

Features

- Uses CRM(CQ) advanced SkyMOS4 technology
- Extremely low on-resistance $R_{DS(on)}$
- Excellent $Q_g \times R_{DS(on)}$ product(FOM)
- Qualified according to JEDEC criteria

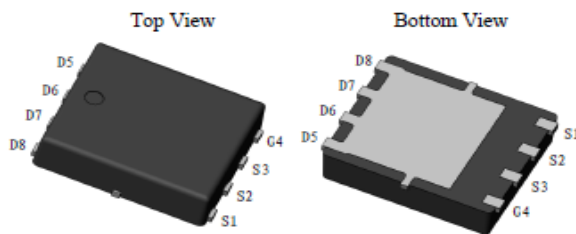
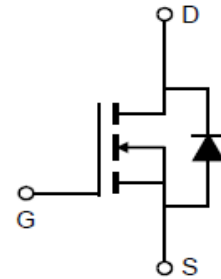
Product Summary

V_{DS}	60V
$R_{DS(on).typ}$	1.1mΩ
I_D	260A

Applications

- Motor control and drive
- Battery management System
- UPS (Uninterruptible Power Supplies)

100% DVDS Tested
100% Avalanche Tested


CRSM013N06N4Z

Package Marking and Ordering Information

Part #	Marking	Package	Packing	Reel Size	Tape Width	Qty
CRSM013N06N4Z	013N06N4Z	DFN5*6	Tape	N/A	N/A	5000pcs

Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Drain-source voltage	V_{DS}	60	V
Continuous drain current $T_C = 25^\circ\text{C}$ (Silicon limit) $T_C = 100^\circ\text{C}$ (Silicon limit)	I_D	260 163	A
Pulsed drain current ($T_C = 25^\circ\text{C}$, t_p limited by T_{jmax})	$I_{D\ pulse}$	1040	A
Avalanche energy, single pulse ($I_D = 62\text{A}$, $R_g = 25\Omega$) ^[1]	E_{AS}	961	mJ
Gate-Source voltage	V_{GS}	±20	V
Power dissipation ($T_C = 25^\circ\text{C}$)	P_{tot}	139	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)	T_{sold}	260	°C

※. Notes:

1.EAS is tested at starting $T_j = 25^\circ\text{C}$, $L = 0.5\text{mH}$, $I_{AS} = 62\text{A}$, $V_{GS} = 10\text{V}$.

2.Repetitive rating, pulse width limited by junction temperature $T_j(\text{MAX}) = 150^\circ\text{C}$. Ratings are based on low frequency and duty cycles to keep initial $T_j = 25^\circ\text{C}$.

Thermal Resistance

Parameter	Symbol	Max	Unit
Thermal resistance, junction – case.	R_{thJC}	0.90	°C/W
Thermal resistance, junction – ambient(min. footprint)	R_{thJA}	56	

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

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

Static Characteristic

Drain-source breakdown voltage	BV_{DSS}	60	-	-	V	$V_{GS}=0V, I_D=250\mu A$
Gate threshold voltage	$V_{GS(th)}$	2.2	3.0	3.8	V	$V_{DS}=V_{GS}, I_D=250\mu A$
Zero gate voltage drain current	I_{DSS}	-	-	1	μA	$V_{DS}=100V, V_{GS}=0V$ $T_j=25^\circ C$ $T_j=125^\circ C$
Gate-source leakage current	I_{GSS}	0	-	± 100	nA	$V_{GS}=\pm 20V, V_{DS}=0V$
Drain-source on-state resistance	$R_{DS(on)}$	-	1.1	1.39		$V_{GS}=10V, I_D=50A$
Transconductance	g_{fs}	-	180.4	-	S	$V_{DS}=5V, I_D=50A$

