Features

- Uses CRM(CQ) advanced Trench technology
- Extremely low on-resistance $R_{DS(on)}$
- Excellent Q_gx$R_{DS(on)}$ product(FOM)
- AEC-Q101 Qualified
- MSL1 up to 260°C peak reflow

Product Summary

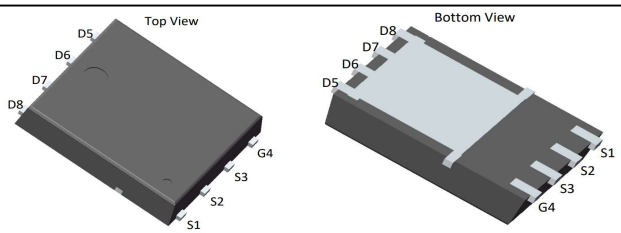
V_{DS}	-60V
$R_{DS(on)@10V\ typ}$	9mΩ
I_D	-67A

Applications

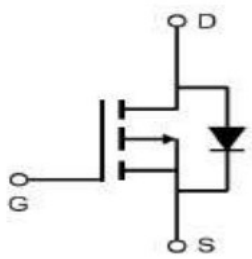
- Motor control and drive
- Battery management
- UPS (Uninterrupible Power Supplies)

100% DVDS Tested

100% Avalanche Tested



CRTM125P06LQ



Package Marking and Ordering Information

Part #	Marking	Package	Packing	Reel Size	Tape Width	Qty
CRTM125P06LQ	TM125P06LQ	PDFN5X6	Tape&reel	N/A	N/A	4000/5000pcs

Absolute Maximum Ratings

Parameter	**Symbol**	**Value**	**Unit**
Drain-source voltage	V_{DS}	-60	V
Continuous drain current T_C = 25°C (Silicon limit) T_C = 25°C (Package limit) T_C = 100°C (Silicon limit)	I_D	 -67 -80 -48	A
Pulsed drain current (T_C = 25°C, t_p limited by T_{jmax})	$I_{D\ pulse}$	-270	A
Avalanche energy, single pulse (ID=-35A, Rg=25Ω)[1]	E_{AS}	306	mJ
Gate-Source voltage	V_{GS}	±20	V
Power dissipation (T_C = 25°C)	P_{tot}	94	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 = 0.5mH, IAS = -35A, Vgs=-10V.

Thermal Resistance

Parameter	**Symbol**	**Max**	**Unit**
Thermal resistance, junction – case (junction-heat-spreader)	R_{thJC}	1.59	°C/W
Thermal resistance, junction – ambient(min. footprint)	R_{thJA}	52	

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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}	-60	-	-	V	V_{GS}=0V, I_D=-250uA
		-60	-	-	V	V_{GS}=0V, I_D=-1mA
Gate threshold voltage	$V_{GS(th)}$	-1	-	-2.5	V	V_{DS}=V_{GS},I_D=-250uA
Zero gate voltage drain current	I_{DSS}	-	-	-1	μA	V_{DS}=-60V,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	$R_{DS(on)}$	-	9	12.5	mΩ	V_{GS}=-10V, I_D=-30A
			11.8	24		V_{GS}=-4.5V, ID=-24A
Transconductance	g_{fs}	43.5	87	174	S	V_{DS}=-5V,I_D=-30A
Dynamic Characteristic						
Input Capacitance	C_{iss}	3491	6981	13962	pF	V_{GS}=0V, V_{DS}=-30V, f=1MHz
Output Capacitance	C_{oss}	82	408	2040		
Reverse Transfer Capacitance	C_{rss}	65	327	1635		
Gate Total Charge	Q_G	66	132	264	nC	V_{GS}=-10V, V_{DS}=-30V, I_D=-30A, f=1MHz
Gate-Source charge	Q_{gs}	16	31	62		
Gate-Drain charge	Q_{gd}	-	25	49		
Turn-on delay time	$t_{d(on)}$	-	18	36	ns	V_{GS}=-10V, V_{DS}=-30V, R_{G_ext}=3Ω, Id=-30A
Rise time	t_r	49	98	196		
Turn-off delay time	$t_{d(off)}$	47	93	186		
Fall time	t_f	57	113	226		
Gate resistance	R_G	-	1.85	8	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	-	-	-67	A	Tc = 25°C
Diode pulse current	Is pulse	-	-	-268	A	Tc = 25°C
Body Diode Forward Voltage	V_{SD}	-	-0.8	-1.3	V	V_{GS}=0V,I_{SD}=-30A
Body Diode Reverse Recovery Time	t_{rr}	-	23	46	ns	I_F=-30A, dI/dt=100A/μs
Body Diode Reverse Recovery Charge	Q_{rr}	-	10	20	nC	

