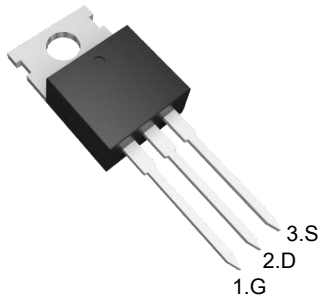
PJM250N30TO
N-Channel Enhancement Mode Power MOSFET

Features

- Excellent package for good heat dissipation
- Fully characterized avalanche voltage and current
- High density cell design for ultra low $R_{DS(on)}$
- V_{DS}= 30V,I_D= 250A
  $R_{DS(on)}$< 2.2mΩ @V_{GS}= 10V

TO-220

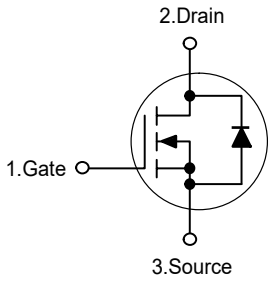


1.Gate 2.Drain 3.Source

Applications

- Power switching application
- Hard switched and high frequency circuits
- Uninterruptible power supply

Schematic diagram



Absolute Maximum Ratings

Ratings at 25℃ ambient temperature unless otherwise specified.

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	±20	V
Drain Current-Continuous	I_D	250	A
Drain Current-Pulsed Note1	I_{DM}	1000	A
Single Pulse Avalanche Energy Note4	E_{AS}	890	mJ
Maximum Power Dissipation	P_D	215	W
Junction Temperature	T_J	150	°C
Storage Temperature Range	T_{STG}	-55 to +150	°C

Thermal Characteristics

Maximum Junction-to-Case Note2	$R_{\theta JC}$	1.42	°C/W

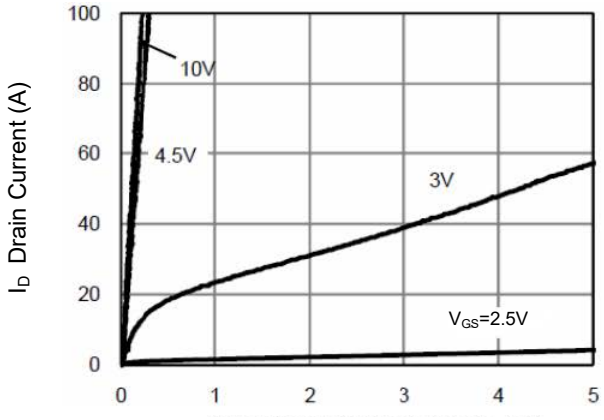
Electrical Characteristics

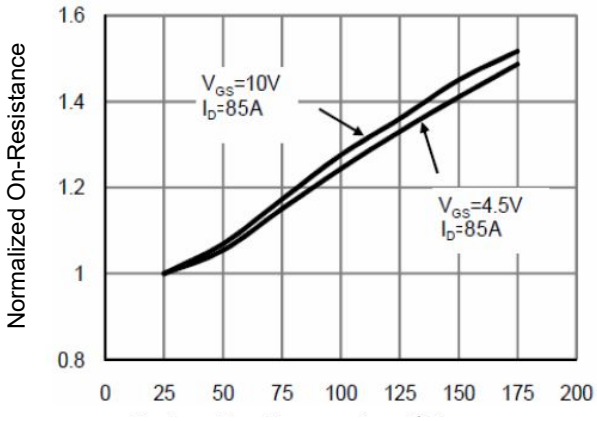
(Ta=25℃ unless otherwise specified)