Dynamic Characteristic

Input Capacitance	C_{iss}	3645	7291	10936	pF	$V_{GS}=0V, V_{DS}=30V,$ $f=1MHz$
Output Capacitance	C_{oss}	982	1964	2946		
Reverse Transfer Capacitance	C_{rss}	27	55	110		
Gate Total Charge	Q_G	51	102.6	153	nC	$V_{GS}=10V, V_{DS}=30V,$ $I_D=50A$
Gate-Source charge	Q_{gs}	20	41.6	62		
Gate-Drain charge	Q_{gd}	6	12.8	25		
Turn-on delay time	$t_{d(on)}$	14	28.2	56	ns	$V_{GS}=10V, V_{DD}=30V,$ $R_{G_ext}=2.7\Omega, I_D=50A$
Rise time	t_r	23	46.9	70		
Turn-off delay time	$t_{d(off)}$	26	52.6	78		
Fall time	t_f	15	30.4	45		
Gate resistance	R_G	-	0.8	4	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}	-	0.83	1.4	V	$V_{GS}=0V, I_{SD}=50A$
Body Diode Reverse Recovery Time	t_{rr}	-	73.4	-	ns	$I_F=50A,$ $dI/dt=100A/\mu s$
Body Diode Reverse Recovery Charge	Q_{rr}	-	107.9	-	nC	