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Typical Performance Characteristics

Fig 1: Output Characteristics

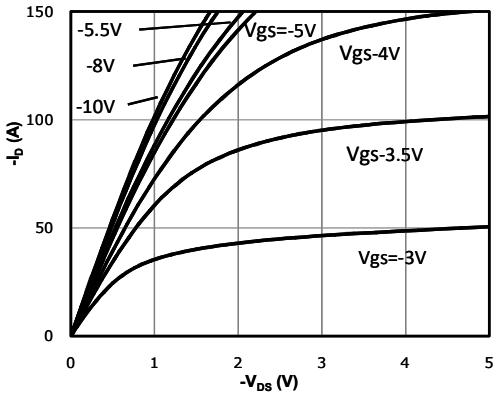


Fig 2: Transfer Characteristics

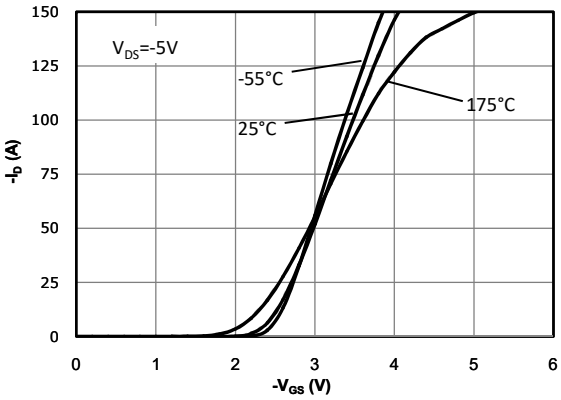


Fig 3: Rds(on) vs Drain Current and Gate Voltage

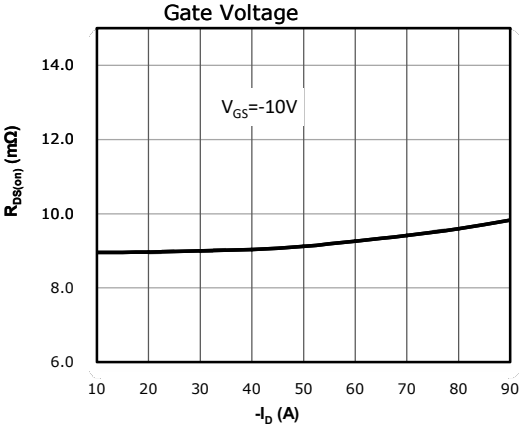


Fig 4: Rds(on) vs Gate Voltage

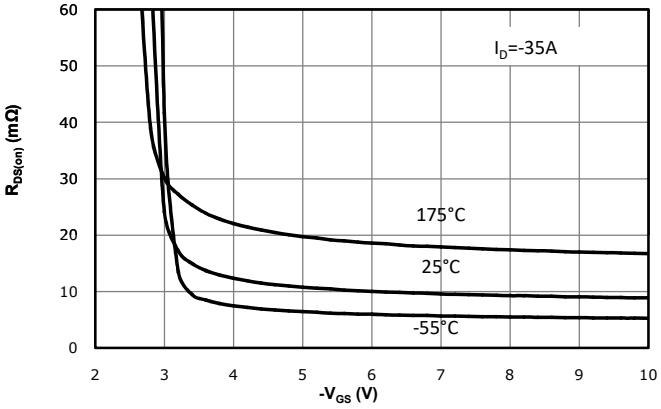


Fig 5: Rds(on) vs. Temperature

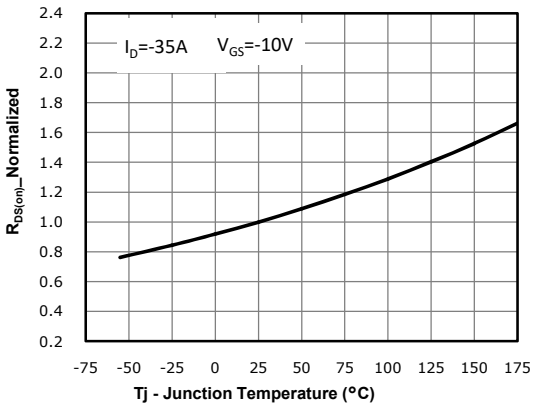
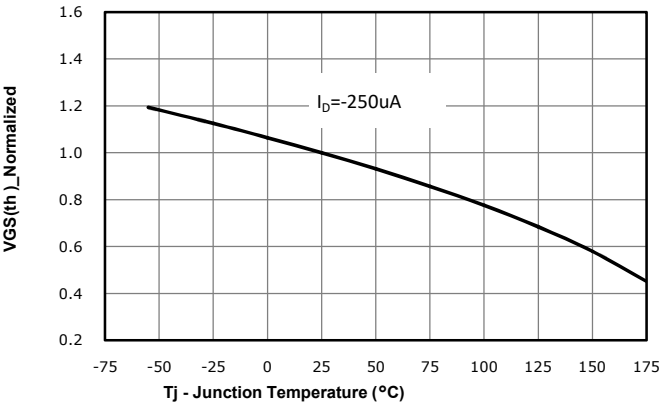


