

650V 10mΩ SiC MOSFET**Features:**

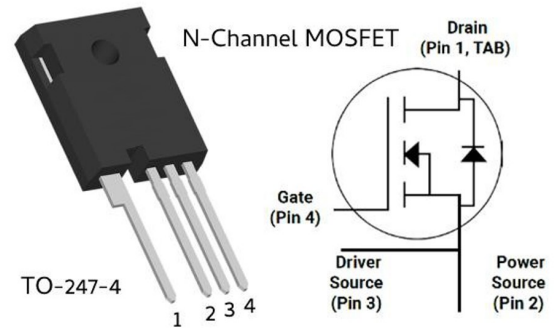
- High blocking voltage with low $R_{DS(on)}$
- High frequency operation with low Capacitance
- Simple to drive with -4V/+18V gate
- Robust body diode with low Q_{rr}
- 100% Avalanche Tested

Benefits

- Superior robustness and system reliability
- Higher system efficiency
- Easier paralleling without thermal runaway
- Capable of high temperature application
- Faster and more efficient switching

Applications:

- Solar Inverters
- SMPS
- Energy storage systems
- High performance DC-DC converters
- UPS
- Motor drivers

**Key Performance and Package Parameters**

Type	V_{DS}	$R_{DS(on)}$	$I_D@25^\circ C$	$I_D@100^\circ C$	Marking	Package
PD010S065ANC	650V	10mΩ	155A	112A	PD010S065ANC	TO247-4

Absolute Maximum Ratings($T_C=25^\circ C$ unless otherwise specified)

Parameter	Symbols	Conditions	Value	Unit
Drain - source voltage	$V_{DS(max)}$	$V_{GS}=0V, I_D=100\mu A$	650	V
Gate - source voltage	$V_{GS(max)}$	AC ($f>1Hz$, duty cycle $<1\%$, pulse width $<200ns$)	-9 / +23	V
Gate – source voltage	$V_{GS(op)}$	Recommend operation	-4 / +18	V
Continuous drain current (limited by $T_{J,max}$)	I_D	$V_{GS}=18V, T_C=25^\circ C$ $V_{GS}=18V, T_C=100^\circ C$	155 112	A
Pulsed drain current	$I_{D(pulse)}$	$T_C=25^\circ C$	519	A
Total power dissipation	P_D	$T_C=25^\circ C$	600	W
Operating junction temperature	T_J		-55 to 175	$^\circ C$
Storage temperature	T_{STG}		-55 to 175	$^\circ C$
Soldering temperature	T_L		260	$^\circ C$
Avalanche capability, single pulse*	I_{AV}	$V_{DD}=100V, V_{GS}=10V, L=2mH$	55	A
Avalanche capability, single pulse**	E_{AV}	$V_{DD}=100V, V_{GS}=10V, L=2mH$	3025	mJ

*100% tested in 60% rating

**100% tested in 36% rating

Electrical Characteristics at Tc= 25°C (unless otherwise specified)

Parameter	Symbols	Conditions	Value			Unit
			Min	Typ	Max	
Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=100\mu A$	650	-	-	V
Gate threshold voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=30mA$	2.6	3.1	4.2	V
		$V_{DS}=V_{GS}, I_D=30mA, T_J=150^\circ C$	-	2.4	-	
		$V_{DS}=V_{GS}, I_D=30mA, T_J=175^\circ C$	-	2.3	-	
Zero gate voltage drain current	I_{DSS}	$V_{DS}=650V, V_{GS}=0V$	0	0.5	60	μA
		$V_{DS}=650V, V_{GS}=0V, T_J=175^\circ C$	0	5	200	
Gate-source leakage current	I_{GSS}	$V_{GS}=18V, V_{DS}=0V$	0	5	100	nA
Gate-source leakage current	I_{GSS}	$V_{GS}=-4V, V_{DS}=0V$	-100	-5	0	nA
Drain-source on-state resistance	$R_{DS(on)}$	$V_{GS}=18V, I_D=75A$	-	10	14	mΩ
		$V_{GS}=18V, I_D=75A, T_J=175^\circ C$	-	13	-	
Transconductance	gfs	$V_{DS}=20V, I_D=75A$	-	76	-	S
		$V_{DS}=20V, I_D=75A, T_J=175^\circ C$	-	66	-	
Input capacitance	C_{iss}	$V_{DS}=400V, V_{GS}=0V$ $f=100KHZ, V_{AC}=25mV$	-	5915	-	pF
Output capacitance	C_{oss}		-	434	-	pF
Reverse transfer capacitance	C_{rss}		-	20	-	pF
Coss stored energy	E_{oss}		-	41	-	μJ
Turn-on switching energy	E_{ON}	$V_{DS}=400V, V_{GS}=-4V/18V$	-	241	-	μJ
Turn-off switching energy	E_{OFF}	$I_D=75A, R_{G(ext)}=2\Omega, L=200\mu H$	-	210	-	μJ
Turn-on delay time	$t_{d(on)}$	$V_{DS}=400V, V_{GS}=-4V/18V$ $I_D=75A, R_{G(ext)}=2\Omega, L=200\mu H$	-	18	-	ns
Rise time	t_r		-	46	-	ns
Turn-off delaytime	$t_{d(off)}$		-	71	-	ns
Fall time	t_f		-	9	-	ns
Total gate charge	Q_g	$V_{DS}=400V, V_{GS}=-4V/18V$ $I_D=75A$	-	235	-	nC
Gate-source charge	Q_{gs}		-	72	-	nC
Gate-drain charge	Q_{gd}		-	77	-	nC
Internal gate input resistance	$R_{g(int)}$	$f=1MHz, I_D=0A$	-	10	-	Ω

