Features

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

Product Summary

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

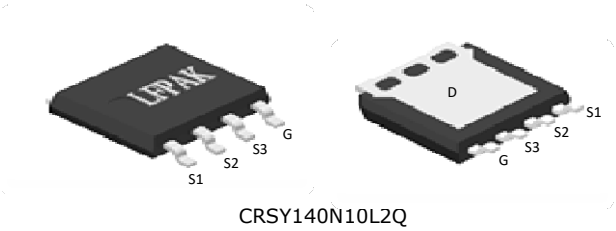
Applications

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

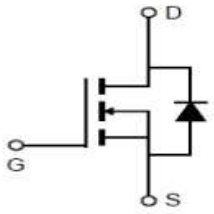
100% DVDS Tested

100% Avalanche Tested

RoHS H F



CRSY140N10L2Q



Package Marking and Ordering Information

Part #	Marking	Package	Packing	Reel Size	Tape Width	Qty
CRSY140N10L2Q	140N10L2Q	LFPAK5*6	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°C (Silicon limit) T_C = 100°C (Silicon limit)	I_D	 80 56	A
Pulsed drain current (T_C = 25°C, t_p limited by T_{jmax})	$I_{D\ pulse}$	316	A
Avalanche energy, single pulse (IAS = 30A, Rg=25Ω)[1]	E_{AS}	135	mJ
Gate-Source voltage	V_{GS}	±20	V
Power dissipation (T_C = 25°C)	P_{tot}	97	W
Operating junction and storage temperature	T_j , T_{stg}	-55...+175	°C
Soldering temperature, wave soldering only allowed at leads (1.6mm from case for 10s)	Tsold	260	°C

Notes:1.EAS was tested at Tj = 25℃, L = 0.3mH, IAS = 30A, Vgs=10V.

Thermal Resistance

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

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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}	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}	- -	- -	1 100	μA	V_{DS}=100V,V_{GS}=0V T_j=25°C 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 1	6.5 8.5	8.2 10.0	mΩ	V_{GS}=10V, I_D=40A 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=1MHz
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=1MHz
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}=3.0Ω
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=1MHz

Body Diode Characteristic

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		
Diode continous forward current	Is	-	-	80	A	Tc = 25°C
Diode pulse current	Is pulse	-	-	320	A	Tc = 25°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/μs
Body Diode Reverse Recovery Charge	Q_{rr}	85	170	340	nC	

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Typical Performance Characteristics

