华润微电子(重庆)有限公司

CRJM390N65GC

SJMOS N-MOSFET 650V, 0.39Ω, 9A

Features

- CRM(CQ) Super_Junction technology
- Much lower Ron*A performance for On-state efficiency
- Much lower FOM for fast switching efficiency

Product Summary

VDS	650V
$R_{DS(on)\_typ}$	0.39Ω
I_D	9A

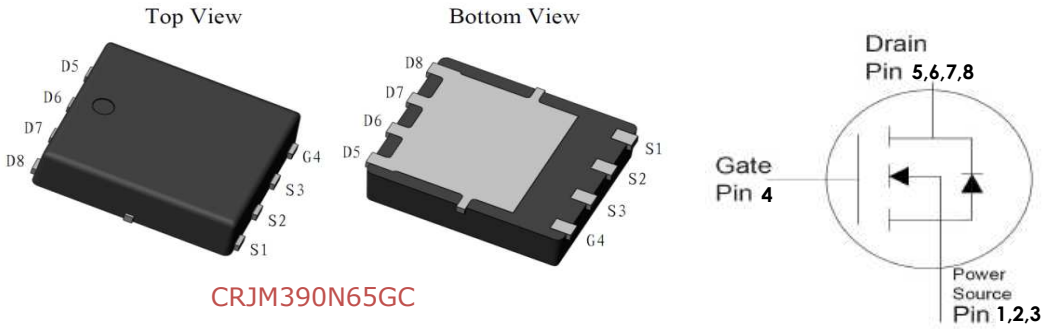
Applications

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

100% DVDS Tested

100% Avalanche Tested

RoHS HF



CRJM390N65GC

Package Marking and Ordering Information

Part #	Marking	Package	Packing	Reel Size	Tape Width	Qty
CRJM390N65GC	-	PDFN5*6	Tape&Reel	N/A	N/A	4000/5000pcs

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	I_D	 9 6	A
Pulsed drain current (T_C = 25°C, t_p limited by T_{jmax})	$I_{D\ pulse}$	36	A
Avalanche energy, single pulse (L=60mH, Rg=30Ω)	E_{AS}	120	mJ
MOSFET dv/dt ruggedness(V_{DS}≤400V)	dv/dt	50	V/ns
Peak Diode recovery dv/dt(I_{SD}≤5.5A,V_{DS}≤400V,T_j= 25°C)		50	
Gate-Source voltage	V_{GS}	±30	V
Power dissipation (T_C = 25°C)	P_{tot}	68	W
Operating junction and storage temperature	T_j , T_{stg}	-55...+150	°C

Thermal Resistance

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		
Thermal resistance, junction – case. Max	RthJC	-	1.32	1.85	°C/W	
Thermal resistance, junction – ambient. Max	RthJA	-	-	82	°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}	650	-	-	V	V_{GS}=0V, I_D=250uA
Gate threshold voltage	$V_{GS(th)}$	3.5	-	4.5	V	V_{DS}=V_{GS},I_D=250uA
Zero gate voltage drain current	I_{DSS}	- -	- 3	1 -	μA	V_{DS}=650V,V_{GS}=0V T_C=25°C T_C=150°C
Gate-source leakage current	I_{GSS}	-	-	±100	nA	V_{GS}=±30V,V_{DS}=0V
Drain-source on-state resistance	$R_{DS(on)}$	- -	0.39 1	0.45 -	Ω	V_{GS}=10V, I_D=5.5A, T_C=25°C T_C=150°C
Transconductance	g_{fs}	-	13	-	S	V_{DS}=20V,I_D=5.5A
Dynamic Characteristic						
Input Capacitance	C_{iss}	-	773	-	pF	V_{GS}=0V, V_{DS}=100V, f=1MHz
Output Capacitance	C_{oss}	-	32	-		
Reverse Transfer Capacitance	C_{rss}	-	23	-		
Gate Total Charge	Q_G	-	22	-	nC	V_{GS}=10V, V_{DS}=480V, I_D=5.5A
Gate-Source charge	Q_{gs}	-	5.4	-		
Gate-Drain charge	Q_{gd}	-	9.1	-		
Turn-on delay time	$t_{d(on)}$	-	20	-	ns	T_j=25°C, V_{GS}=10V, I_D=5.5A, V_{DS}=400V, R_g=27Ω
Rise time	t_r	-	15	-		
Turn-off delay time	$t_{d(off)}$	-	74	-		
Fall time	t_f	-	43	-		
Gate resistance	R_G	-	2.0	-	Ω	f=1MHz

