PDG020C120J

General Description

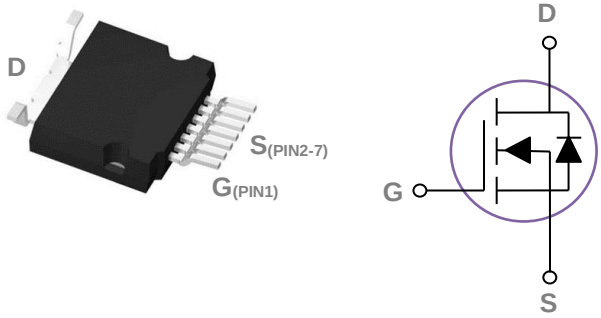
These N-Channel enhancement mode power field effect transistors are using silicon carbide technology. This advanced technology has been especially tailored to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode. These devices are well suited for high efficiency fast switching applications.

BVDSS	$R_{DS(ON)(typ)}$	ID
1200V	20mΩ	80A

Features

- *1200V,80A, $R_{DS(ON)(typ)}$ =20mΩ@VGS = 20V*
- *Improved dv/dt capability*
- *Fast switching*
- *Green Device Available*

T2PAK Pin Configuration



Applications

- *SMPS*
- *Solar Inverters*
- *Renewable energy*
- *EV battery chargers*

Absolute Maximum Ratings Tc=25℃ unless otherwise noted

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	1200	V
$V_{GS(max)}$	Gate-Source Voltage , max. static voltage	+25/-10	V
$V_{GS(op)}$	Recommended Drive Voltage	+18/-5	V
I_D	Drain Current – Continuous (T_C=25℃)	80	A
	Drain Current – Continuous (T_C=100℃)	56	A
I_{DM}	Drain Current – Pulsed[1]	200	A
P_D	Power Dissipation (T_C=25℃)	428	W
	Power Dissipation – Derate above 25℃	2.86	W/℃
T_{STG}	Storage Temperature Range	-55 to 175	℃
T_J	Operating Junction Temperature Range	-55 to 175	℃

Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JC}$	Thermal Resistance Junction to Case	0.35	---	℃/W

Electrical Characteristics (T_J=25 ℃, unless otherwise noted)

Off Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V , I_D=100μA	1200	---	---	V
I_{DSS}	Drain-Source Leakage Current	V_{DS}=1200V , V_{GS}=0V , T_J=25℃	---	---	10	μA
I_{GSS}	Gate-Source Leakage Current	V_{GS}=22V , V_{DS}=0V	---	---	100	nA

On Characteristics

$R_{DS(ON)}$	Static Drain-Source On-Resistance	V_{GS}=18V , I_D=50A	---	20	26	mΩ
$R_{DS(ON)}$	Static Drain-Source On-Resistance	V_{GS}=15V , I_D=50A	---	25	---	mΩ
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D =20mA	2.0	2.8	4.0	V

Dynamic and switching Characteristics

Q_g	Total Gate Charge	V_{DS}=800V , V_{GS}=-5/18V , I_{DS}=50A	---	200	---	nC
Q_{gs}	Gate-Source Charge		---	35	---	
Q_{gd}	Gate-Drain Charge		---	52	---	
$T_{d(on)}$	Turn-On Delay Time	V_{DD}=800V , V_{GS}=-5/18V , R_G=6Ω , I_{DS}=50A	---	20	---	ns
T_r	Rise Time		---	30	---	
$T_{d(off)}$	Turn-Off Delay Time		---	35	---	
T_f	Fall Time		---	10	---	
C_{iss}	Input Capacitance	V_{DS}=1000V , V_{GS}=0V , F=500kHz , V_{AC}=25mV	---	4000	---	pF
C_{oss}	Output Capacitance		---	230	---	
C_{rss}	Reverse Transfer Capacitance		---	12	---	
R_g	Gate resistance	V_{GS}=0V, V_{DS}=0V, F=1MHz	---	0.6	---	Ω

Drain-Source Diode Characteristics and Maximum Ratings

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current	V_G=V_D=0V , Force Current	---	---	80	A
V_{SD}	Diode Forward Voltage	V_{GS}=-5V , I_S=33A , T_J=25℃	---	4.1	---	V
t_{rr}	Reverse Recovery Time	V_R=400V, I_S=50A di/dt=300A/μs, T_J=25℃	---	65	---	ns
Q_{rr}	Reverse Recovery Charge		---	200	---	nC

Note :
1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. The data tested by pulsed , pulse width ≦ 300μs , duty cycle ≦ 2%.

