华润微电子(重庆)有限公司

CRSM100N15N3Z

SkyMOS3 N-MOSFET 150V, 9.5mΩ, 75A

Features

- Uses CRM(CQ) advanced SkyMOS3 technology
- Extremely low on-resistance $R_{DS(on)}$
- Excellent Q_gx$R_{DS(on)}$ product(FOM)
- Qualified according to JEDEC criteria

Applications

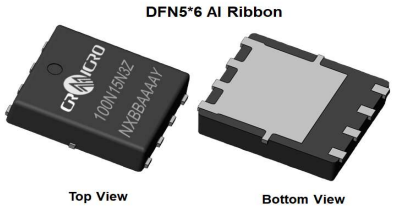
- Synchronous Rectification for AC/DC Quick Charger
- Battery management
- UPS (Uninterrupible Power Supplies)

Product Summary

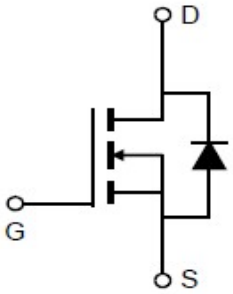
V_{DS}	150V
$R_{DS(on)@10V\ typ}$	9.5mΩ
I_D	75A

100% Avalanche Tested
100% DVDS Tested

RoHS HF



CRSM100N15N3Z



Package Marking and Ordering Information

Part #	Marking	Package	Packing	Reel Size	Tape Width	Qty
CRSM100N15N3Z	100N15N3Z	DFN5*6 Rib	Tape&Reel	N/A	N/A	5000/4000pcs

Absolute Maximum Ratings

Parameter	**Symbol**	**Value**	**Unit**
Drain-source voltage	V_{DS}	150	V
Continuous drain current T_C = 25°C (Silicon limit) T_C = 100°C (Silicon limit)	I_D	 75 52	A
Pulsed drain current (T_C = 25°C, t_p limited by T_{jmax})	$I_{D\ pulse}$	300	A
Avalanche energy, single pulse (Ias=30A, Rg=25Ω)	E_{AS}	225	mJ
Gate-Source voltage	V_{GS}	±20	V
Power dissipation (T_C = 25°C)	P_{tot}	128	W
Operating junction and storage temperature	T_j , T_{stg}	-55...+150	°C
Soldering temperature, wave soldering only allowed at leads (1.6mm from case for 10s)	Tsold	260	°C

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Thermal Resistance

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		
Thermal resistance, junction – case.	RthJC	-	0.75	1.0	°C/W	-
Thermal resistance, junction - ambient(min. footprint)	RthJA	-	-	60.5	°C/W	-

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}	150	-	-	V	V_{GS}=0V, I_D=250uA
Gate threshold voltage	$V_{GS(th)}$	2.0	3.0	4.0	V	V_{DS}=V_{GS},I_D=250uA
Zero gate voltage drain current	I_{DSS}	-	0.1	1	μA	V_{DS}=120V,V_{GS}=0V T_j=25°C
		-	10	100		T_j=125°C
Gate-source leakage current	I_{GSS}	-	-	100	nA	V_{GS}=±20V,V_{DS}=0V
Drain-source on-state resistance	$R_{DS(on)}$	-	9.5	10.8	mΩ	V_{GS}=10V, I_D=40A
		-	10.5	12.1		V_{GS}=8V, I_D=20A
Transconductance	g_{fs}	-	55	-	S	V_{DS}=5V,I_D=40A
Dynamic Characteristic						
Input Capacitance	C_{iss}	1470.7	2206	3309	pF	V_{GS}=0V, V_{DS}=75V, f=1MHz
Output Capacitance	C_{oss}	254.2	381.3	571.95		
Reverse Transfer Capacitance	C_{rss}	20	30	60		
Gate Total Charge	Q_G	22.7	34	51.0	nC	V_{GS}=10V, V_{DS}=75V, I_D=40A, f=1MHz
Gate-Source charge	Q_{gs}	9.9	14.9	22.4		
Gate-Drain charge	Q_{gd}	4.8	7.2	10.8		
Turn-on delay time	$t_{d(on)}$	7.3	14.6	29.2	ns	V_{GS}=10V, V_{DD}=75V, ID=44 A, R_{G_ext}=2.7Ω
Rise time	t_r	40.3	80.6	161.2		
Turn-off delay time	$t_{d(off)}$	11.15	22.3	44.6		
Fall time	t_f	29.35	58.7	117.4		