Body Diode Characteristic

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		
Body Diode Forward Voltage	V_{SD}	0.5	0.84	1	V	V_{GS}=0V,I_{SD}=5.5A
Body Diode Reverse Recovery Time	t_{rr}	-	218	-	ns	Isd=5.5A dI/dt=100A/us, Vds=400V
Body Diode Reverse Recovery Charge	Q_{rr}	-	2.35	-	uC	

Typical Performance Characteristics

Fig 1. Output Characteristics (Tj=25℃)

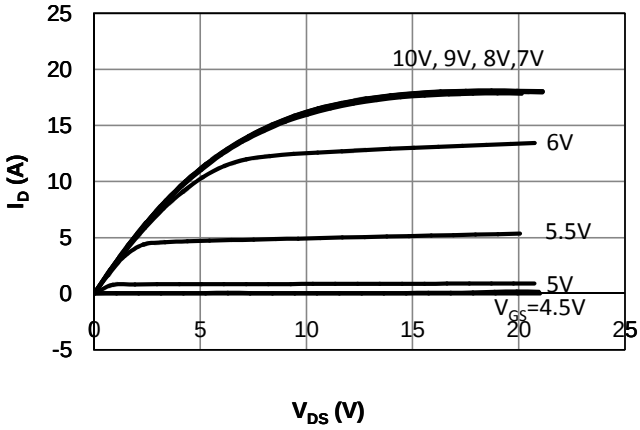


Fig 2. Output Characteristics (Tj=150℃)

