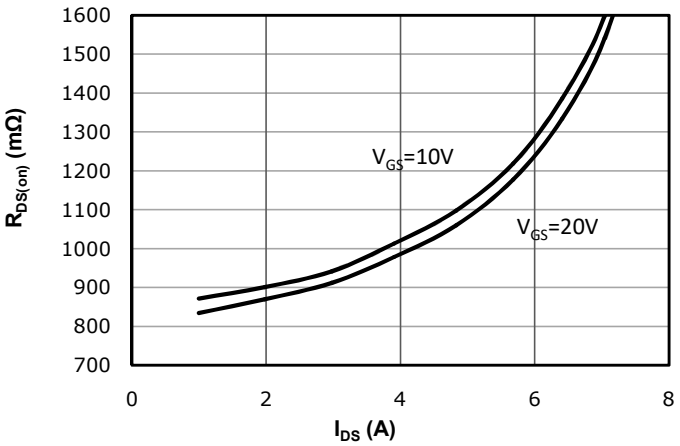
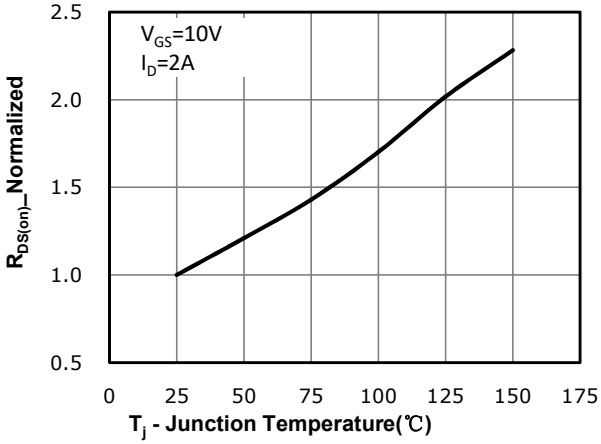


Fig 6: $R_{DS(on)}$ vs. Temperature



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Fig 7: BV_{DSS} vs. Temperature