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Gate resistance	R_G	1	1.45	2.2	Ω	V_{GS}=0V, V_{DS}=0V, f=1MHz

Body Diode Characteristic

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		
Body Diode Forward Voltage	V_{SD}	0.7	1.00	1.30	V	V_{GS}=0V,I_{SD}=40A
Body Diode Continuous Forward Current	Is	-	-	75	A	TC = 25°C
Body Diode Pulsed Current	Is pulse	-	-	300	A	TC = 25°C
Body Diode Reverse Recovery Time	t_{rr}	49.26	73.89	110.835	ns	I_F=40A, dI/dt=100A/μs
Body Diode Reverse Recovery Charge	Q_{rr}	114.67	172	258	nC	

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Typical Performance Characteristics

Fig 1: Output Characteristics

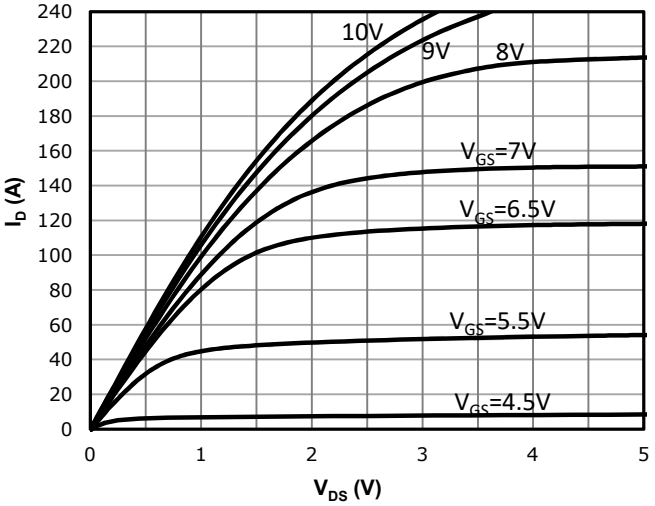


Fig 2: Transfer Characteristics

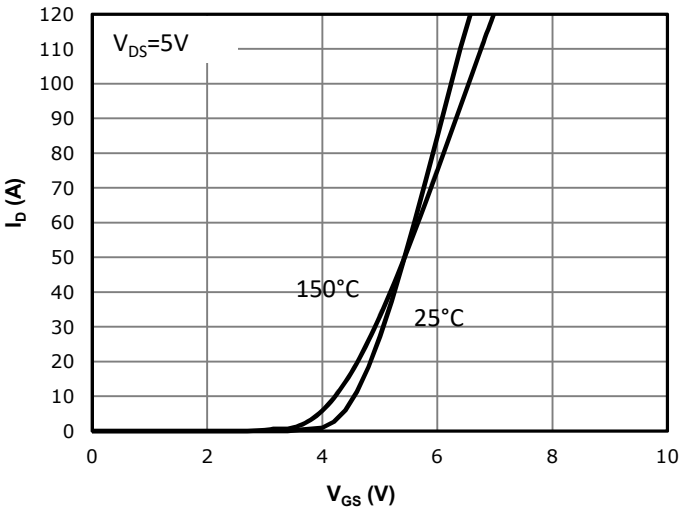


Fig 3: Rds(on) vs Drain Current and Gate Voltage

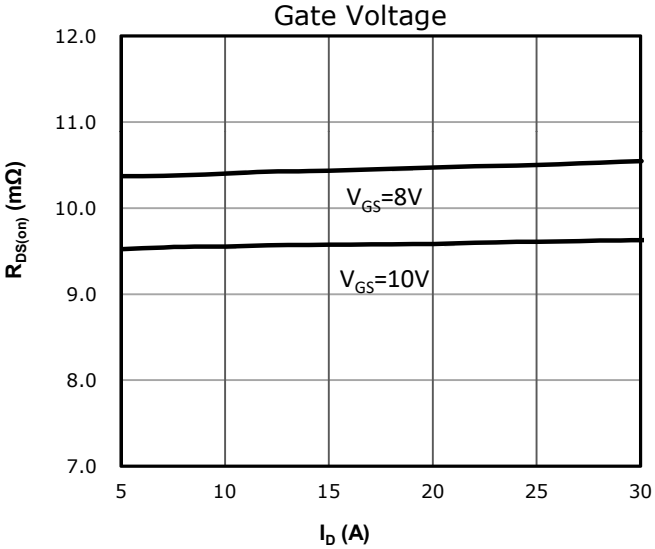


Fig 4: Rds(on) vs Gate Voltage

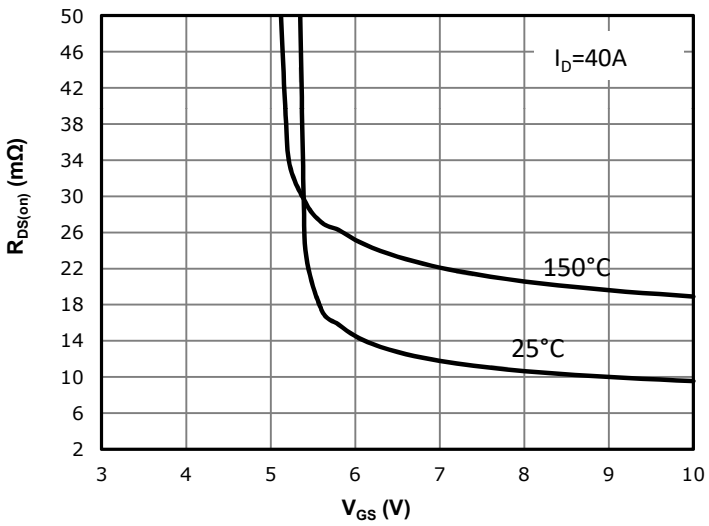


Fig 5: Rds(on) vs. Temperature

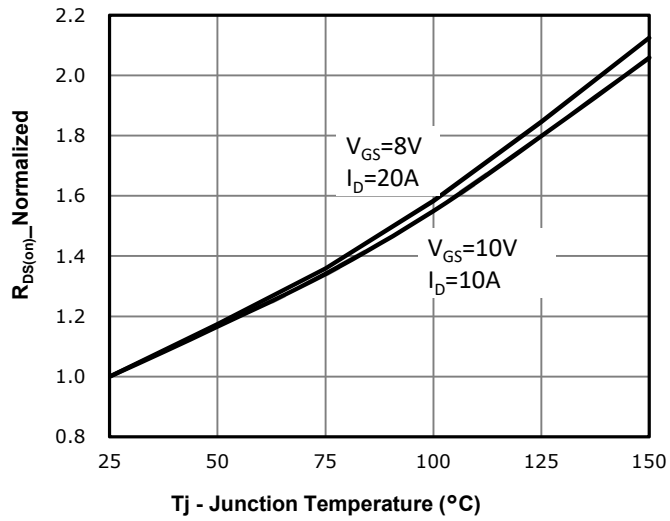
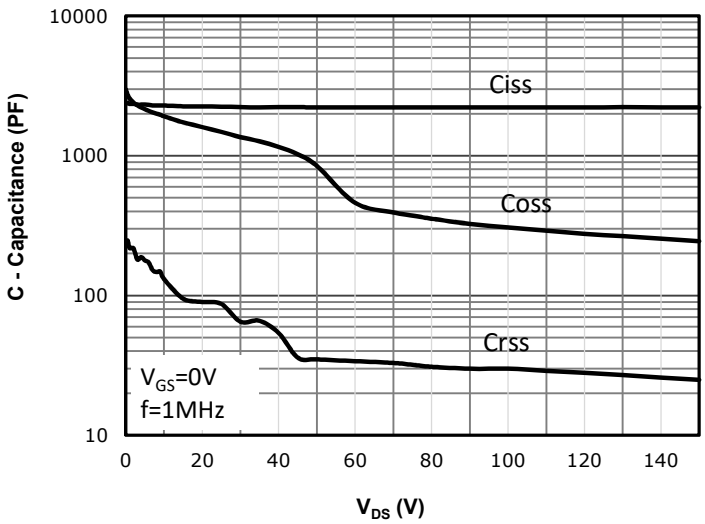