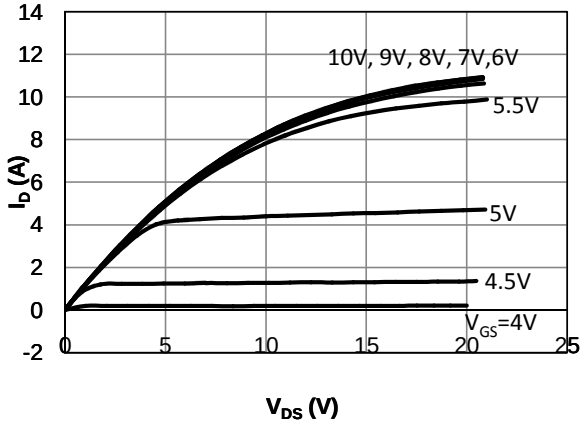


Fig 3: Transfer Characteristics

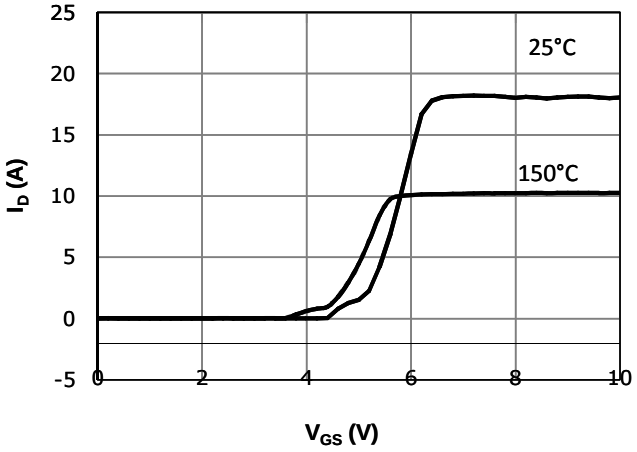


Fig 4: V_{TH} Vs Tj Temperature Characteristics

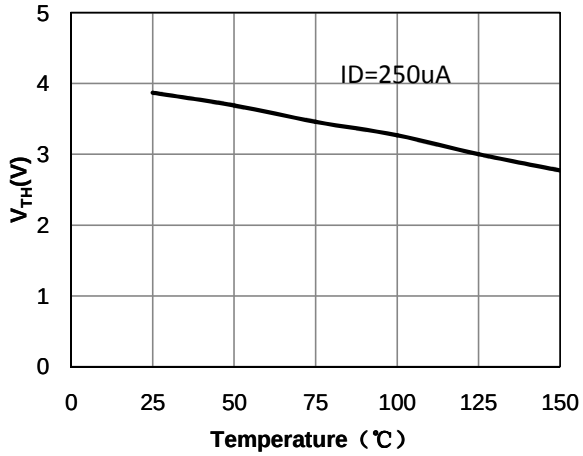


Fig 5: Rdson Vs Ids Characteristics(Tc=25℃)