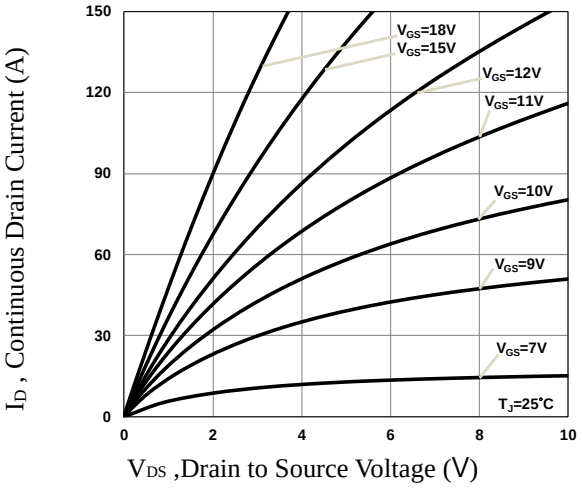


Fig.1 Typical Output Characteristics

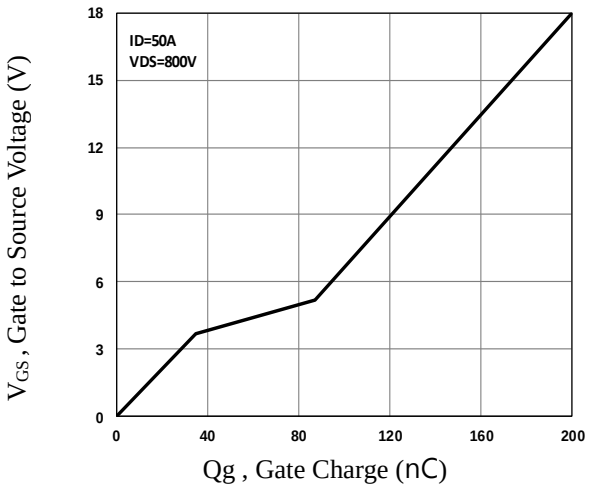


Fig.2 Gate Charge Characteristics

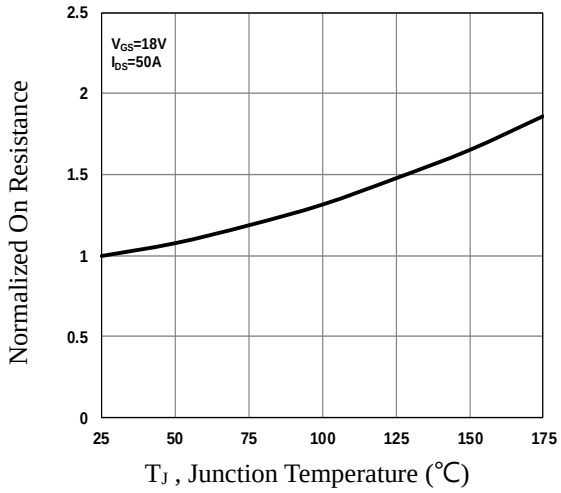


Fig.3 Normalized RDSON vs. T_J

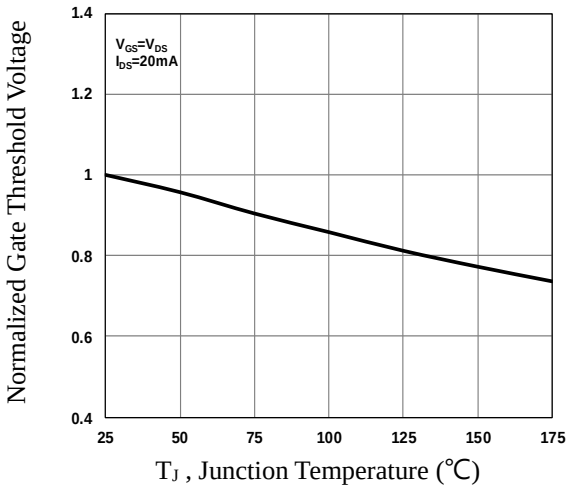


Fig.4 Normalized V_{th} vs. T_J

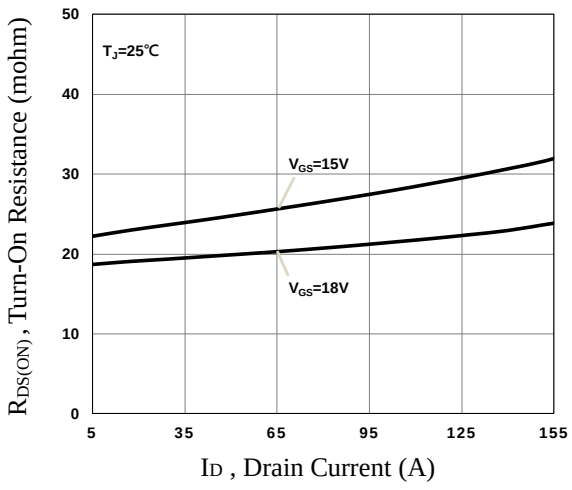


Fig.5 Turn-On Resistance vs. ID