Typical Performance Characteristics

Fig 1: Output Characteristics

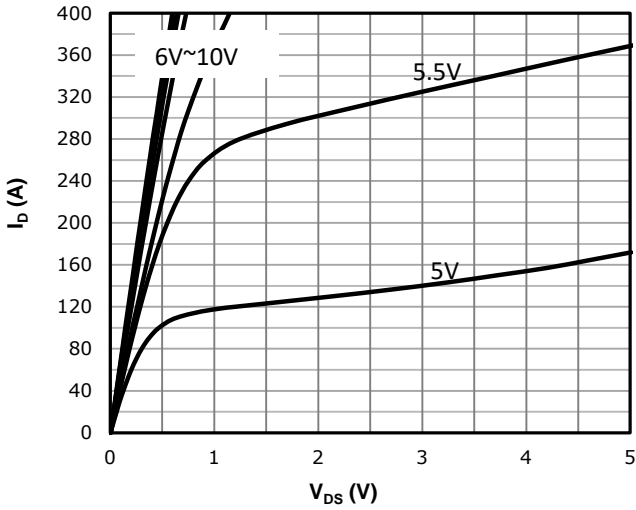


Fig 2: Transfer Characteristics

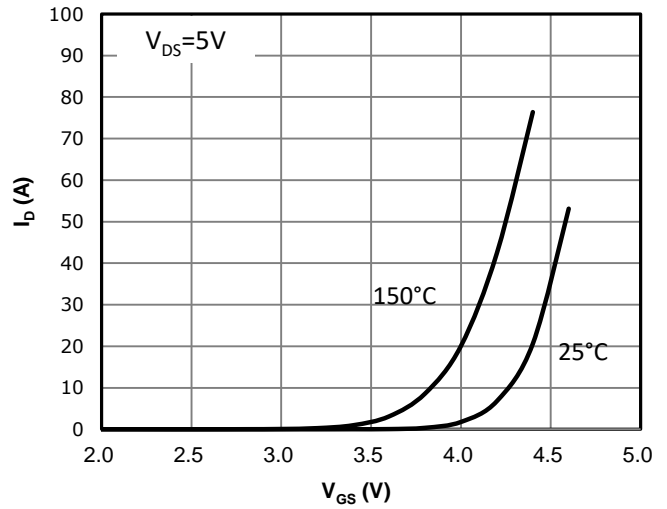


Fig 3: $R_{DS(on)}$ vs Drain Current and Gate Voltage