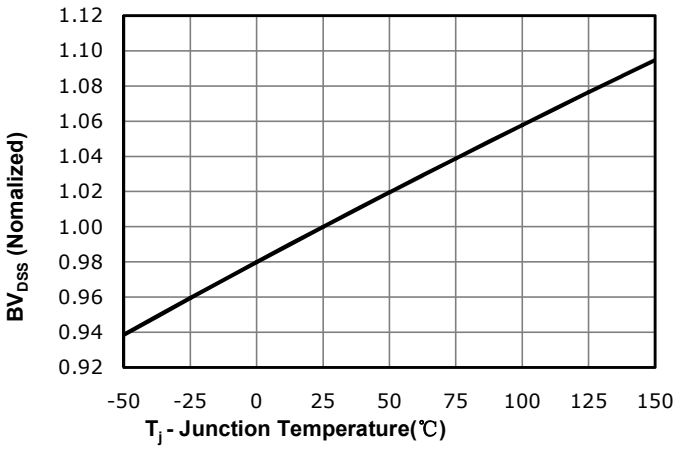


Fig 8: $R_{DS(on)}$ vs. Gate Voltage

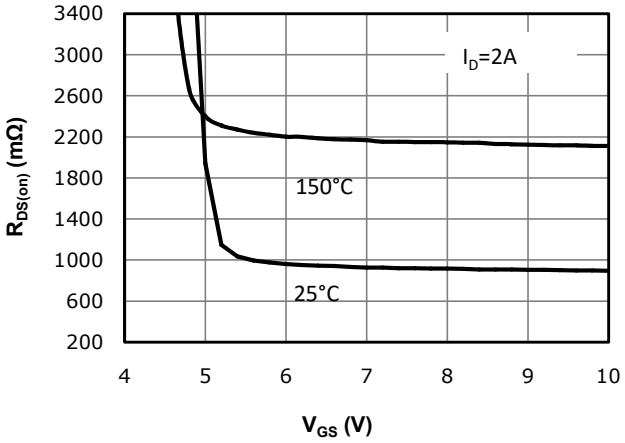


Fig 9: Body-diode Forward Characteristics

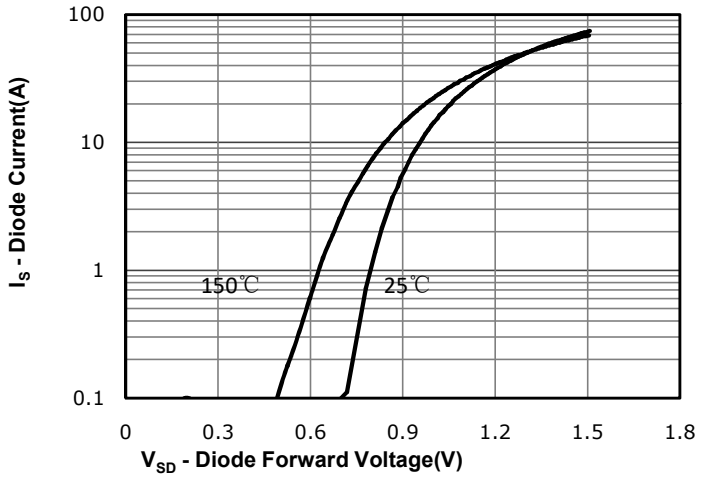


Fig 10: Gate Charge Characteristics

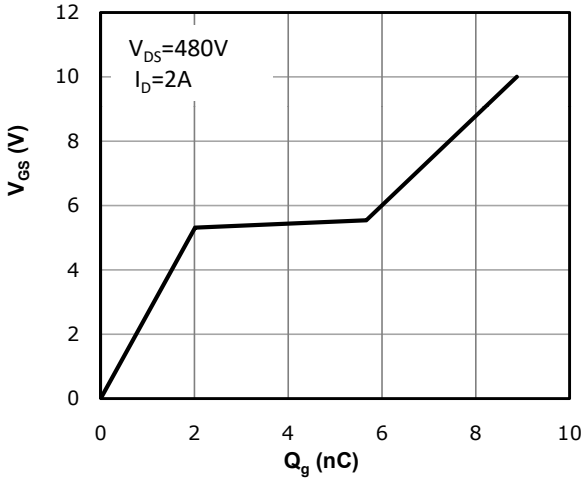


Fig 11: Capacitance Characteristics

