

Features

- Uses CRM(CQ) advanced SkyMOS2 technology
- Extremely low on-resistance $R_{DS(on)}$
- Excellent $Q_g \times R_{DS(on)}$ product(FOM)
- Qualified according to AEC-Q101 standard

Applications

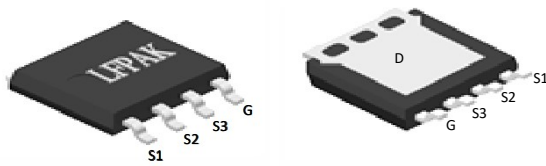
- Motor control and drive
- UPS (Uninterruptible Power Supplies)

Product Summary

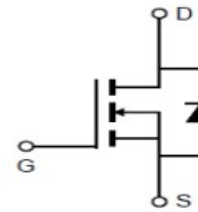
V_{DS}	100V
$R_{DS(on)}@10V$ typ	6.5mΩ
I_D	80A

100% DVDS Tested

100% Avalanche Tested



CRSY140N10L2Q



Package Marking and Ordering Information

Part #	Marking	Package	Packing	Reel Size	Tape Width	Qty
CRSY140N10L2Q	140N10L2Q	LFPAK5x6	Tape&reel	N/A	N/A	4000pcs

Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Drain-source voltage	V_{DS}	100	V
Continuous drain current $T_C = 25^\circ\text{C}$ (Silicon limit) $T_C = 100^\circ\text{C}$ (Silicon limit)	I_D	80 56	A
Pulsed drain current ($T_C = 25^\circ\text{C}$, t_p limited by T_{jmax})	$I_{D \text{ pulse}}$	316	A
Avalanche energy, single pulse ($I_{AS} = 30\text{A}$, $R_g = 25\Omega$) ^[1]	E_{AS}	135	mJ
Gate-Source voltage	V_{GS}	± 20	V
Power dissipation ($T_C = 25^\circ\text{C}$)	P_{tot}	97	W
Operating junction and storage temperature	T_j, T_{stg}	-55...+175	$^\circ\text{C}$
Soldering temperature, wave soldering only allowed at leads (1.6mm from case for 10s)	T_{sold}	260	$^\circ\text{C}$

Notes:1.EAS was tested at $T_j = 25^\circ\text{C}$, $L = 0.3\text{mH}$, $I_{AS} = 30\text{A}$, $V_{gs} = 10\text{V}$.

Thermal Resistance

Parameter	Symbol	Value		Unit
		min.	Max	
Thermal resistance, junction – case.	R_{thJC}	-	1.55	$^\circ\text{C/W}$
Thermal resistance, junction – ambient(min. footprint)	R_{thJA}	-	56	
Thermal resistance, junction – plastic case	R_{thj-pc}	-	21	

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

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		
Static Characteristic						
Drain-source breakdown voltage	BV _{DSS}	100	-		V	V _{GS} =0V, I _D =250uA
Gate threshold voltage	V _{GS(th)}	1.2	-	2.2	V	V _{DS} =V _{GS} ,I _D =250uA
Zero gate voltage drain current	I _{DSS}	-	-	1	μA	V _{DS} =100V,V _{GS} =0V T _j =25°C
		-	-	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)}	1	6.5	8.2	mΩ	V _{GS} =10V, I _D =40A
		1	8.5	10.0		V _{GS} =4.5V, I _D =32A
Transconductance	g _{fs}	102	105	210	S	V _{DS} =5V,I _D =40A

Dynamic Characteristic

Input Capacitance	C_{iss}	1600	2260	4100	pF	$V_{GS}=0V, V_{DS}=50V, f=1\text{MHz}$
Output Capacitance	C_{oss}	80	400	2000		
Reverse Transfer Capacitance	C_{rss}	2	15	90		
Gate Total Charge	Q_G	20	40	80	nC	$V_{GS}=10V, V_{DS}=50V, I_D=40A, f=1\text{MHz}$
Gate-Source charge	Q_{gs}	5	10	25		
Gate-Drain charge	Q_{gd}	3	6	12		
Turn-on delay time	$t_{d(on)}$	6	12.5	25	ns	$V_{GS}=10V, V_{DD}=50V, R_{G_{ext}}=3.0\Omega$
Rise time	t_r	20	40	120		
Turn-off delay time	$t_{d(off)}$	16	32	64		
Fall time	t_f	45	90	180		
Gate resistance	R_G	0.3	1.5	3	Ω	$V_{GS}=0V, V_{DS}=0V, f=1\text{MHz}$