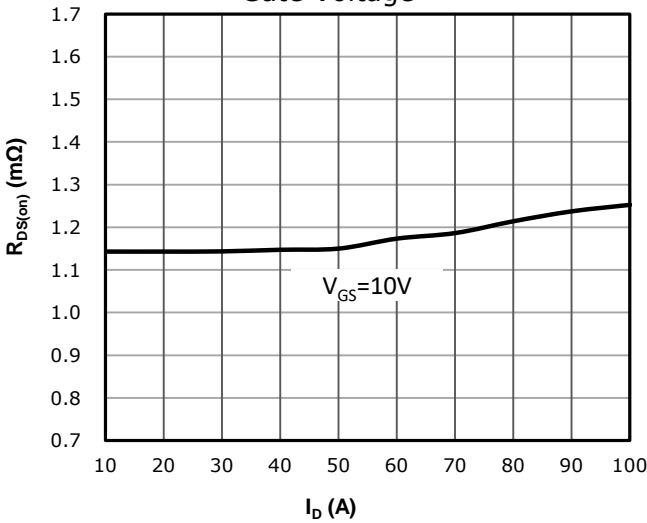


Fig 4: $R_{DS(on)}$ vs Gate Voltage

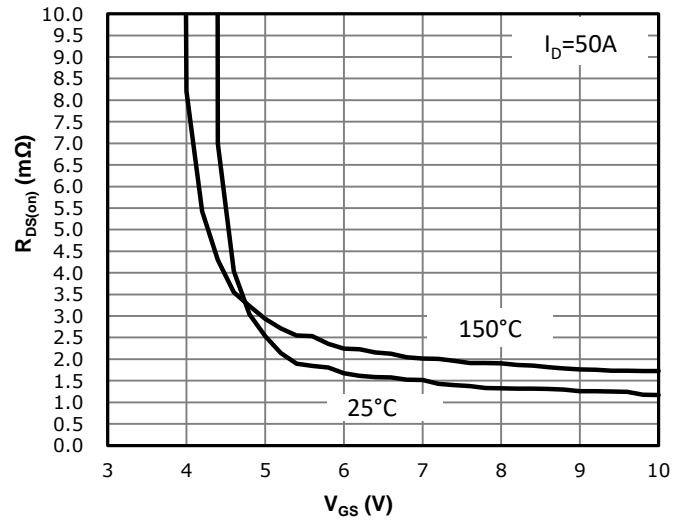


Fig 5: $R_{DS(on)}$ vs. Temperature

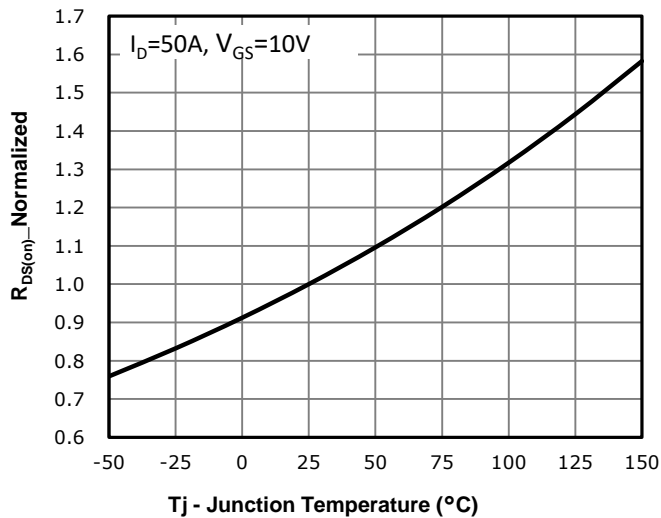