Fig 6: Vgs(th) vs. Temperature



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Fig 7: BVds vs. Temperature

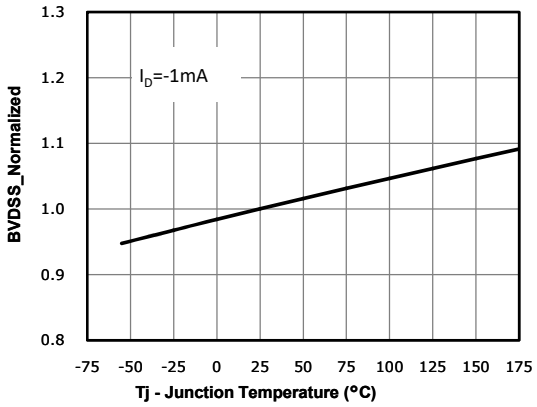


Fig 8: Capacitance Characteristics

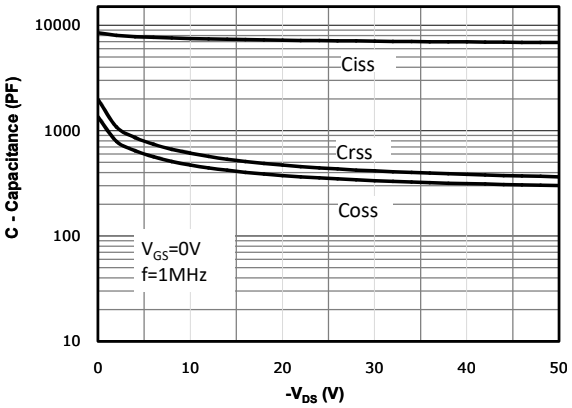


Fig 9: Gate Charge Characteristics

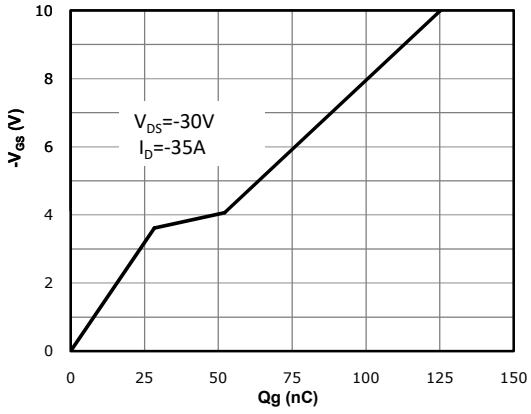


Fig 10: Body-diode Forward Characteristics