***Turn-off with -4V gate bias is highly recommended

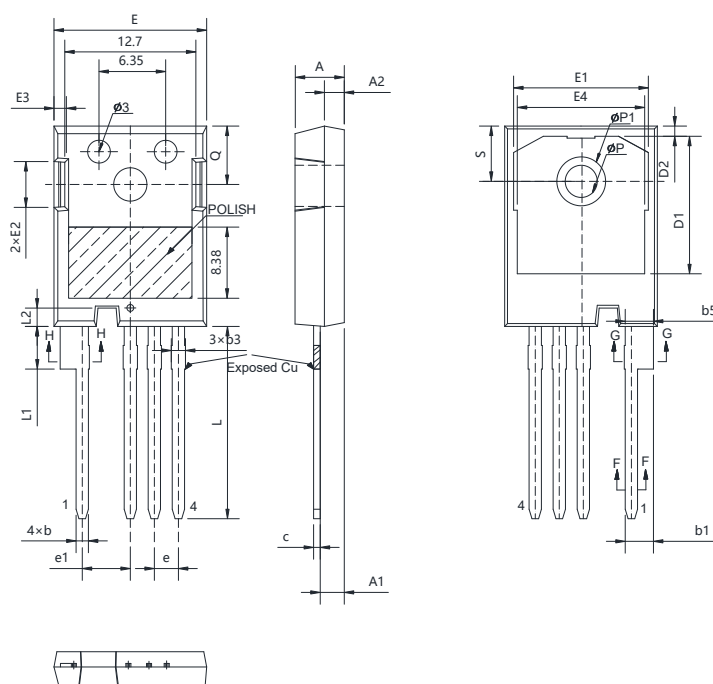
Reverse Diode Characteristics at Tc= 25°C (unless otherwise specified)

Parameter	Symbols	Conditions	Value			Unit
			Min	Typ	Max	
Diode Forward Voltage	V_{SD}	$V_{GS}=-4V, I_{SD}=40A, T_J=25^\circ C$	-	4.2	-	V
Diode Forward Voltage	V_{SD}	$V_{GS}=-4V, I_{SD}=40A, T_J=175^\circ C$	-	3.8	-	V
Continuous diode forward current	I_S	$V_{GS}=-4V, T_J=25^\circ C$	-	122	-	A
Reverse recovery time	t_{rr}	$V_{GS}=-4V, I_{SD}=75A,$	-	24	-	ns
Reverse recovery charge	Q_{rr}	$V_R=400V, L=200\mu H,$	-	484	-	nC
Peak reverse recovery current	I_{rrm}	$diff/dt=1420A/\mu s$	-	24	-	A

Thermal Characteristics

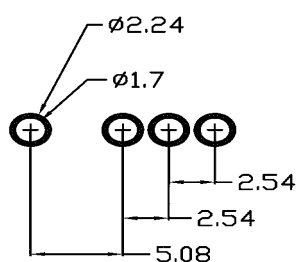
Parameter	Symbols	Conditions	Value			Unit
			Min	Typ	Max	
Thermal resistance	$R_{th(j-c)}$	Junction to case	-	0.22	0.25	°C/W