Fig 6: $V_{GS(th)}$ vs. Temperature

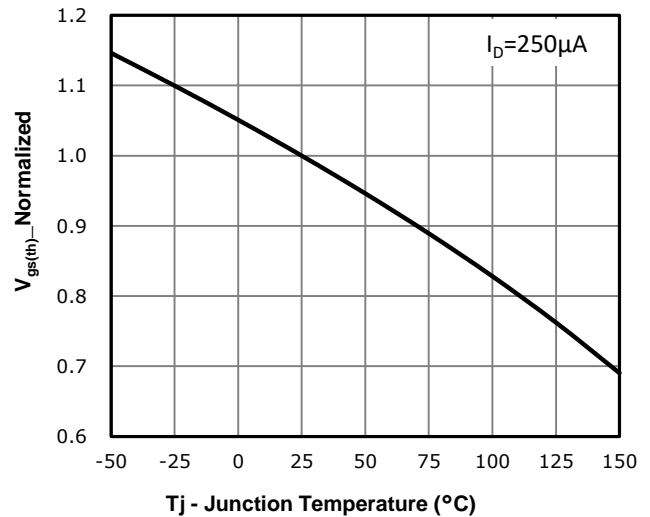


Fig 7: BVdss vs. Temperature

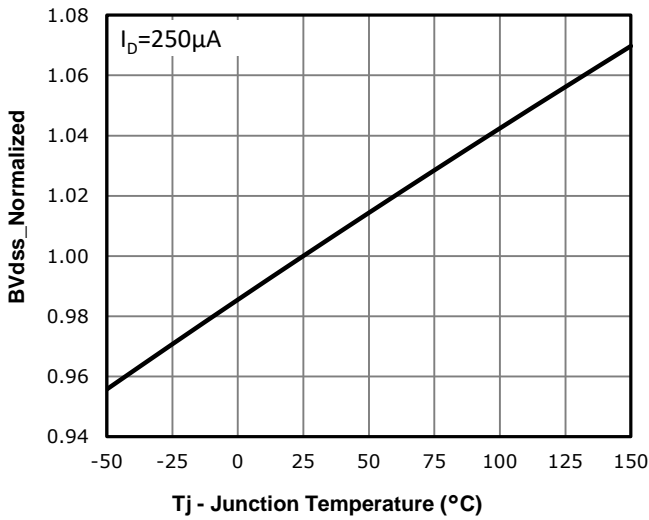


Fig 8: Capacitance Characteristics

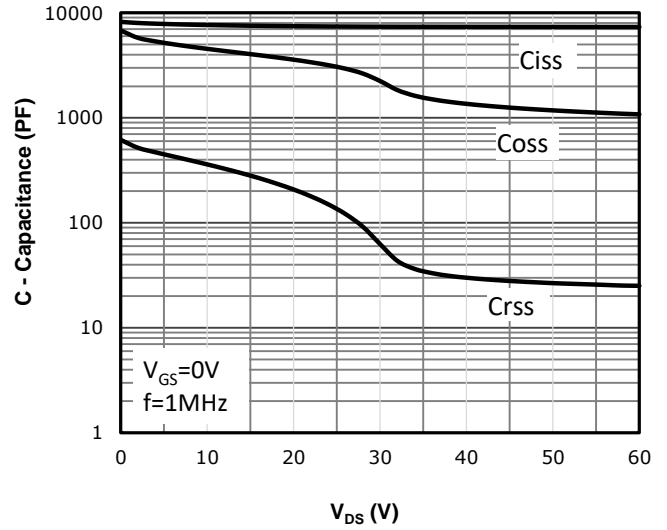