Body Diode Characteristic

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		
Diode continuous forward current	I_S	-	-	80	A	$T_c = 25^\circ\text{C}$
Diode pulse current	I_S pulse	-	-	320	A	$T_c = 25^\circ\text{C}$
Body Diode Forward Voltage	V_{SD}	0.4	0.9	1.4	V	$V_{GS}=0V, I_{SD}=40A$
Body Diode Reverse Recovery Time	t_{rr}	52	105	210	ns	$I_F=40A, dI/dt=100A/\mu s$
Body Diode Reverse Recovery Charge	Q_{rr}	85	170	340	nC	

Typical Performance Characteristics

Fig 1: Output Characteristics

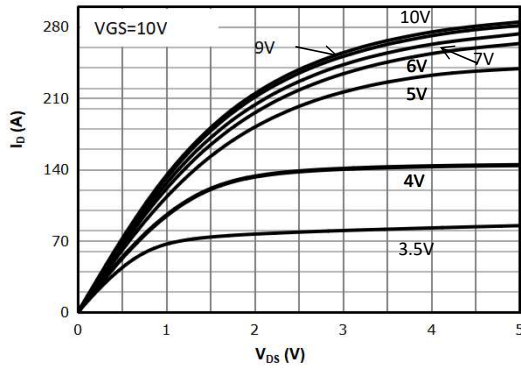