Fig 6: Capacitance Characteristics



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Fig 7: Gate ChargeCharacteristics

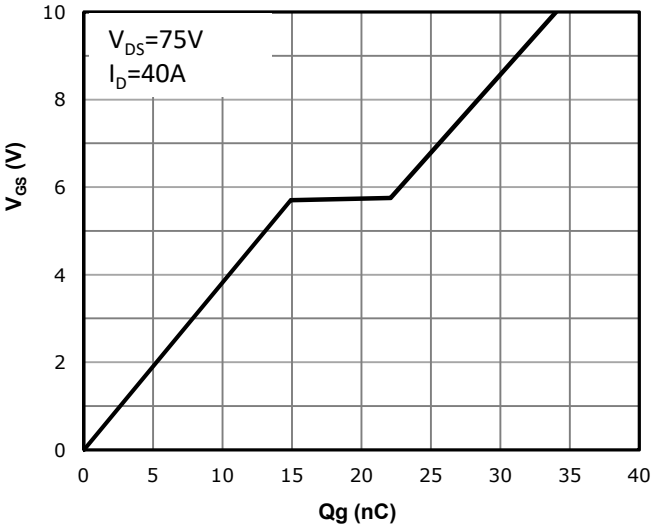


Fig 8: Body-diode Forward Characteristics

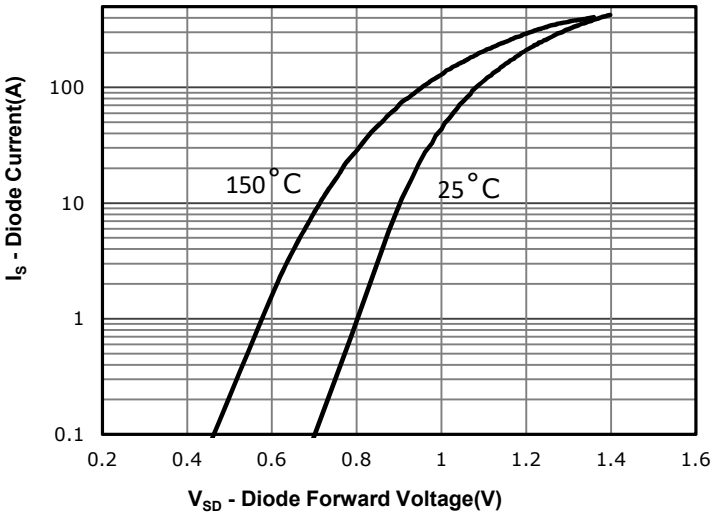