Fig 9: Gate Charge Characteristics

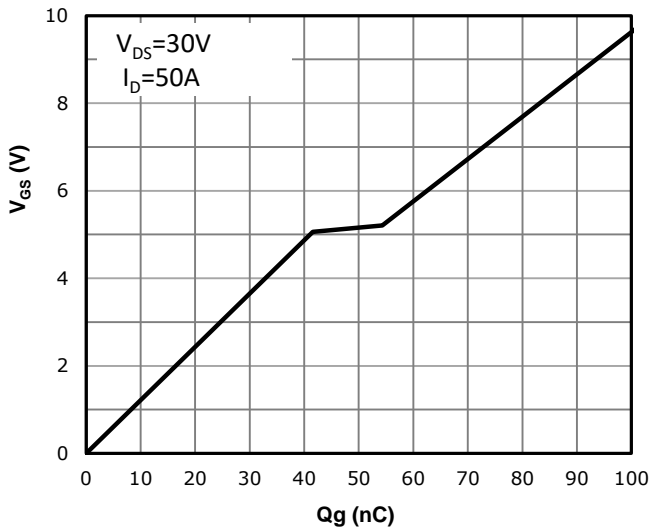


Fig 10: Body-diode Forward Characteristics

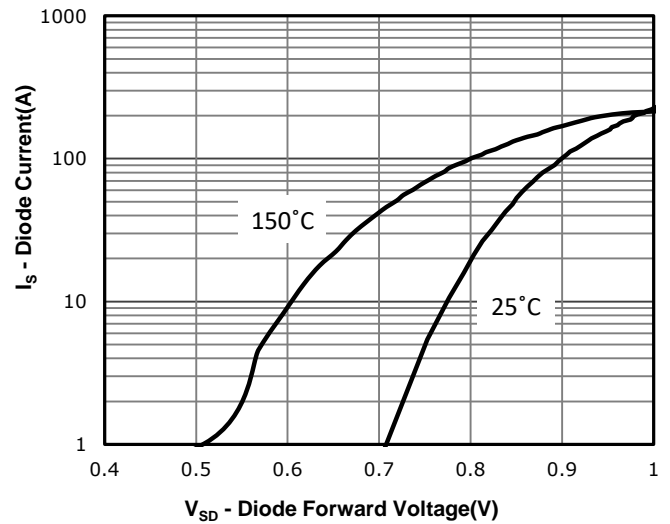


Fig 11: Power Dissipation

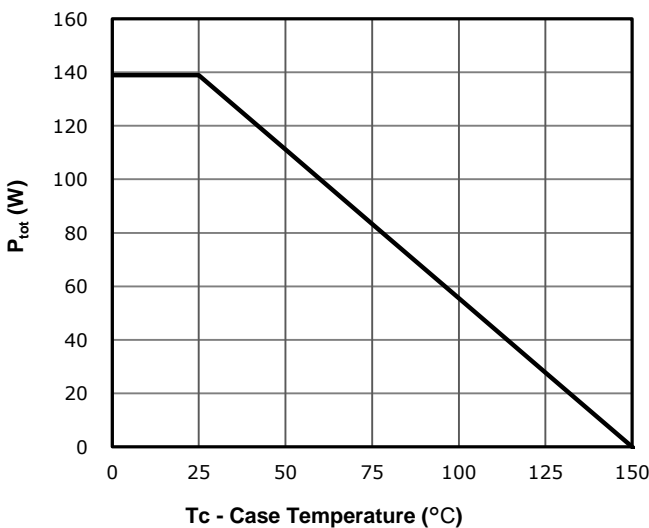