Fig 1: Output Characteristics

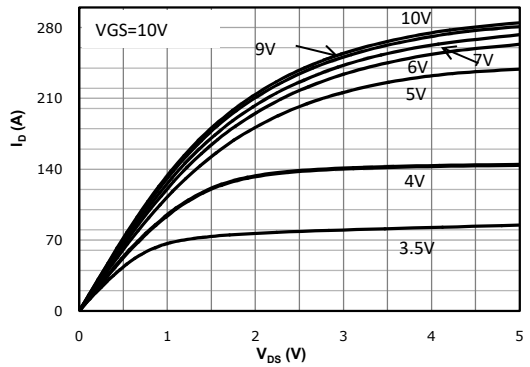


Fig 2: Transfer Characteristics

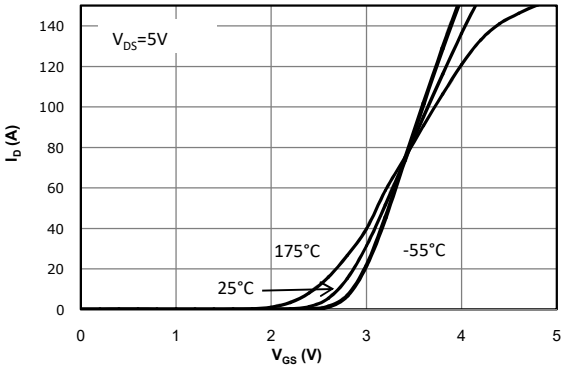


Fig 3: Rds(on) vs Drain Current and Gate Voltage

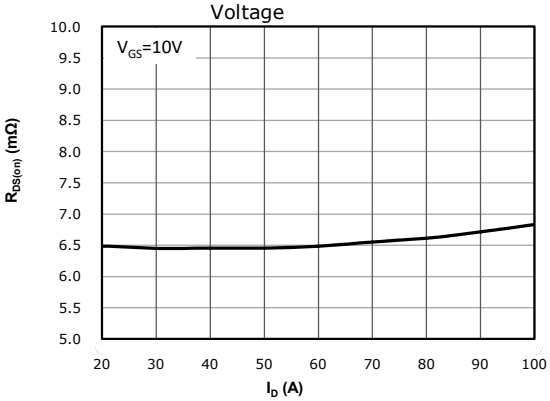


Fig 4: Rds(on) vs Gate Voltage

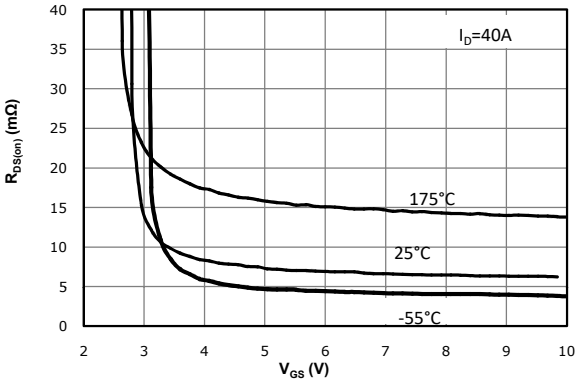


Fig 5: Rds(on) vs. Temperature

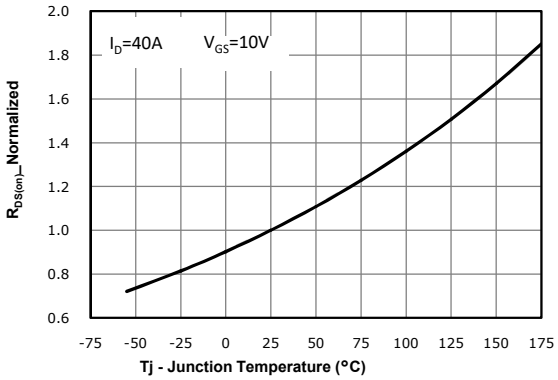


Fig 6: Vgs(th) vs. Temperature

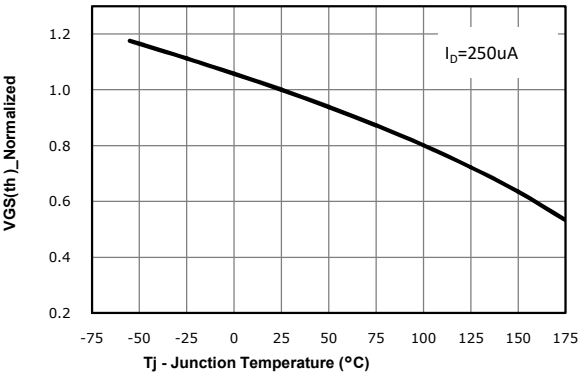


Fig 7: BVds vs. Temperature

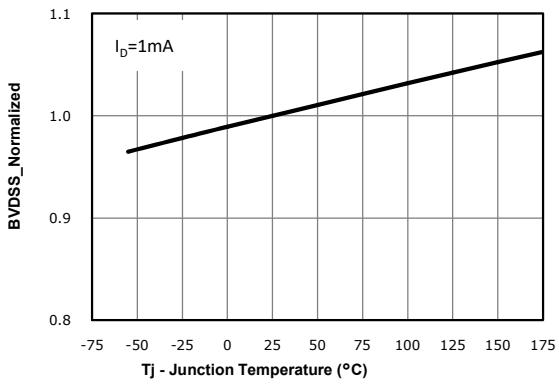
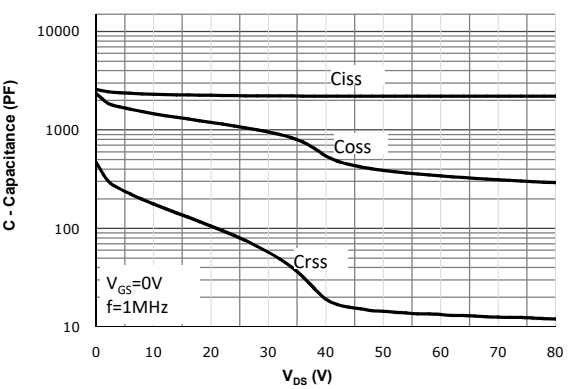