Fig 9: Power Dissipation

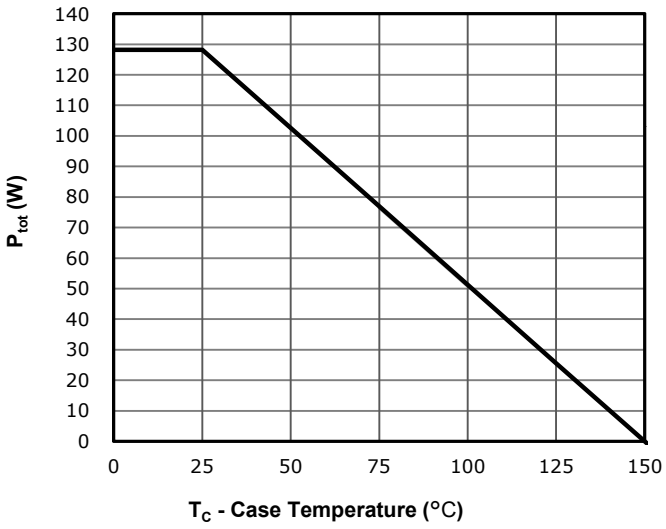


Fig 10: Drain Current Derating

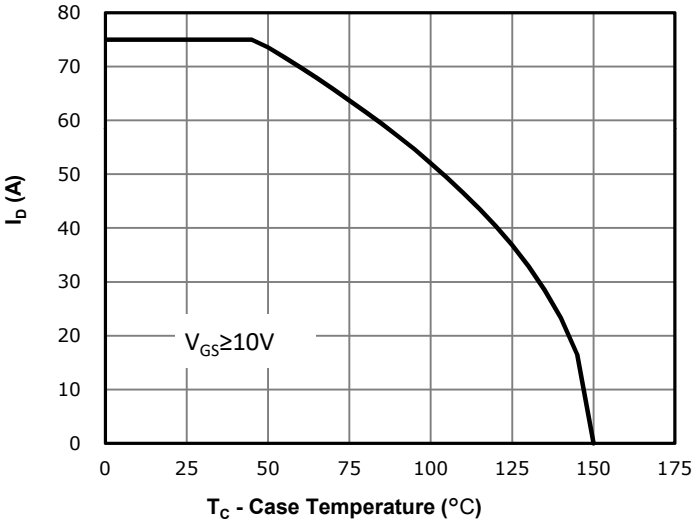
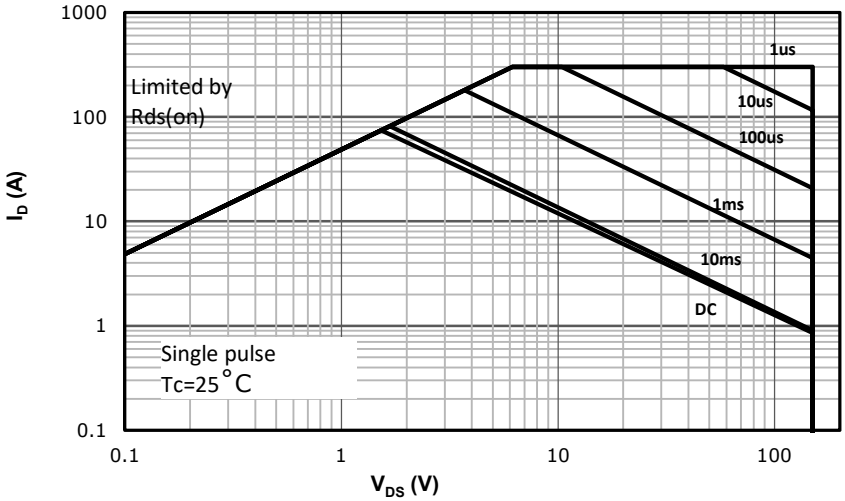
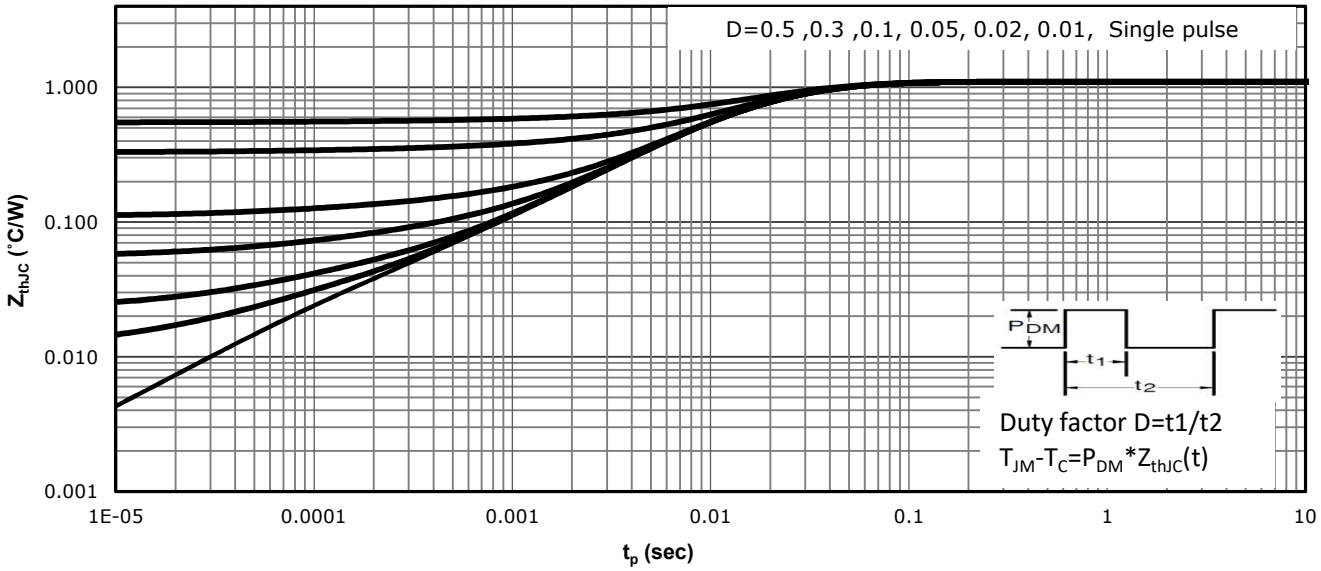