Fig 2: Transfer Characteristics

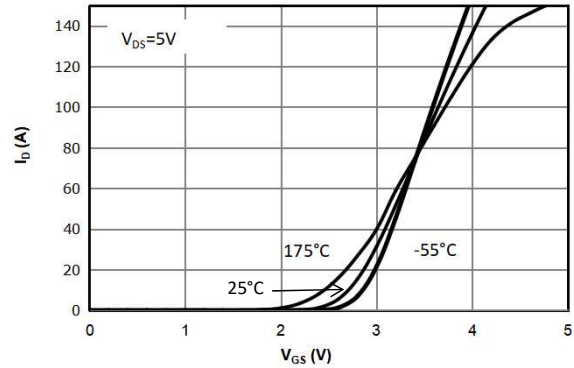


Fig 3: Rds(on) vs Drain Current and Gate Voltage

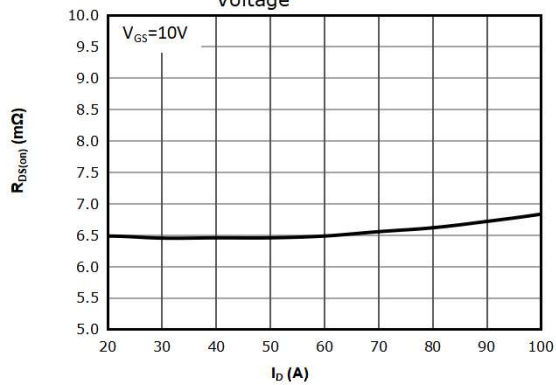


Fig 4: Rds(on) vs Gate Voltage

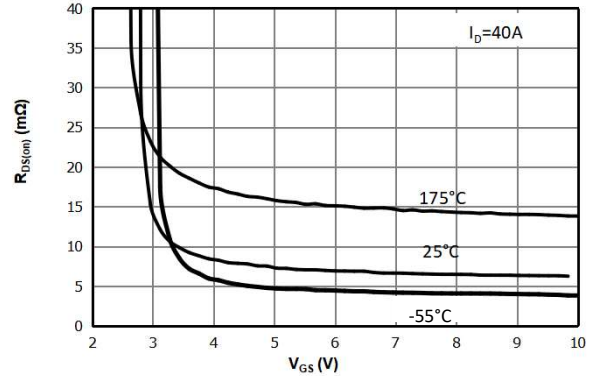


Fig 5: Rds(on) vs. Temperature

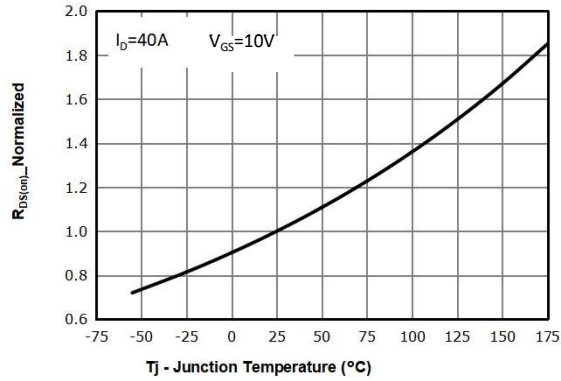


Fig 6: Vgs(th) vs. Temperature

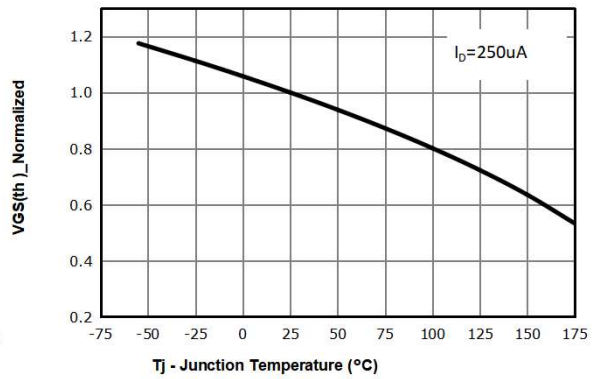


Fig 7: BVds vs. Temperature

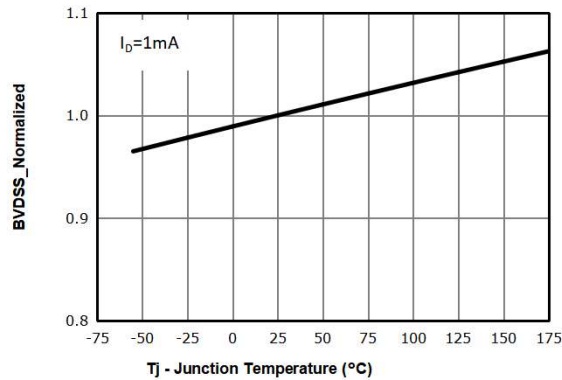


Fig 8: Capacitance Characteristics