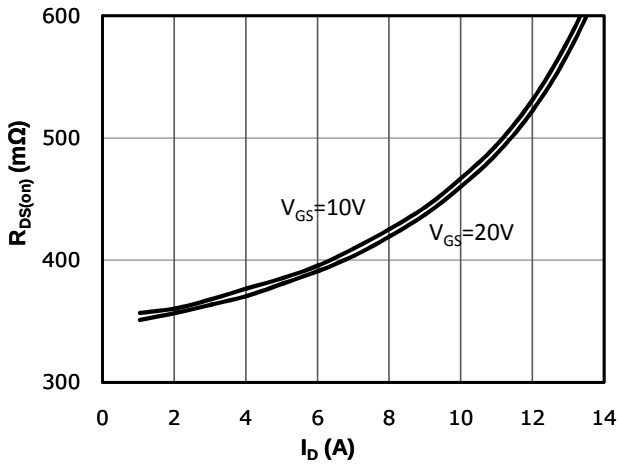


Fig 6: Rds(on) vs. Temperature

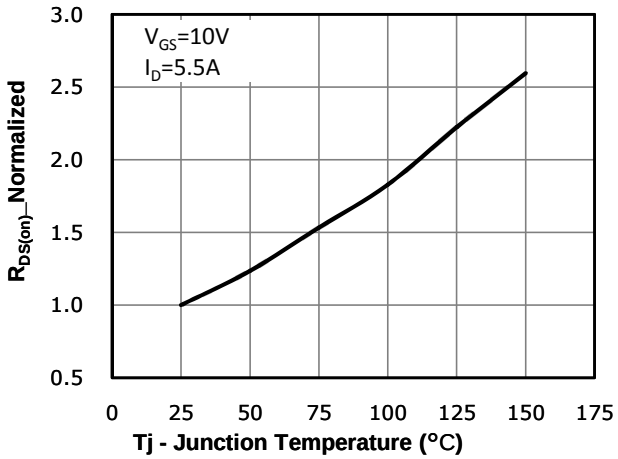


Fig 7: BVDSS vs. Temperature

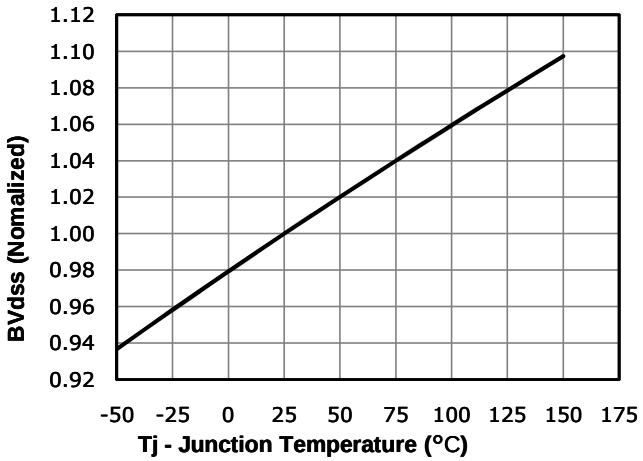


Fig 8: Rds(on) vs Gate Voltage

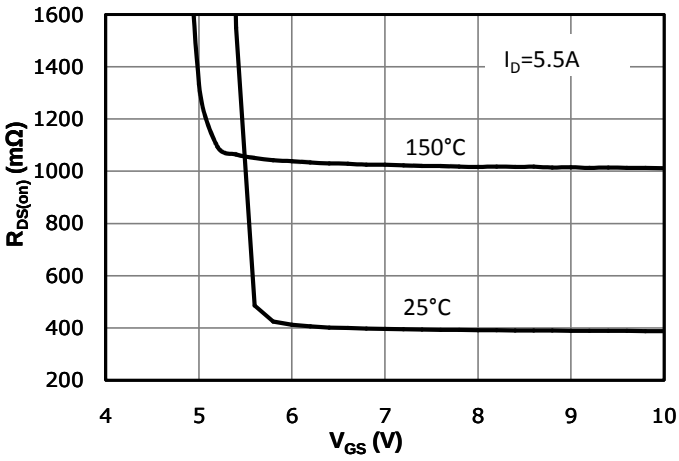


Fig 9: Body-diode Forward Characteristics

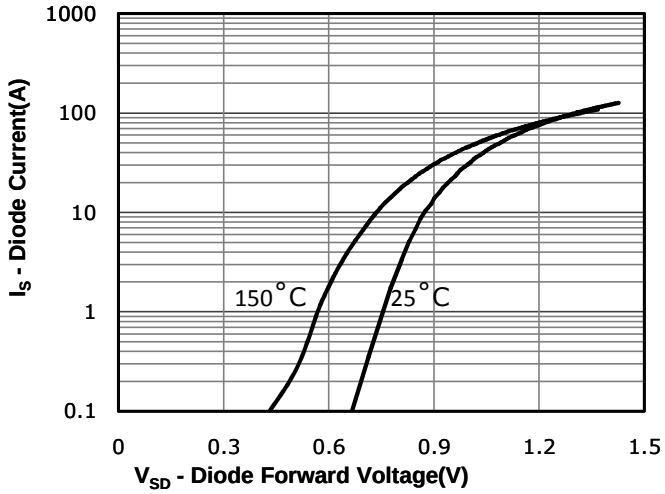