Fig 11: Safe Operating Area



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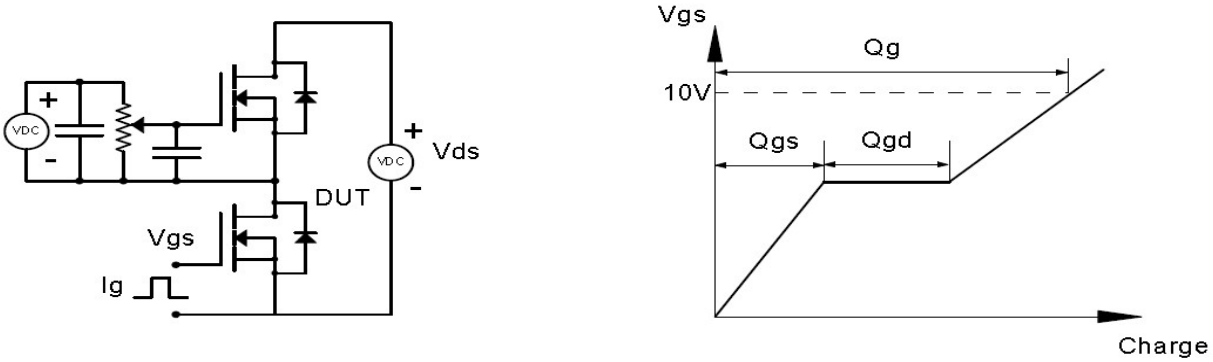
Fig 12: Max. Transient Thermal Impedance



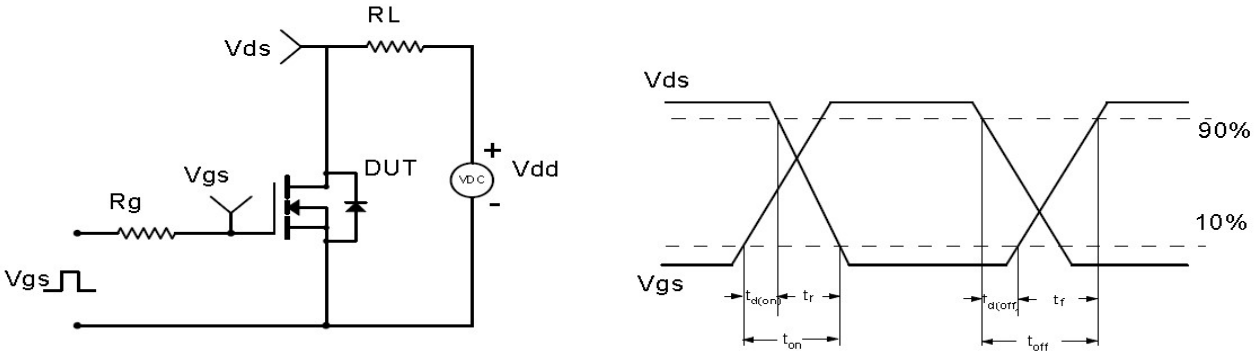
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Test Circuit & Waveform