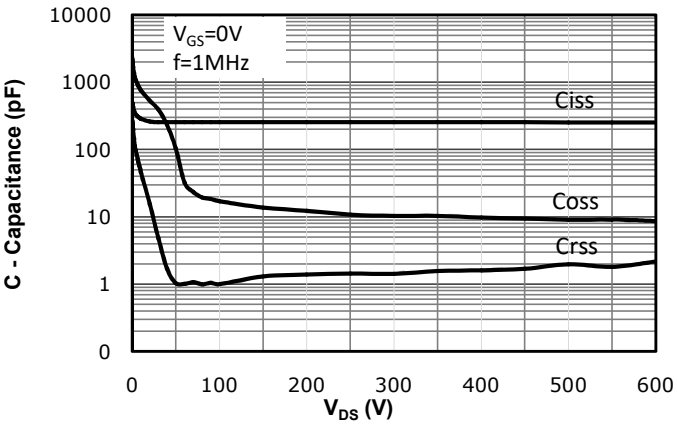
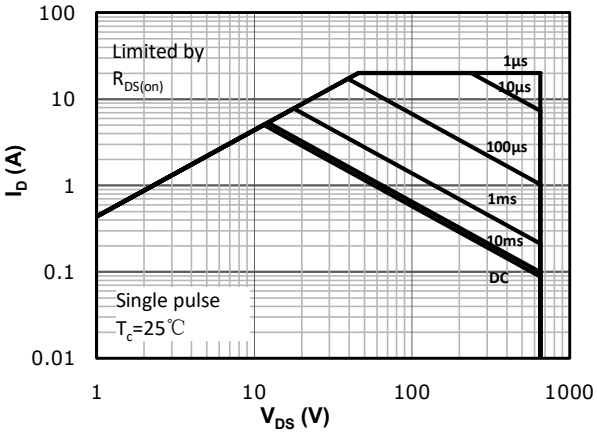
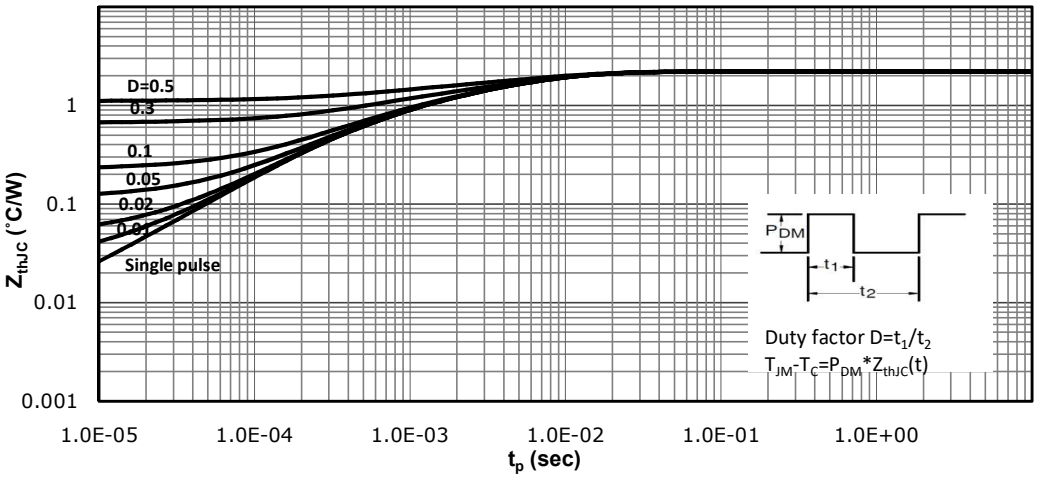


Fig 12: Safe Operating Area



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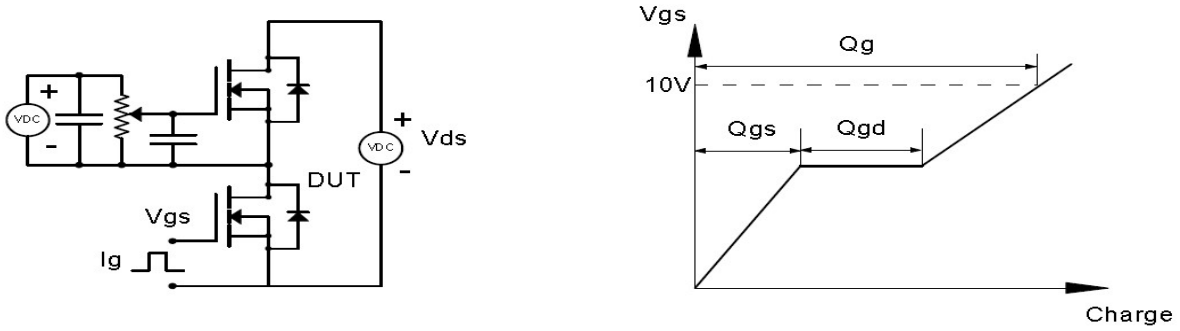
Fig 13: Max. Transient Thermal Impedance