Fig 12: Drain Current Derating

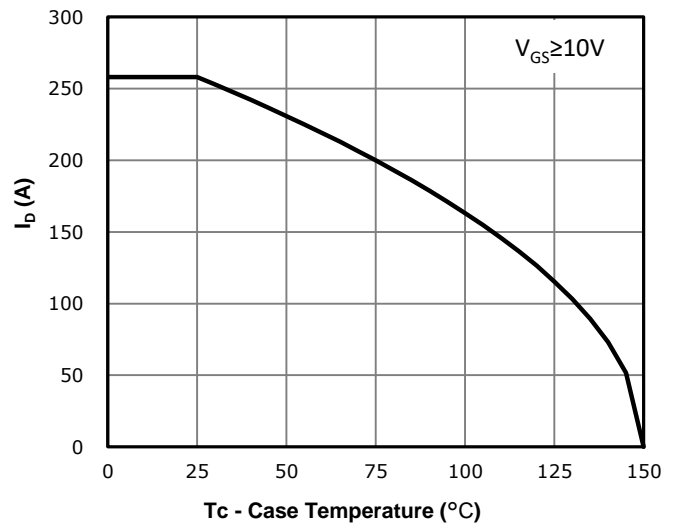


Fig 13: Safe Operating Area

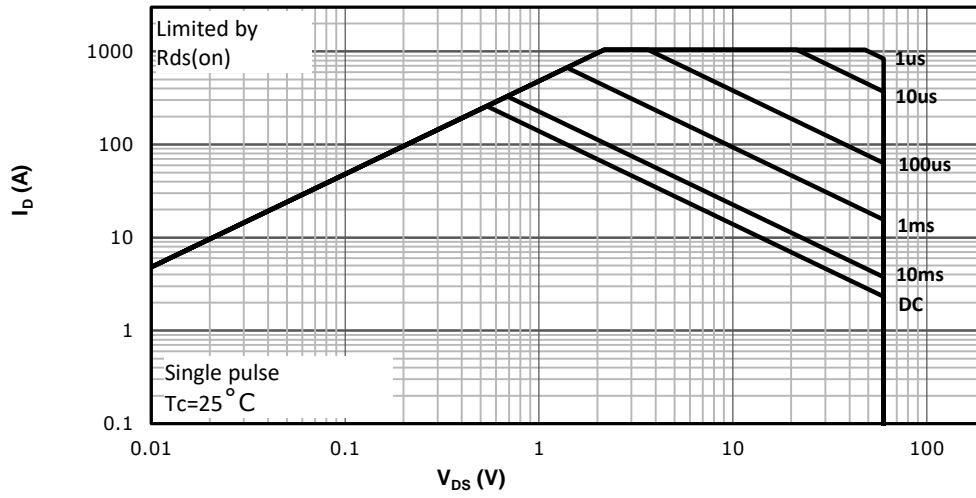
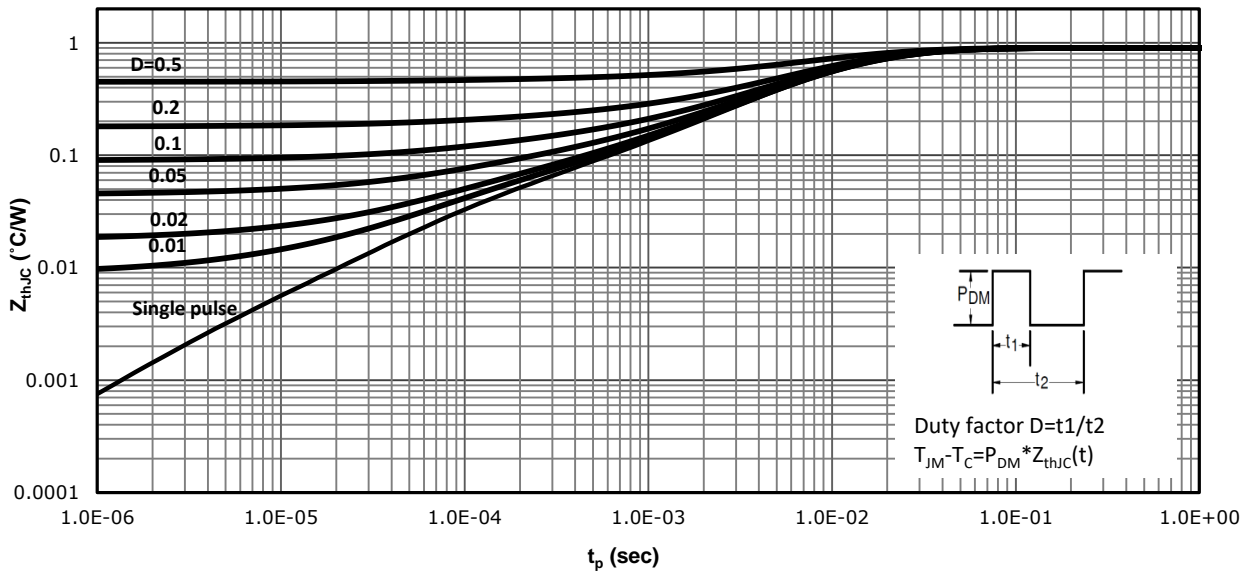
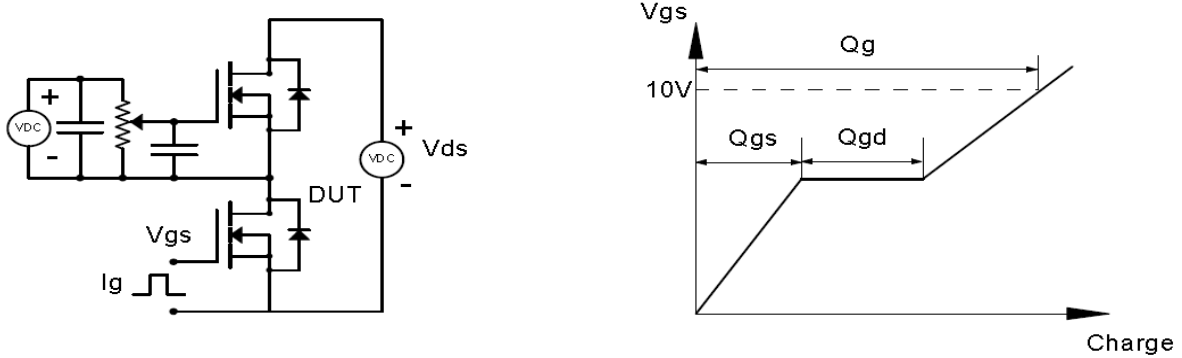