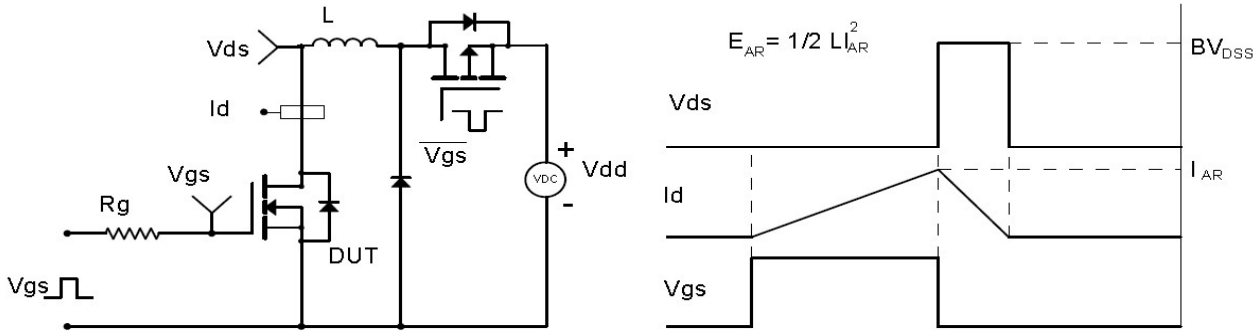
Gate Charge Test Circuit & Waveform



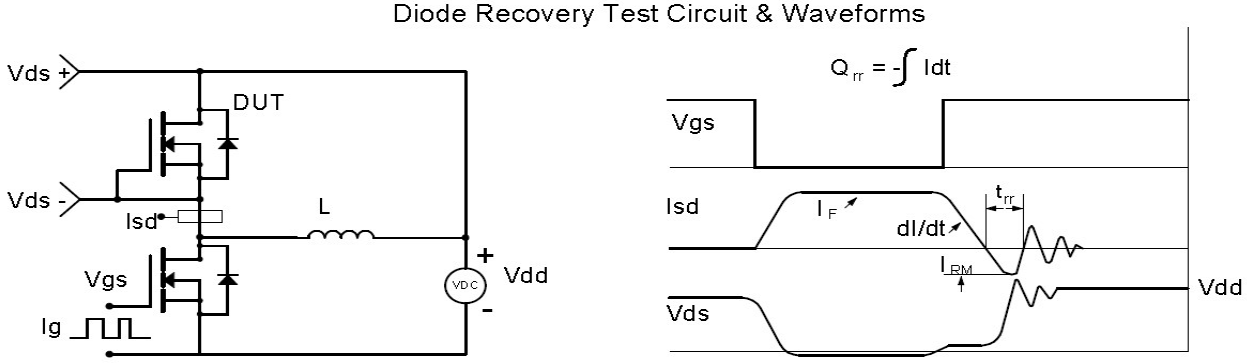
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms