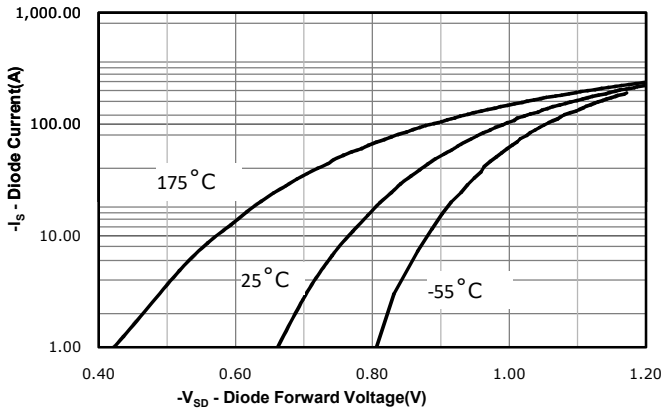


Fig 11: Power Dissipation

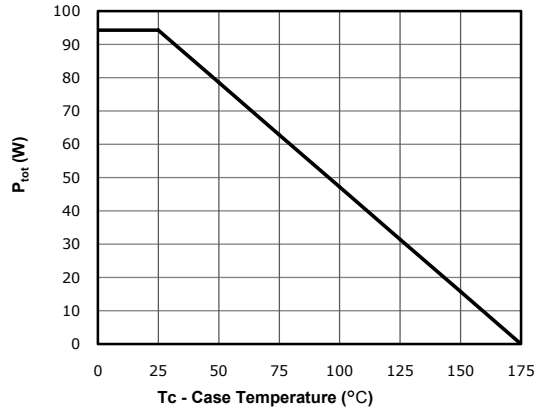
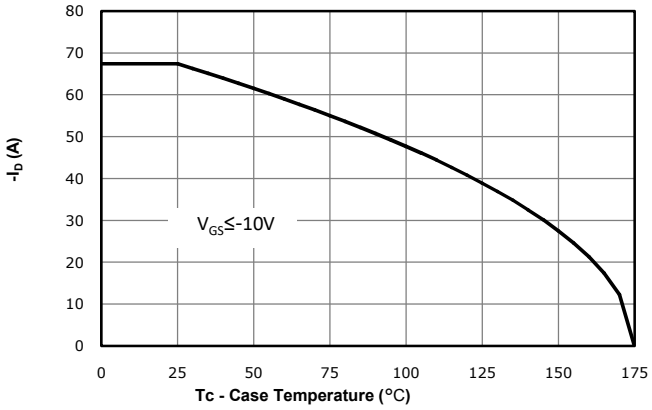


Fig 12: Drain Current Derating



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Fig 13: Safe Operating Area

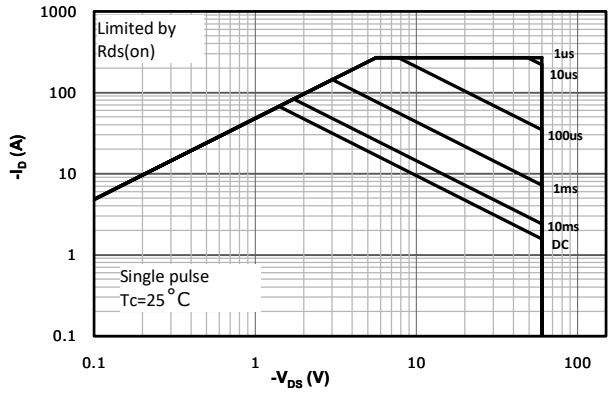
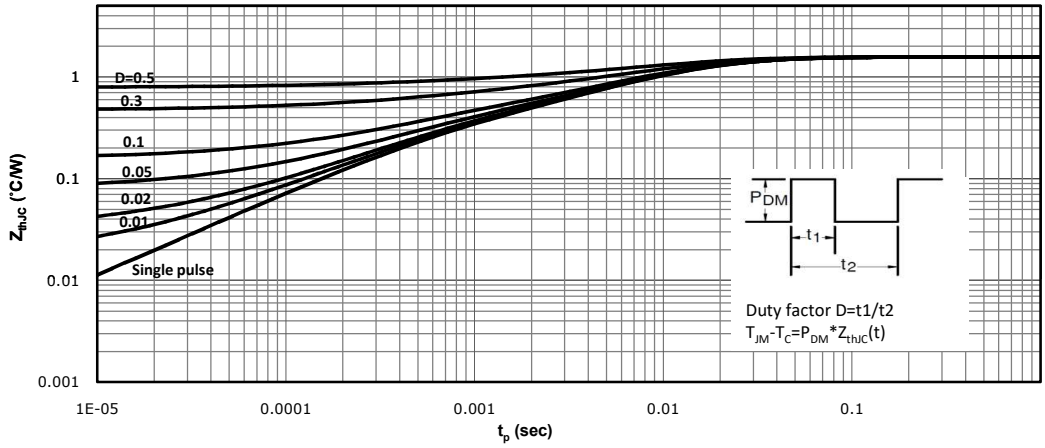