Fig 10: Gate Charge Characteristics

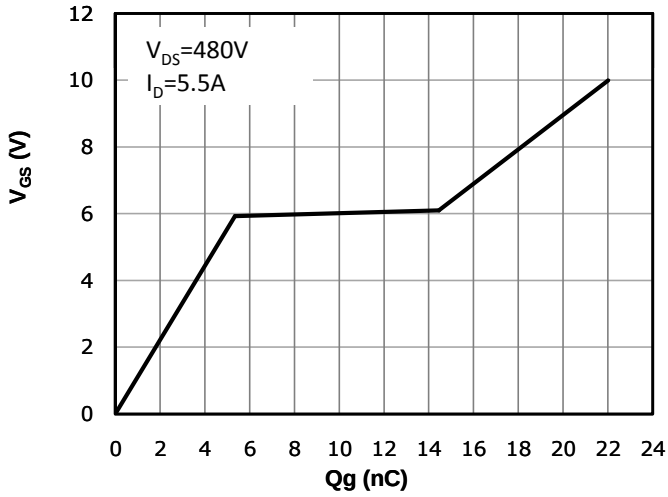


Fig 11: Capacitance Characteristics

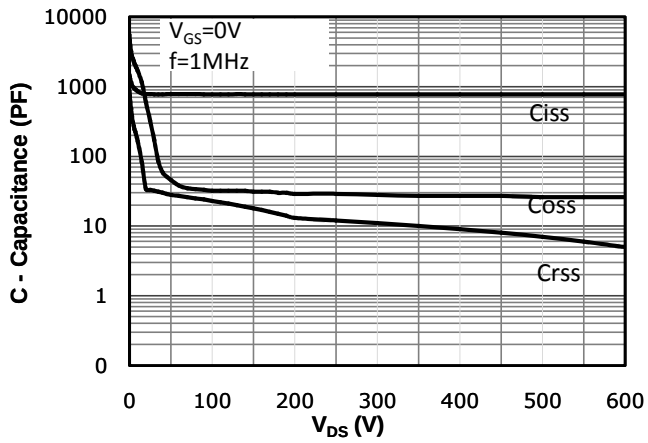


Fig 12: Safe Operating Area

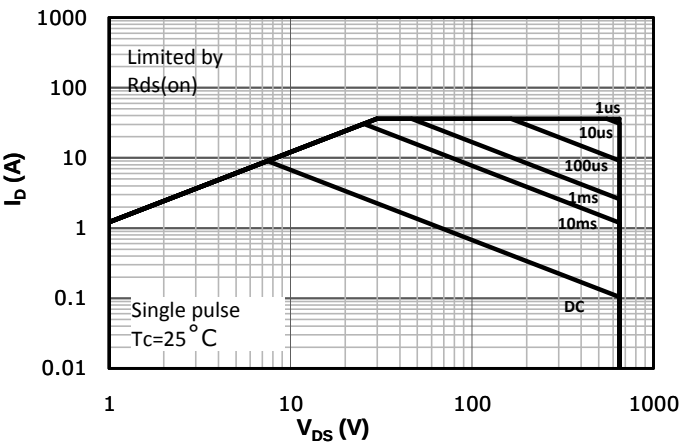
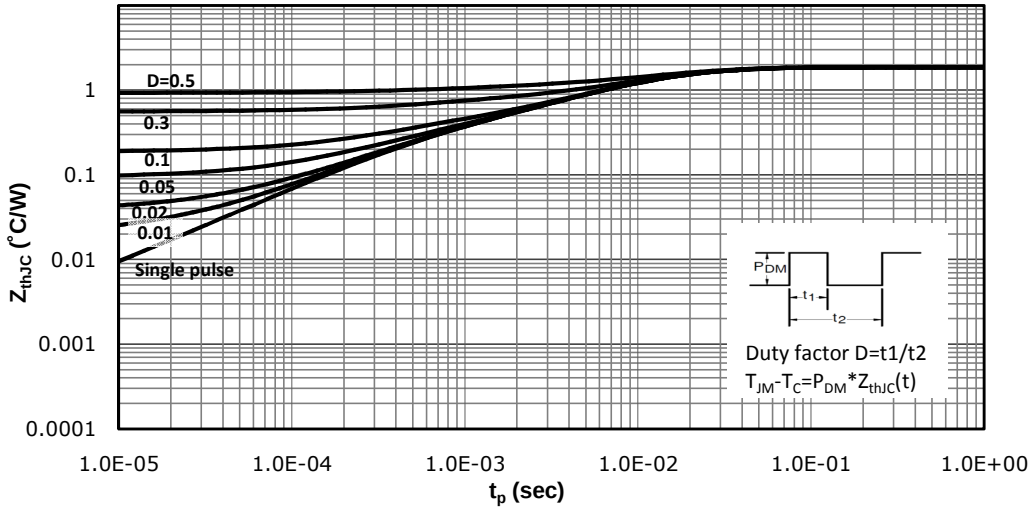
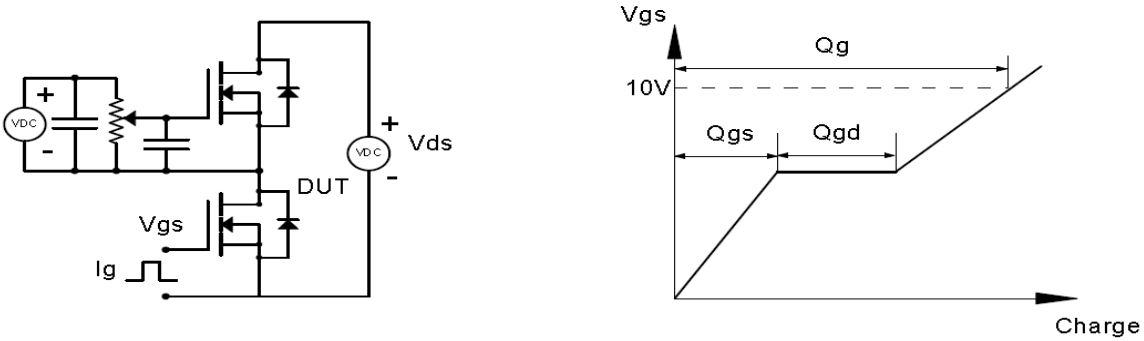