Fig 8: Capacitance Characteristics



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Fig 9: Gate Charge Characteristics

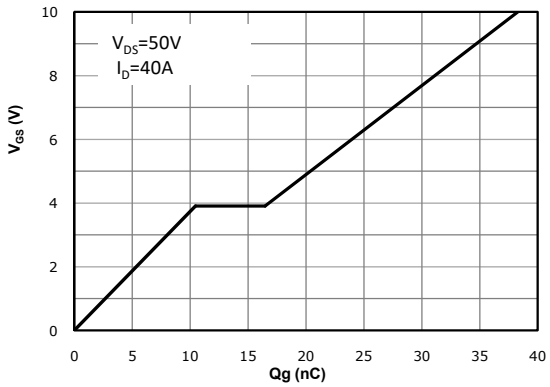


Fig 10: Body-diode Forward Characteristics

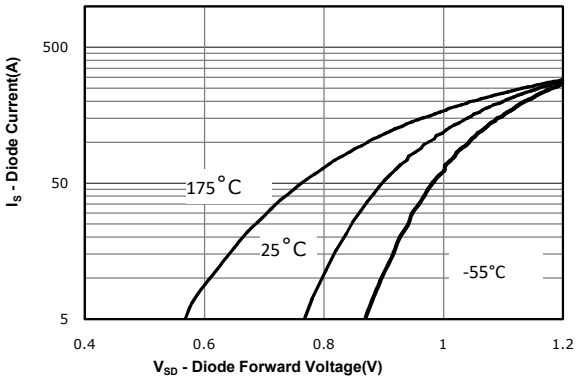


Fig 11: Power Dissipation

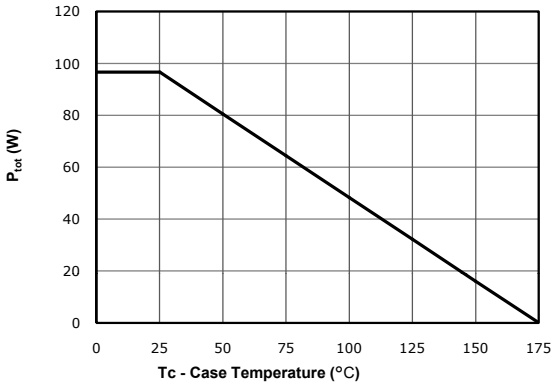


Fig 12: Drain Current Derating