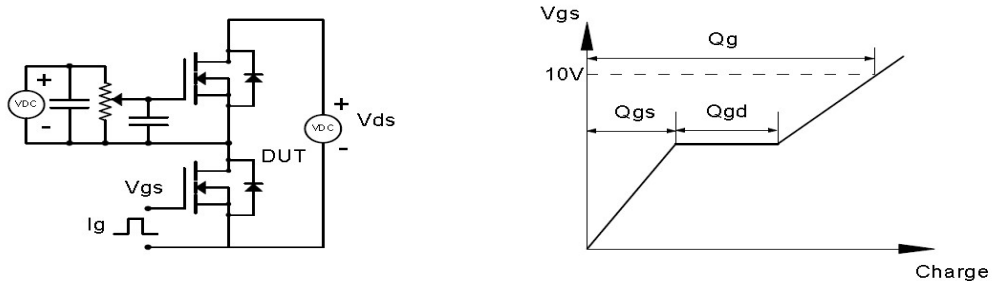
Fig 14: Max. Transient Thermal Impedance



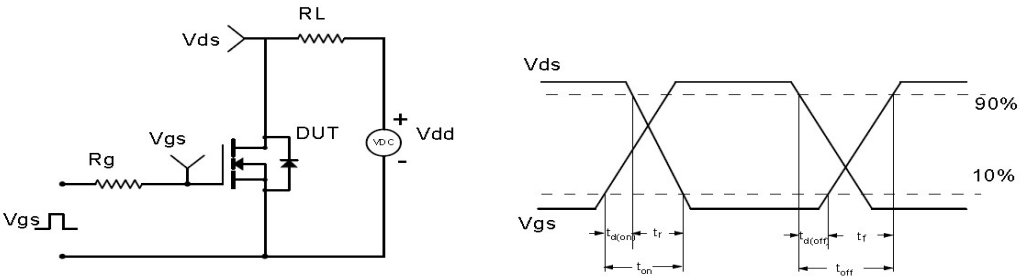
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Test Circuit & Waveform

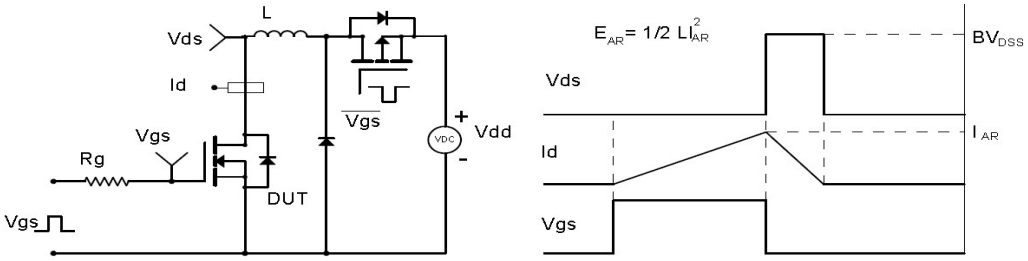
Gate Charge Test Circuit & Waveform



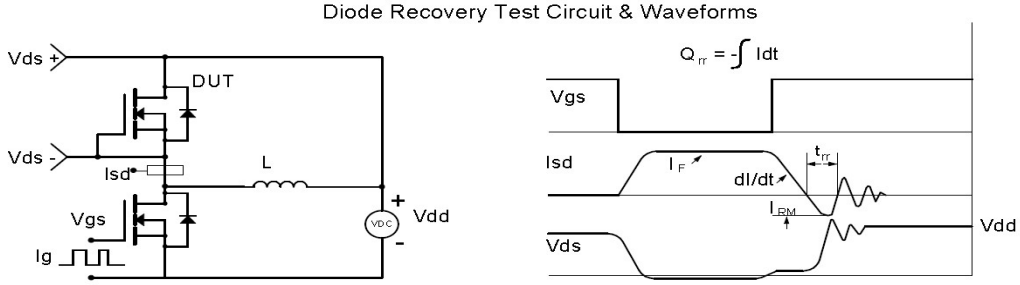
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms

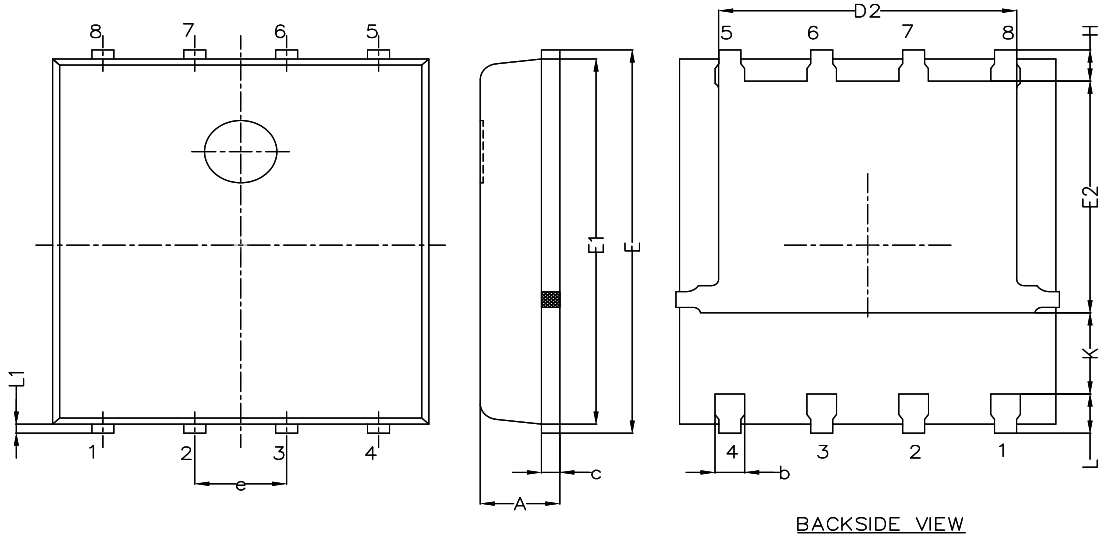


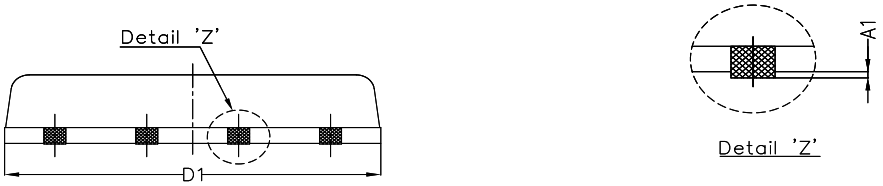
Diode Recovery Test Circuit & Waveforms



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Package Outline: PDFN5X6 Type X





Symbol	Dimensions In Millimeters		
	Min.	Nom.	Max.
A	1.00	1.10	1.20
A1	0.00	-	0.05
b	0.30	0.40	0.50
c	0.20	0.25	0.30
D1	5.00	5.20	5.40
D2	3.80	4.10	4.30
E	6.00	6.15	6.30
E1	5.76	5.86	5.96
E2	3.52	3.72	3.92
e		1.27 BSC	
H	0.40	0.50	0.60
K	1.10	-	-
L	0.50	0.60	0.71
L1	0.05	0.15	0.25

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Marking



NOTE:
XAAAAAAA-Y

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

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Revision History

Revision	Date	Major changes
1.0	2023/11/15	Release of preliminary 1.0 version.
1.1	2024/1/15	Update VTH SPEC
1.2	2024/3/13	Update Marking
2.0	2024/4/23	Update Package Marking and Ordering Information
2.1	2024/5/15	Add Is /Is pulse
2.2	2025/2/27	Update Package Name

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