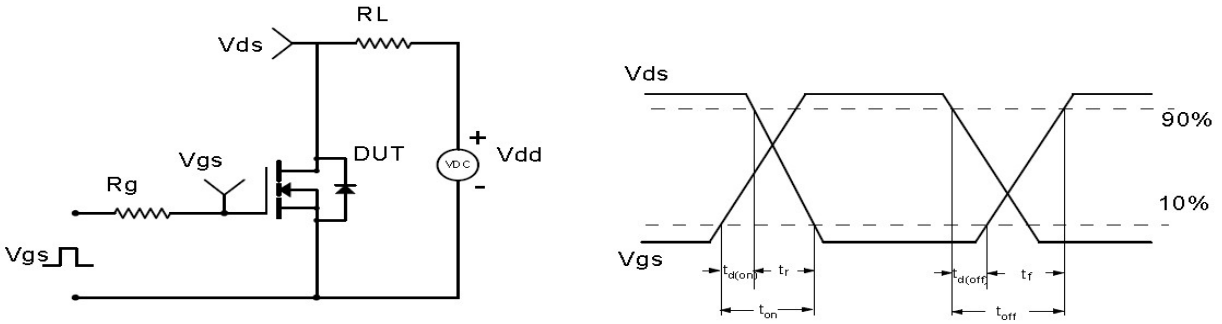
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Test Circuit & Waveform

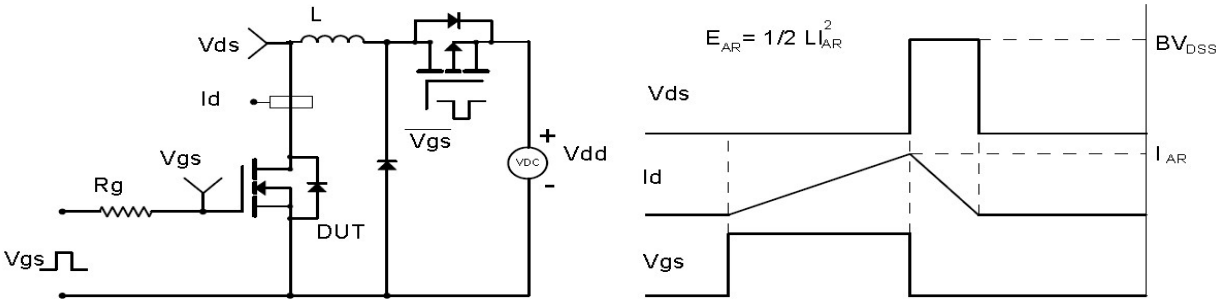
Gate Charge Test Circuit & Waveform



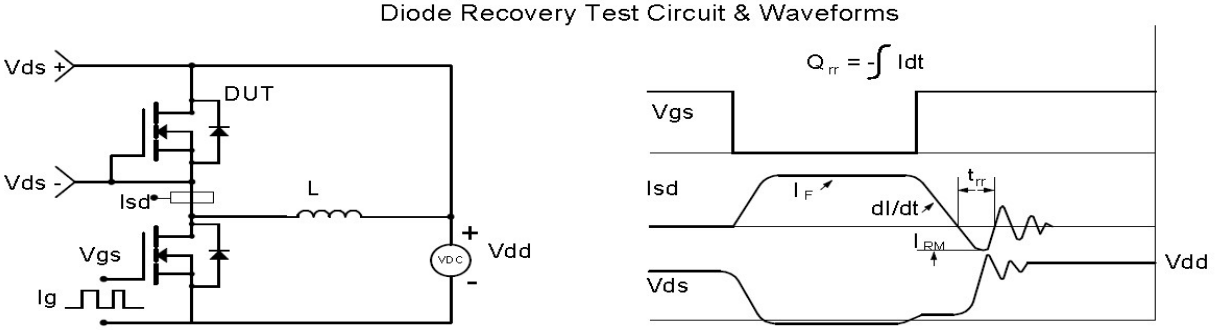
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms