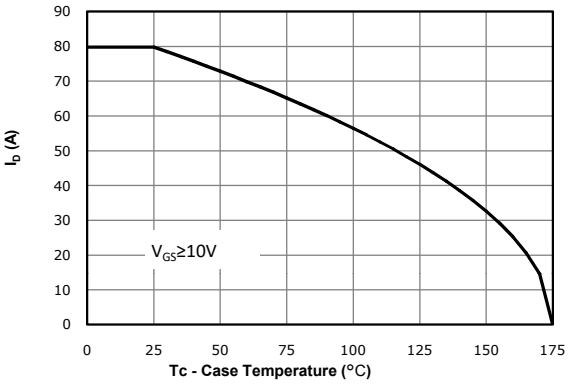


Fig 13: Safe Operating Area

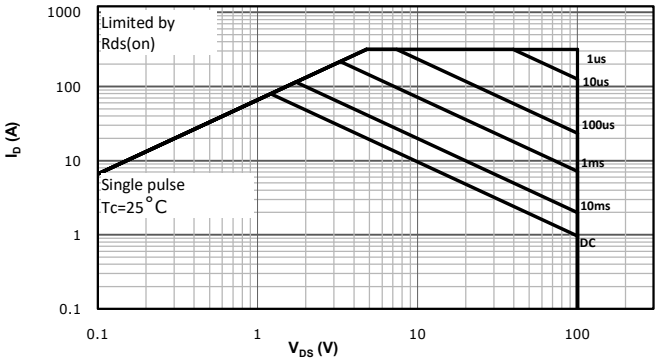
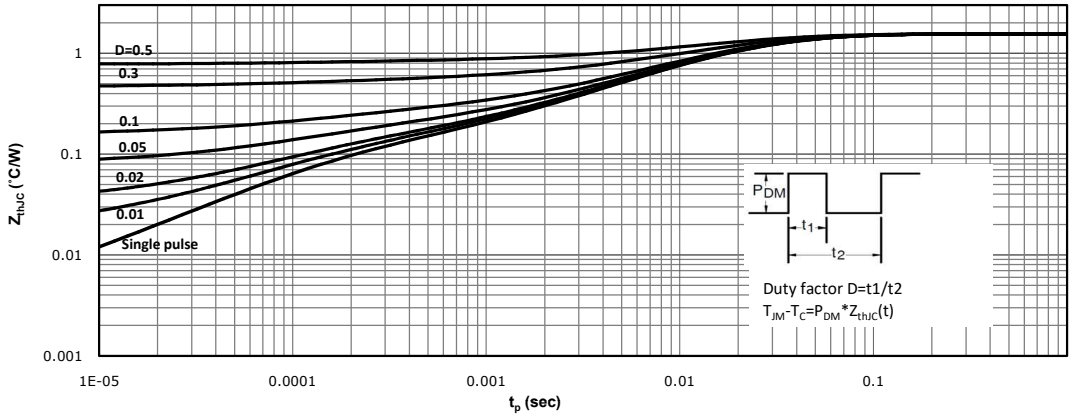


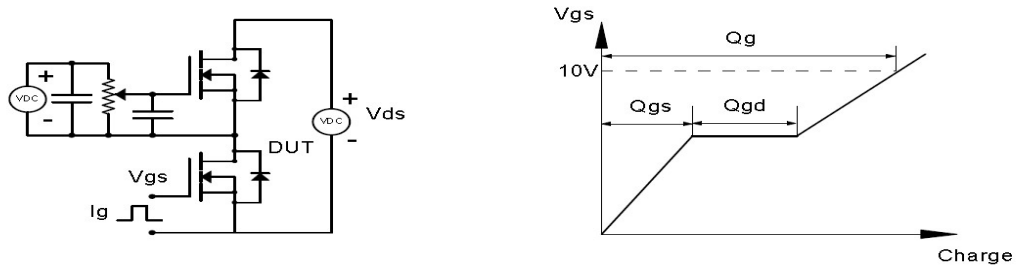
Fig 14: Max. Transient Thermal Impedance



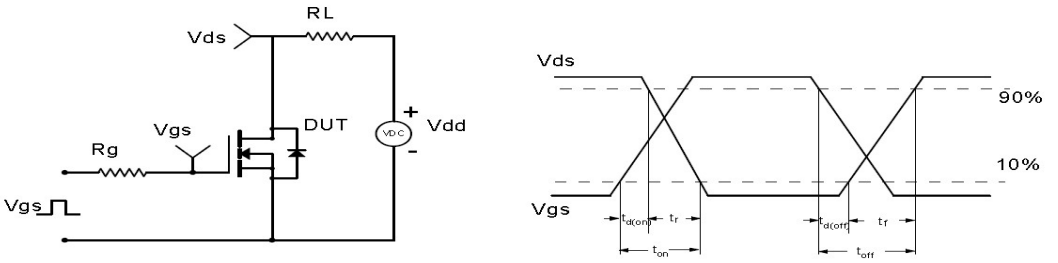
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Test Circuit & Waveform