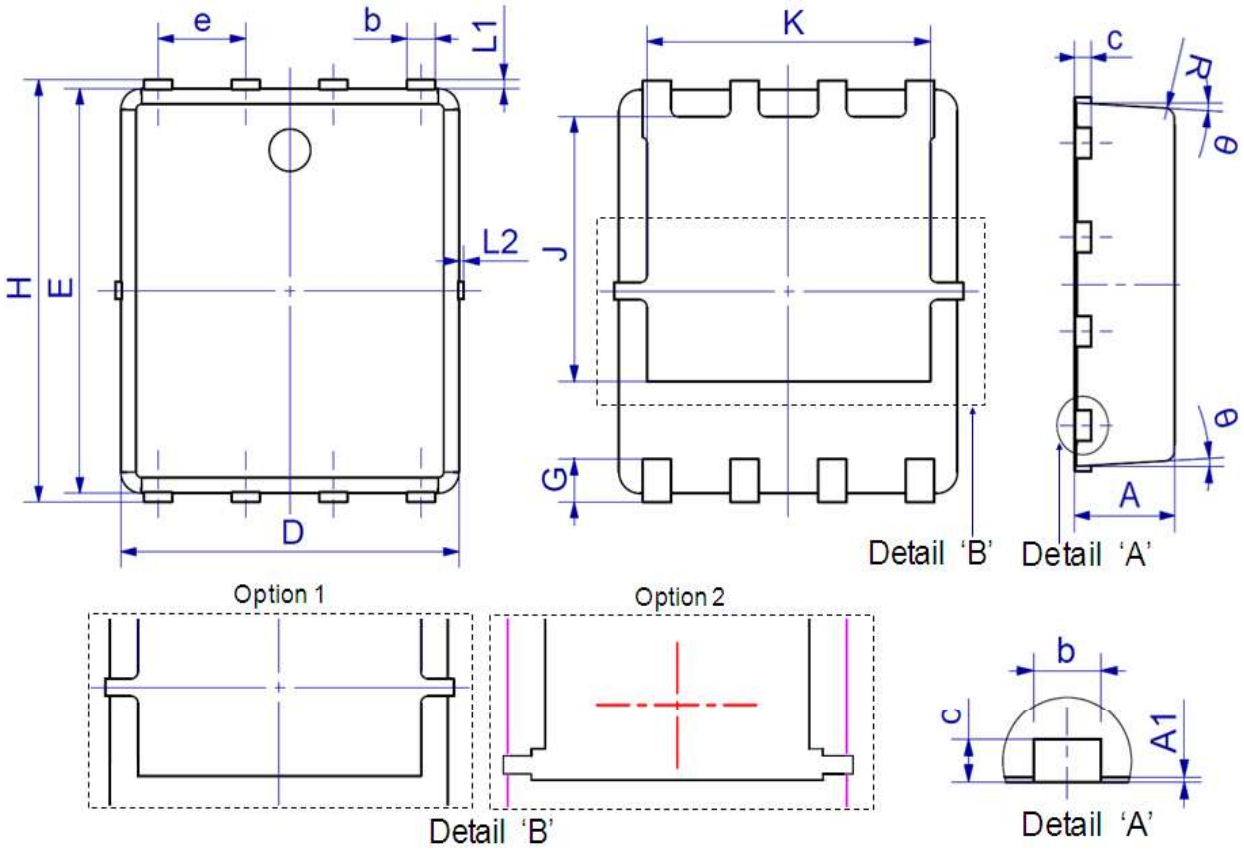


Diode Recovery Test Circuit & Waveforms



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Package Outline: DFN5X6



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.80	1.20	0.031	0.047
A1	0.00	0.05	0.000	0.002
b	0.30	0.51	0.012	0.020
c	0.15	0.35	0.006	0.014
D	4.80	5.40	0.189	0.213
e	1.27 BSC		0.050 BSC	
E	5.66	6.06	0.223	0.239
G	0.30	0.71	0.012	0.028
H	5.90	6.35	0.232	0.250
J	3.32	3.92	0.131	0.154
K	3.61	4.25	0.142	0.167
L1	0.05	0.25	0.002	0.010
L2	0.00	0.15	0.000	0.006
R	0.25 REF		0.010 REF	
θ	0°	12°	0°	12°

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Marking



NOTE:
NXBBAAAAY

N	—Wire Bond code
X	—Assembly location code
BB	—Fab code
AAAA	—Lot code
Y	—Bin code

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Revision History

Revison	Date	Major changes
1.0	2022/11/9	Release of Preliminary Version.

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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