Fig 13: Max. Transient Thermal Impedance

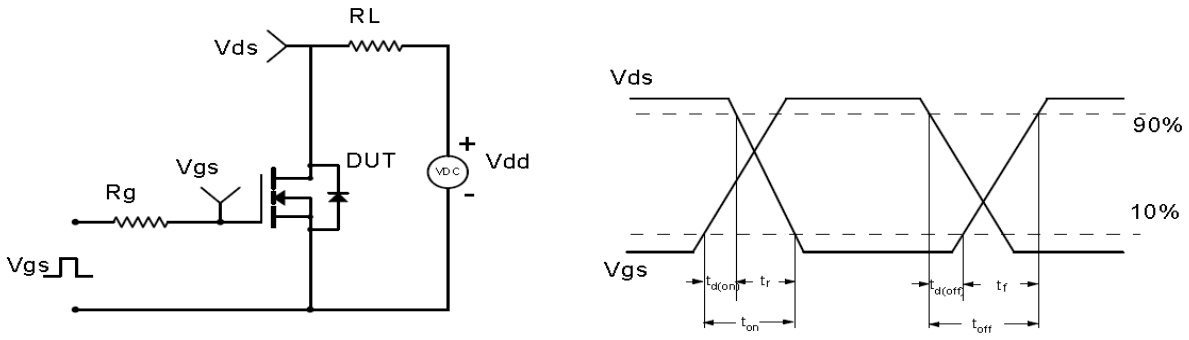


Test Circuit & Waveform

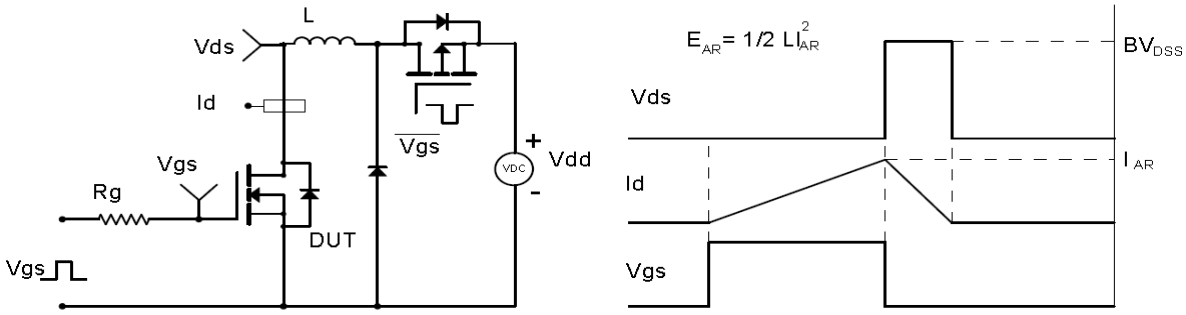
Gate Charge Test Circuit & Waveform



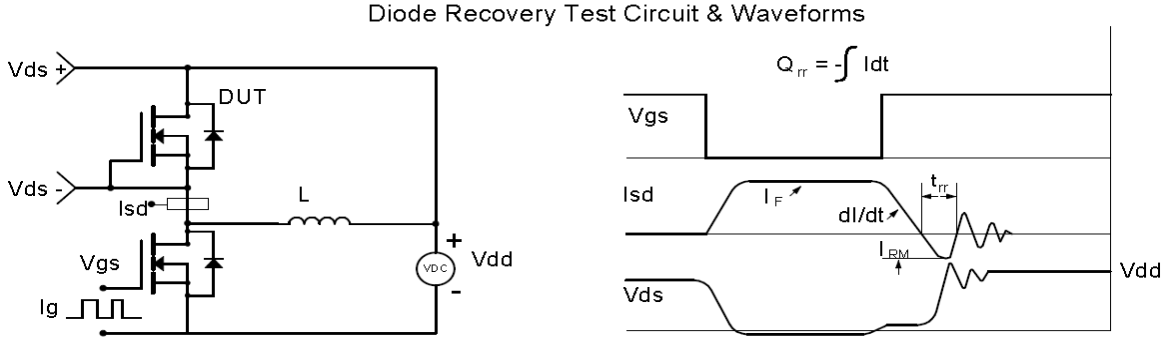
Resistive Switching Test Circuit & Waveforms