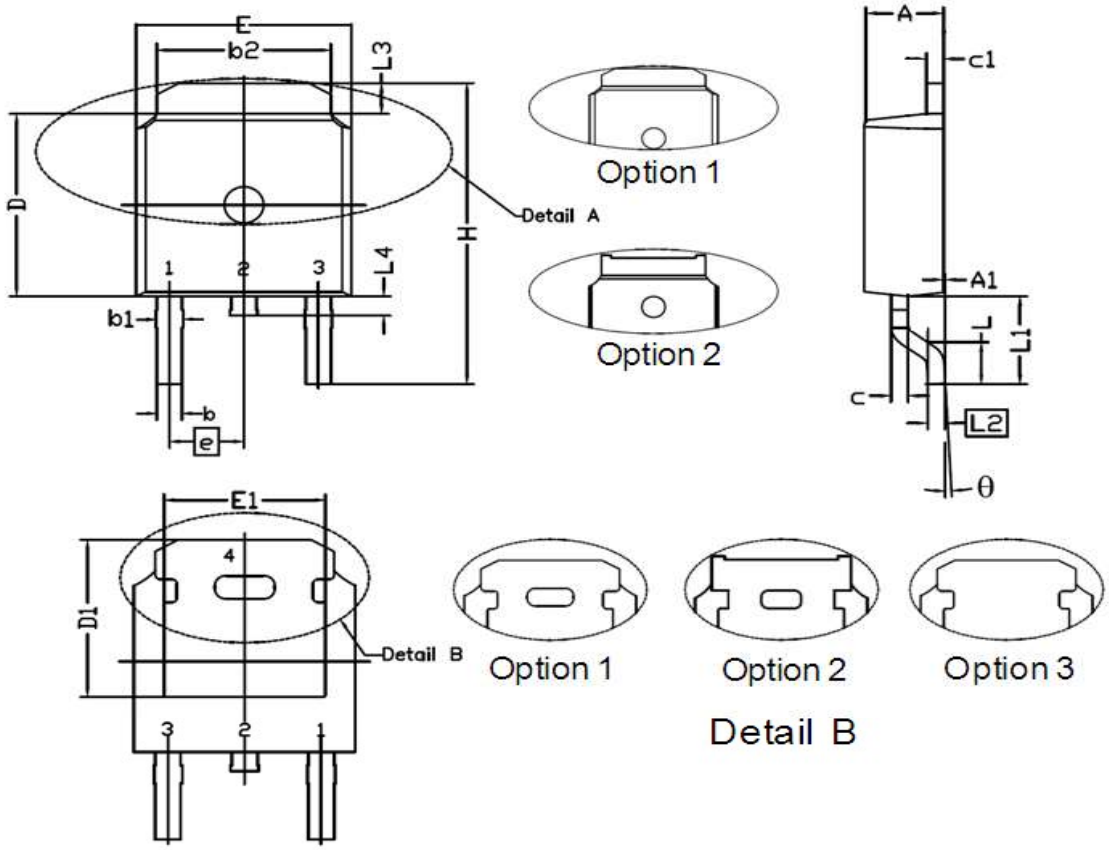


Diode Recovery Test Circuit & Waveforms



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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
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	5.21	--	0.205	--
e	2.29 BSC.		0.090 BSC.	
E	6.30	6.90	0.248	0.272
E1	4.40	--	0.173	--
H	9.40	10.48	0.370	0.413
L	1.38	1.78	0.054	0.070
L1	2.92 REF		0.115 REF	
L2	0.508 BSC.		0.020 BSC.	
L3	0.72	1.35	0.028	0.053
L4	0.60	1.20	0.024	0.047
θ	0°	10°	0°	10°

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Marking:



NOTE:
NXBBAAAA

N	—WB code (Usually omitted)
X	—Assembly location code
BB	—Fab code
AAAA	—Lot code

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Revision History

Revison	Date	Major changes
2.0	2023/7/5	Update Marking and I_D

Disclaimer

Unless otherwise specified in the datasheet, the product is designed and qulified as a standard commercial product and is not intended for use in applications that require extraordinary levels of quality and reliability, such as automotive, aviation/aerospace and life-support devices or systems.

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.

CRM(CQ) reserves the right to improve product design, function and reliability without notice.

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