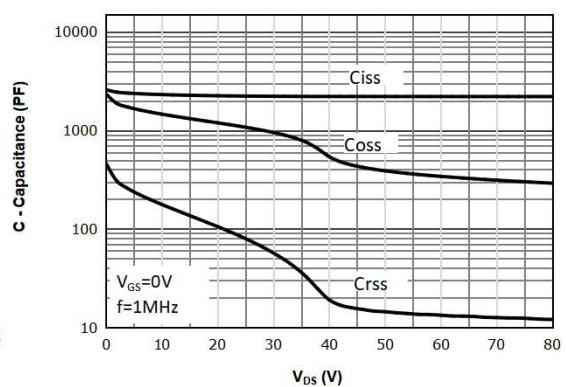


Fig 9: Gate Charge Characteristics

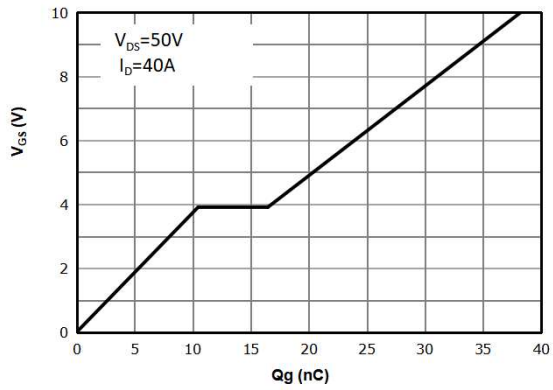


Fig 10: Body-diode Forward Characteristics

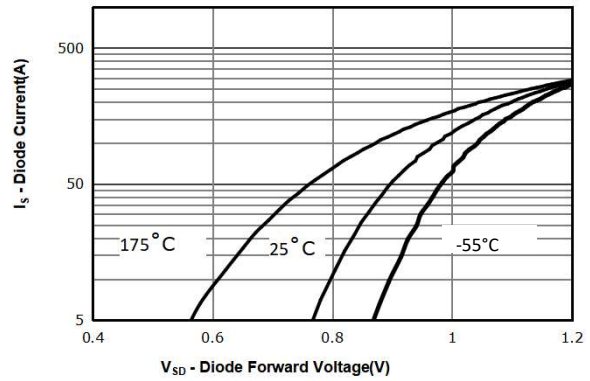


Fig 11: Power Dissipation

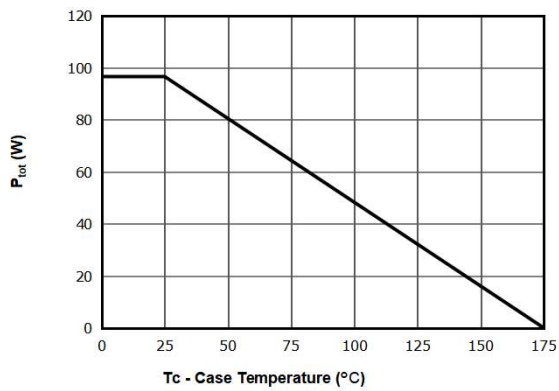


Fig 12: Drain Current Derating

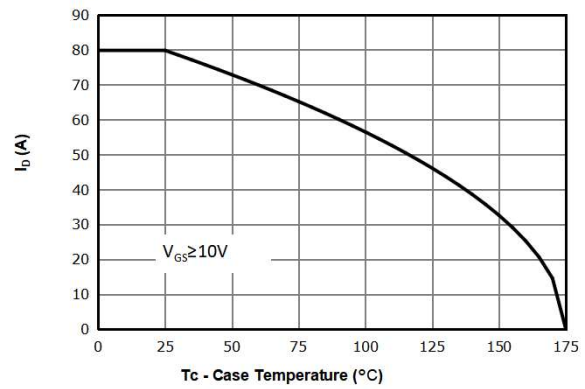


Fig 13: Safe Operating Area

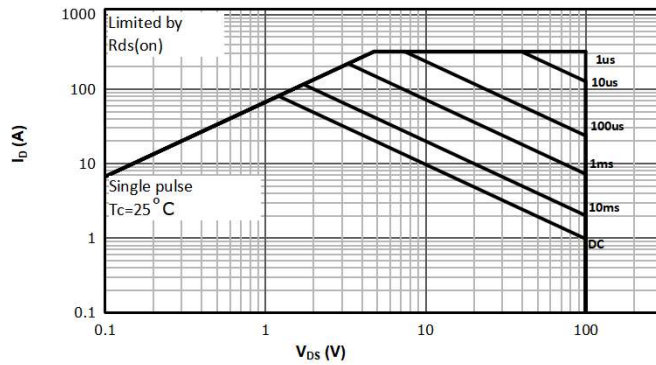
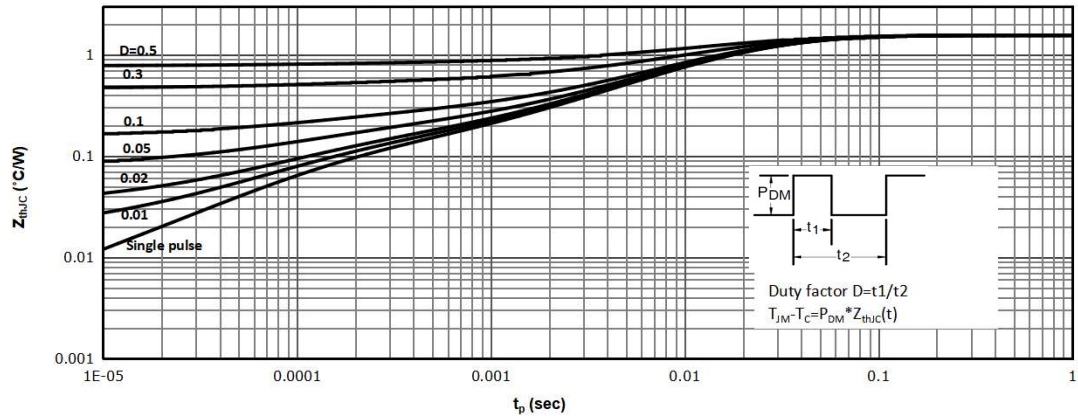
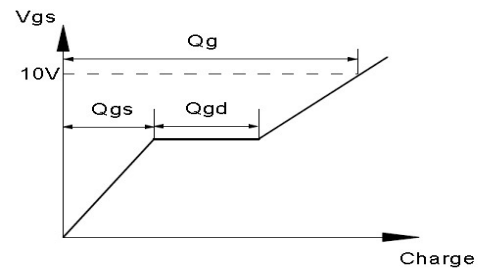
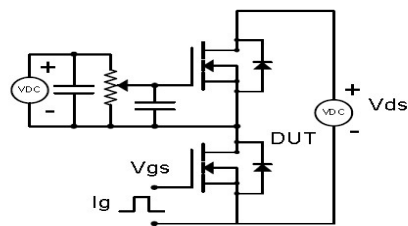