Fig 14: Max. Transient Thermal Impedance

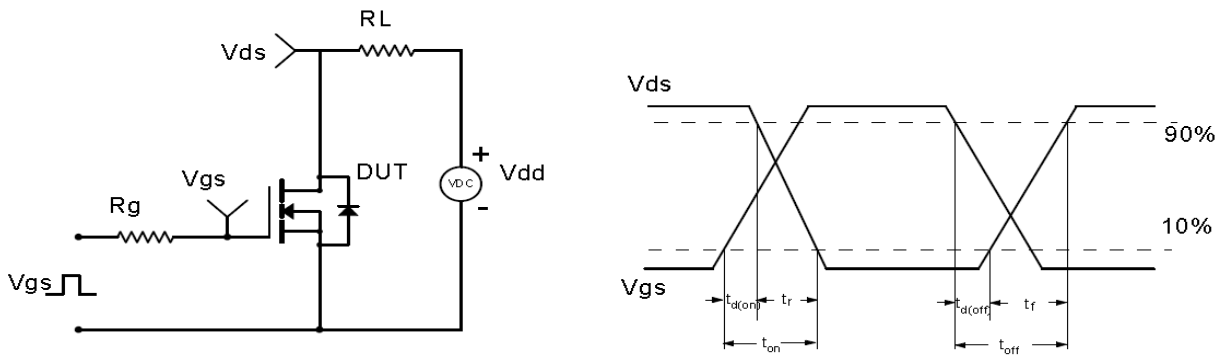


Test Circuit & Waveform

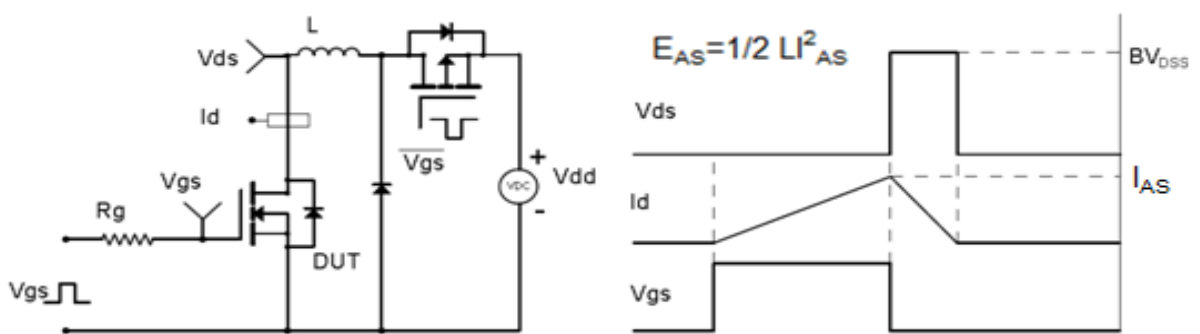
Gate Charge Test Circuit & Waveform



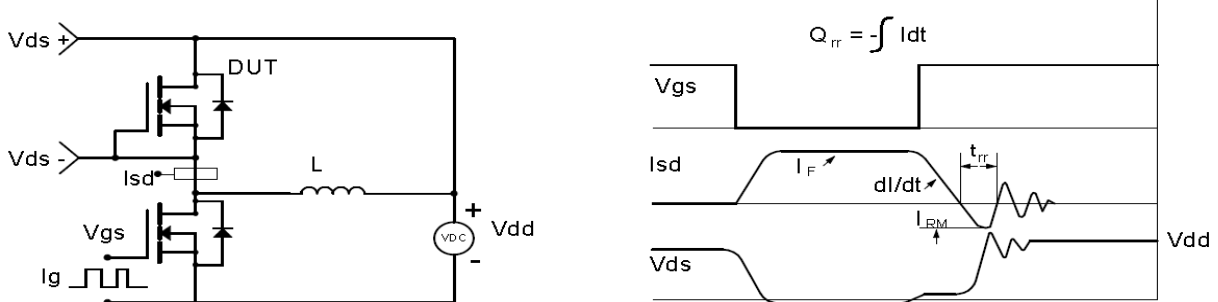
Resistive Switching Test Circuit & Waveforms

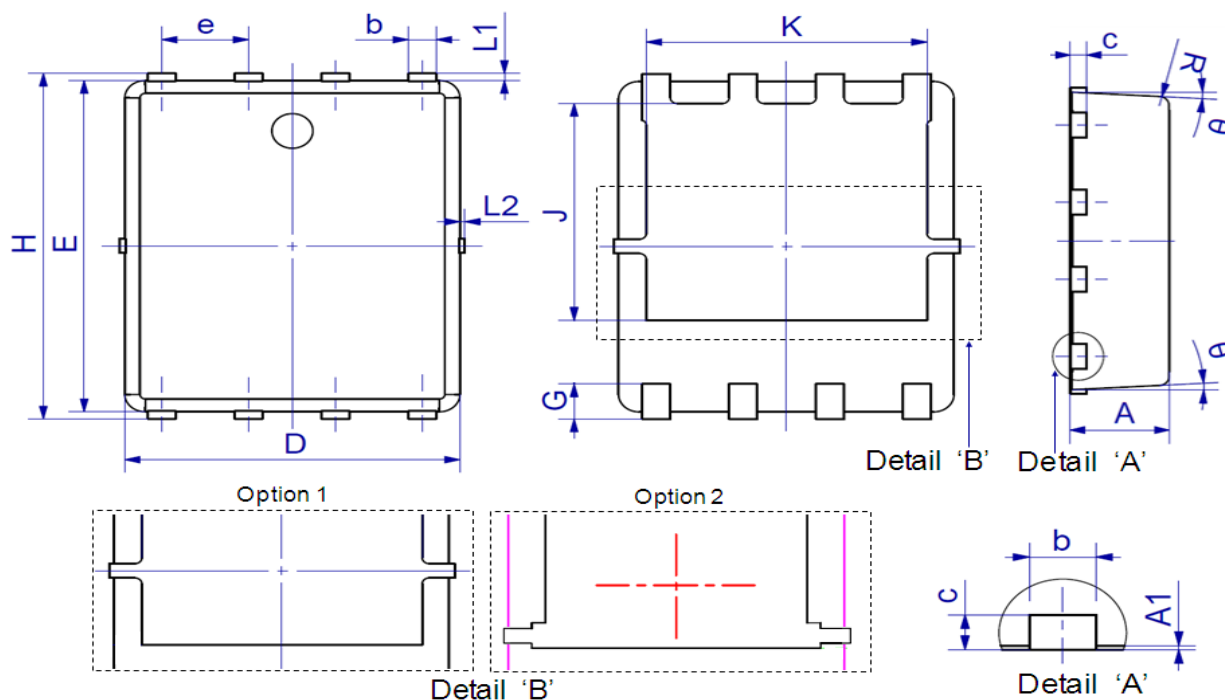


Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



Package Outline: DFN5X6 Cu Clip


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:

NXBBAAAAY

N —Wire Bond code

X —Assembly location code

BB —Fab code

AAAA —Lot code

Y —Bin code

Revision History

Revision	Date	Major changes
1.0	2024/3/10	Release of Preliminary version.

Disclaimer

Unless otherwise specified in the datasheet, the product is designed and qualified 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 semiconductor 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.

单击下面可查看定价，库存，交付和生命周期等信息

[>>CRMICRO\(华润微\)](#)