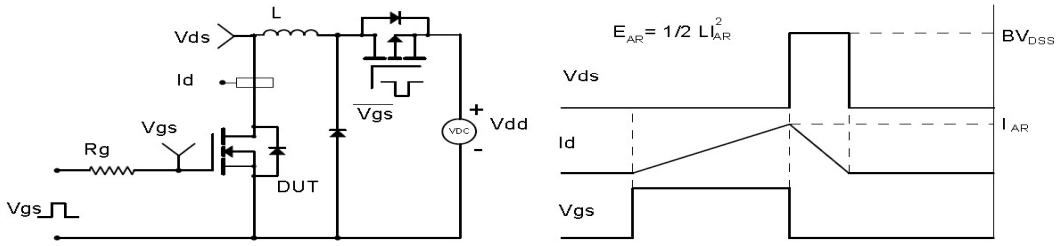
Gate Charge Test Circuit & Waveform



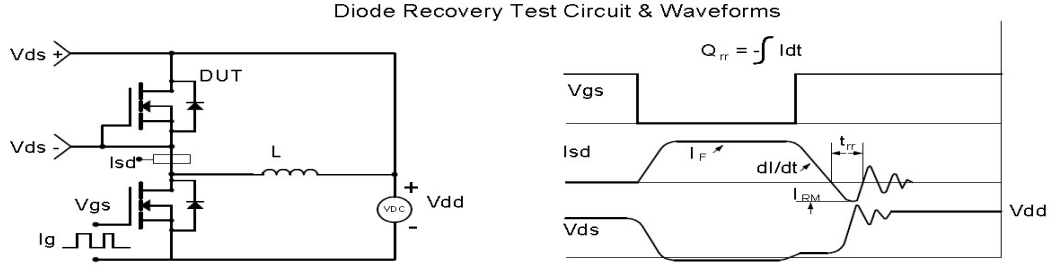
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms

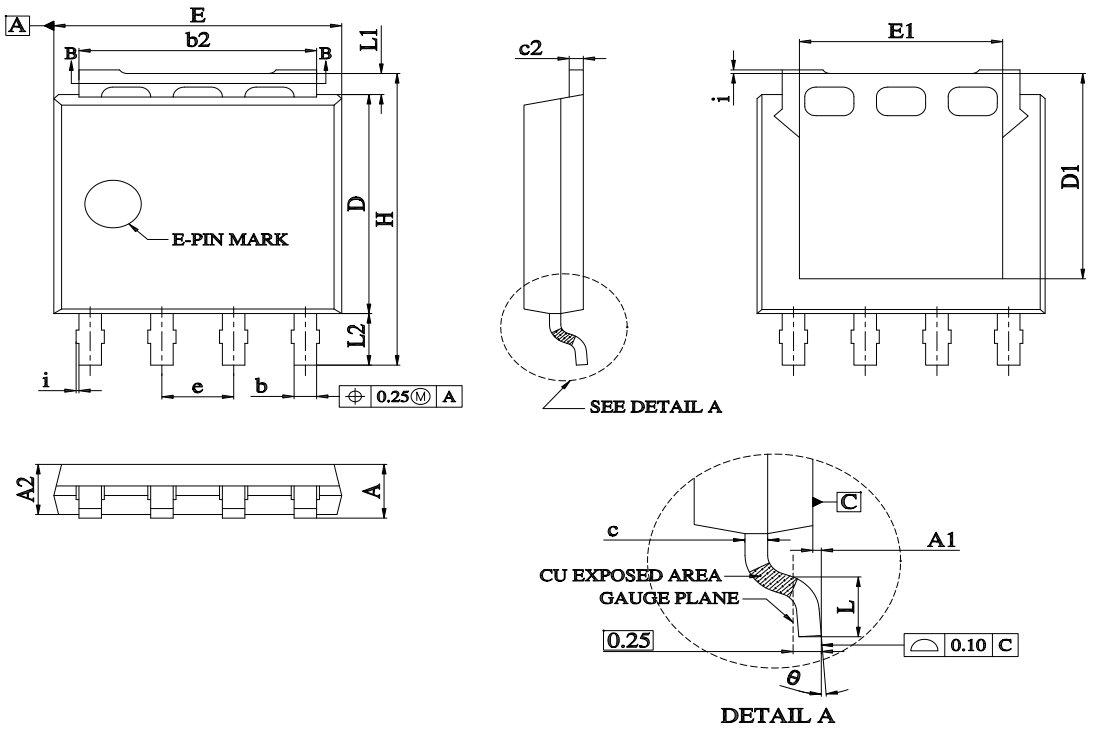


Diode Recovery Test Circuit & Waveforms



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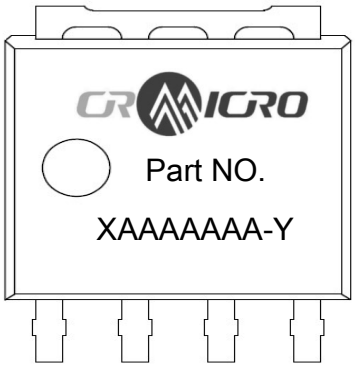
Package Outline: LFPAK5*6



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°

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Marking



NOTE:
XAAAAAAA-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.

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