Fig 14: Max. Transient Thermal Impedance

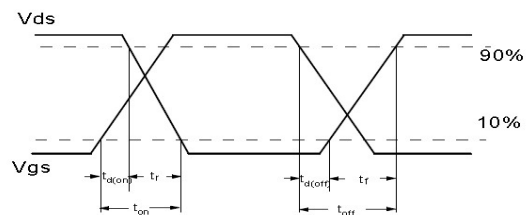
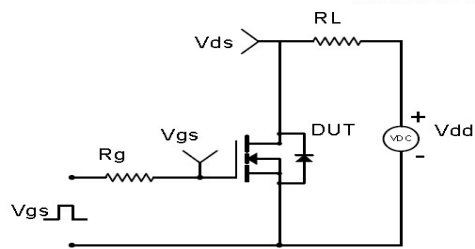


Test Circuit & Waveform

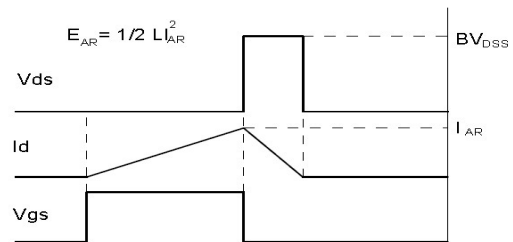
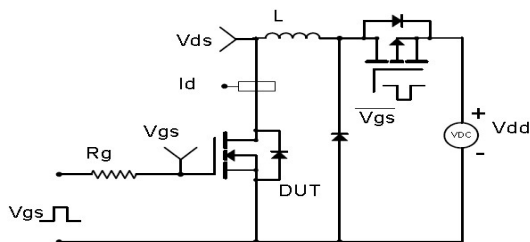
Gate Charge Test Circuit & Waveform



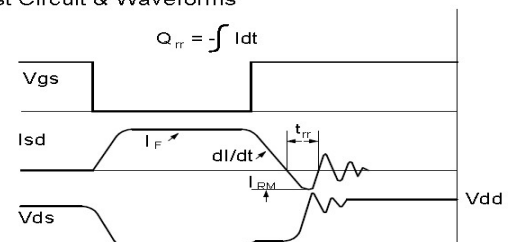
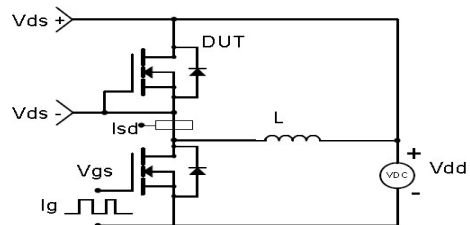
Resistive Switching Test Circuit & Waveforms