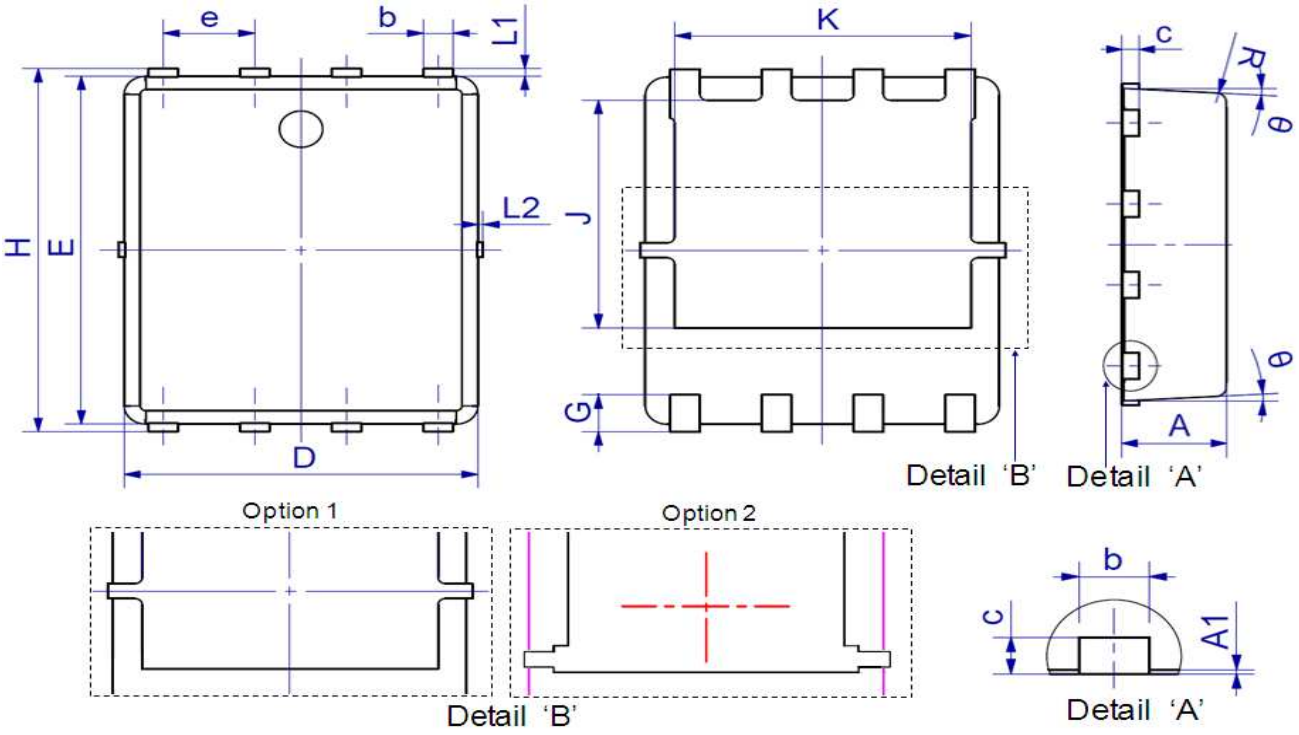
Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



Package Outline: PDFN5*6



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°

Marking

NOTE:
XBBAAAAY
X —Assembly location code
BB —Fab code
AAAA —Lot code
Y —Bin code

Revision History

Revison	Date	Major changes
1.0	2020-8-13	Release of formal version
2.0	2021-11-11	Add dv/dt items

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.