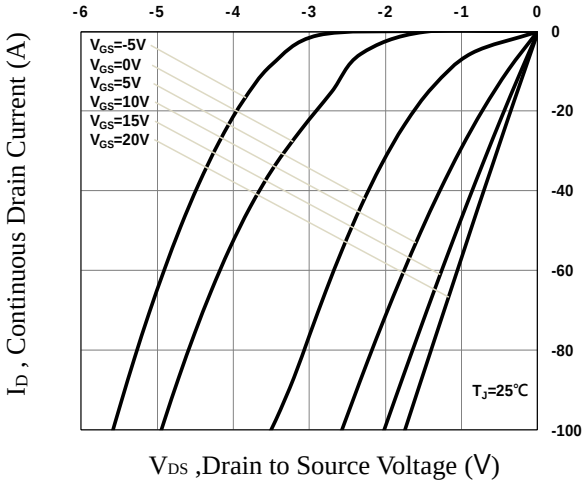


Fig.6 3rd Quadrant Characteristic

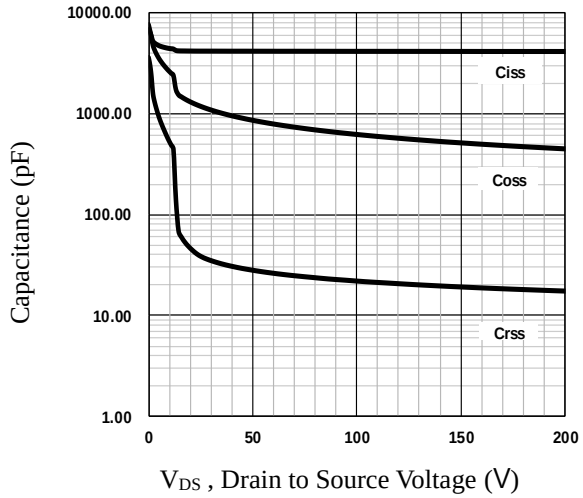


Fig.7 Capacitance Characteristics

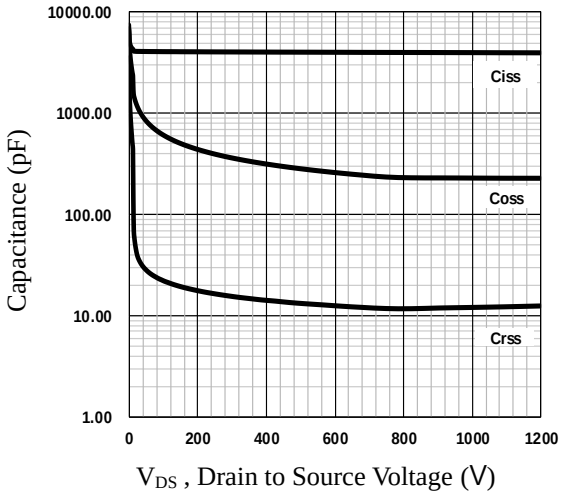


Fig.8 Capacitance Characteristics

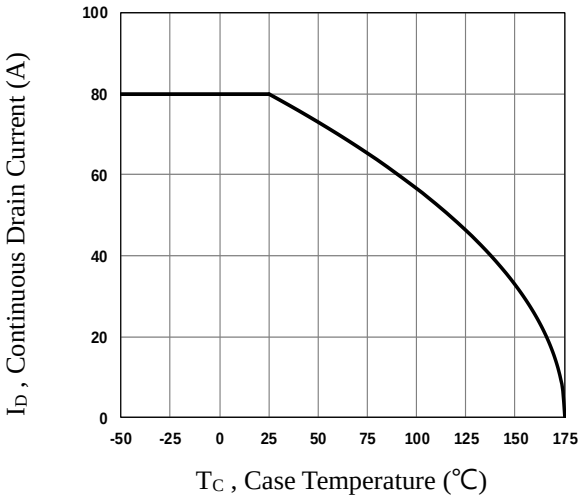


Fig.9 Continuous Drain Current vs. T_C

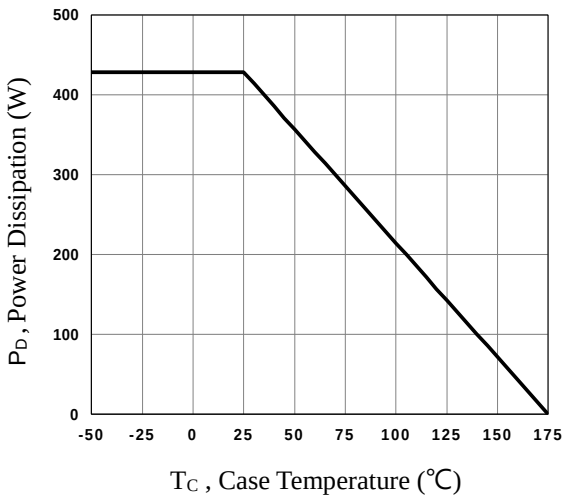
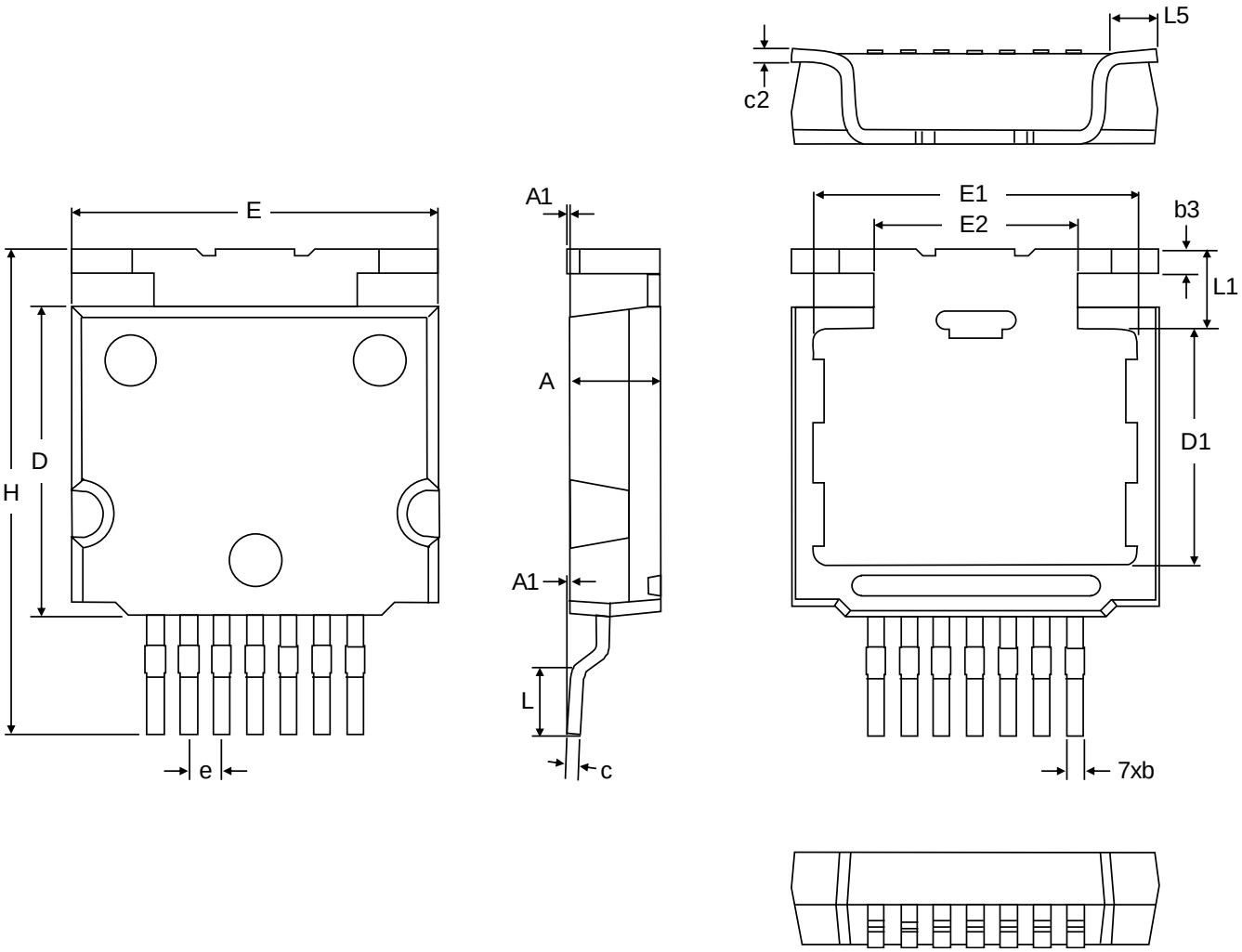


Fig.10 Power Dissipation Derating vs. T_C

T2PAK PACKAGE INFORMATION



Symbol	Dimensions In Millimeters		Symbol	Dimensions In Millimeters	
	MIN	MAX		MIN	MAX
A	3.40	3.60	E	13.90	14.10
A1	0.00	0.25	E1	12.30	12.50
b	0.50	0.70	E2	7.75	7.85
b3	0.80	1.00	e	1.27BSC	
c	0.40	0.60	H	18.00	19.00
c2	0.40	0.60	L	2.30	2.75
D	11.70	12.00	L1	3.05NOM	
D1	8.80	9.10	L5	1.70	2.15

T2PAK RECOMMENDED LAND PATTERN