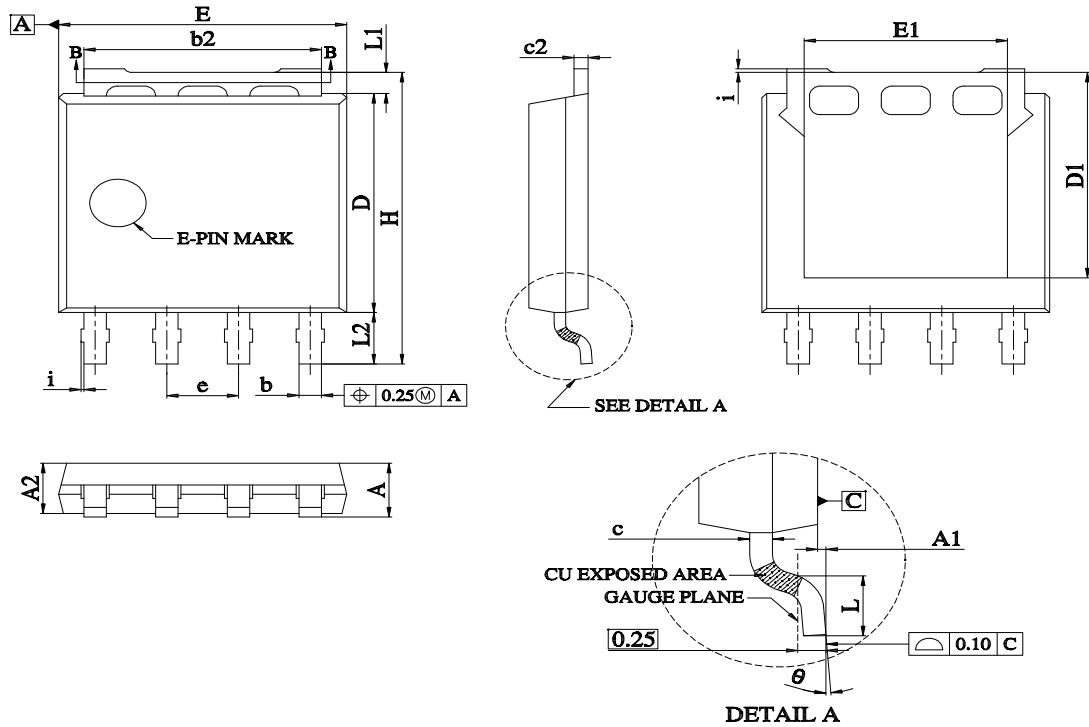
Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms

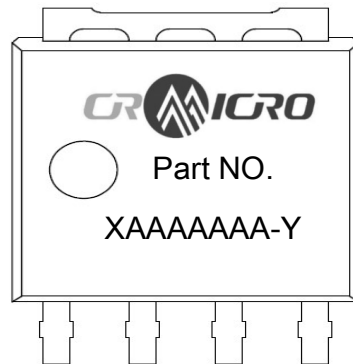


Package Outline: LFPAK5x6



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.00	1.20	0.039	0.047
A1	0.00	0.15	0.000	0.006
A2	0.95	1.15	0.037	0.045
b	0.32	0.50	0.013	0.020
b2	3.80	4.41	0.150	0.174
c	0.17	0.25	0.007	0.010
c2	0.22	0.30	0.009	0.012
D	4.45	4.70	0.175	0.185
D1	--	4.45	--	0.175
E	4.90	5.30	0.193	0.209
E1	3.45	3.75	0.136	0.148
e	1.27 BSC		0.050 BSC	
H	5.95	6.25	0.234	0.246
i	--	0.25	--	0.010
L	0.40	0.85	0.016	0.033
L1	0.27	0.57	0.011	0.022
L2	0.80	1.30	0.031	0.051
θ	0°	8°	0°	8°

Marking



NOTE:

XAAAAAAAA-Y

X — Assembly location code
 AAAAAAA — Assembly lot NO.last 7digits
 Y — Bin code

Reversion History

Reversion	Date	Major changes
1.0	2022/12/20	Release of preliminary 1.0 version.
2.0	2024/3/14	Change Rthj-pc Max,Add Is /Is pulse.
3.0	2026/4/28	Update application.

Disclaimer

CRM reserves the right to change any product or information in this Specification at any time without prior notice.

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