Package Dimensions

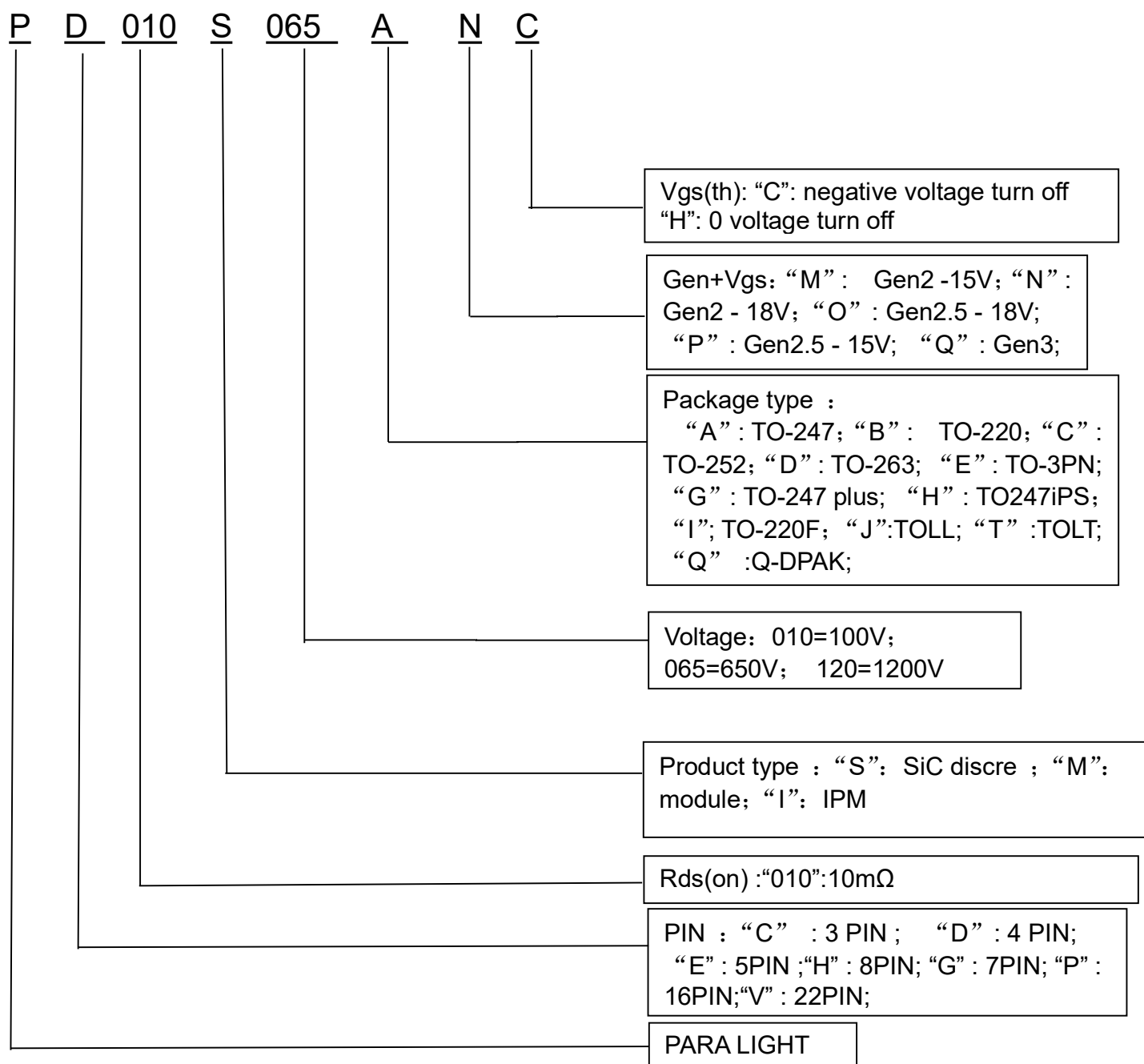


Common dimensions(mm)							
Symbol	Min	Typ	Max	Symbol	Min	Typ	Max
A	4.83	5.02	5.21	E2	3.68	4.40	5.10
A1	2.29	2.41	2.54	E3	1.00	1.45	1.90
A2	1.91	2.00	2.16	E4	12.38	13.26	13.43
b	1.07	1.20	1.33	e	2.54BSC		
b1	2.39	2.67	2.94	e1	5.08BSC		
b3	1.07	1.30	1.60	L	17.31	17.57	17.82
b5	2.39	2.53	2.69	L1	3.97	4.19	4.37
c	0.55	0.60	0.65	L2	2.35	2.50	2.65
D	23.30	23.45	23.60	ØP	3.51	3.61	3.65
D1	16.25	16.55	17.65	ØP1	7.19REF.		
D2	0.95	1.19	1.25	Q	5.49	5.79	6.00
E	15.75	15.94	16.13	S	6.04	6.17	6.30
E1	13.10	14.02	14.15				

Recommended Solder Pad Layout



PART NO. SYSTEM :



Revision history

Document revision history

Date	Version	Changes
2025.08.29	A / 0	First release.
2025.10.31	A / 1	Error correction