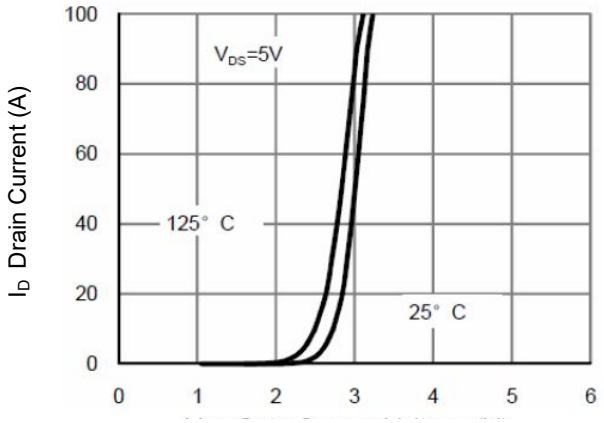
Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS}=0V,I_D=250μA	30	--	--	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=30V,V_{GS}=0V	--	--	1	μA
Gate-Body Leakage Current	I_{GSS}	V_{GS}=±20V,V_{DS}=0V	--	--	±0.1	μA
Gate Threshold Voltage Note3	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=250μA	1	--	3	V
Drain-Source On-Resistance Note3	$R_{DS(on)}$	V_{GS}=10V,I_D=85A	--	--	2.2	mΩ
Forward Transconductance Note3	g_{FS}	V_{DS}=5V,I_D=85A	--	80	--	S
Dynamic Characteristics						
Input Capacitance	C_{iss}	V_{DS}=15V,V_{GS}=0V, f=1MHz	--	6150	--	pF
Output Capacitance	C_{oss}		--	1550	--	pF
Reverse Transfer Capacitance	C_{rss}		--	105	--	pF
Switching Characteristics						
Turn-on Delay Time	$t_{d(on)}$	V_{DS}=15V,I_D=85A, V_{GS}=10V,R_G=1.6Ω	--	13	--	nS
Turn-on Rise Time	t_r		--	7.5	--	nS
Turn-off Delay Time	$t_{d(off)}$		--	52	--	nS
Turn-off Fall Time	t_f		--	8.6	--	nS
Total Gate Charge	Q_g	V_{DS}=15V,I_D=85A, V_{GS}=10V	--	98	--	nC
Gate-Source Charge	Q_{gs}		--	16	--	nC
Gate-Drain Charge	Q_{gd}		--	11	--	nC
Source-Drain Diode Characteristics						
Diode Forward Voltage Note3	V_{SD}	V_{GS}=0V,I_S=250A	--	--	1.2	V
Diode Forward Current Note2	I_S		--	--	250	A

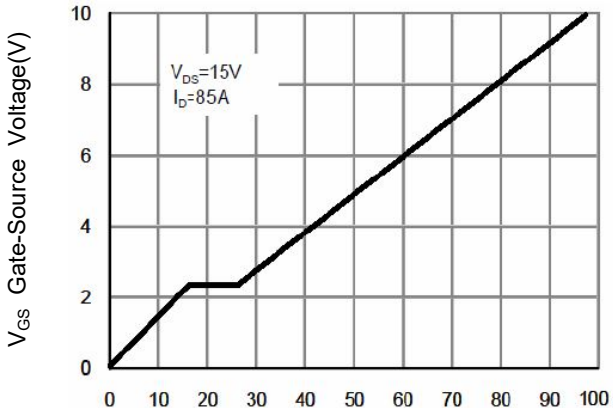
Note: 1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2.Surface Mounted on FR4 Board, t ≤ 10 sec.
3.Pulse Test: Pulse width≤300μs, duty cycle≤2%
4.E_{AS} Condition:T_j=25℃,V_{DD}=20V,V_{GS} =10V,L=0.5mH,R_G=25Ω

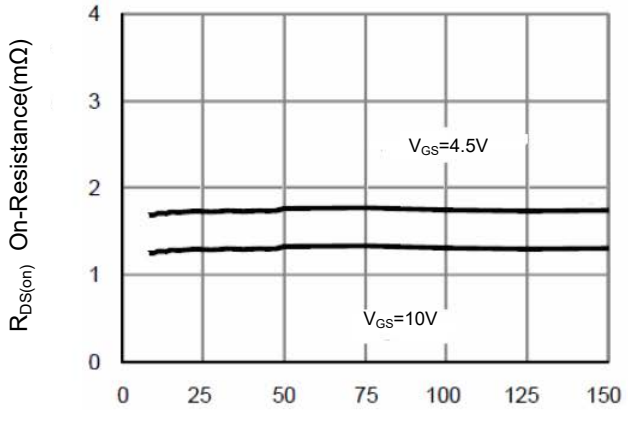
Typical Characteristic Curves

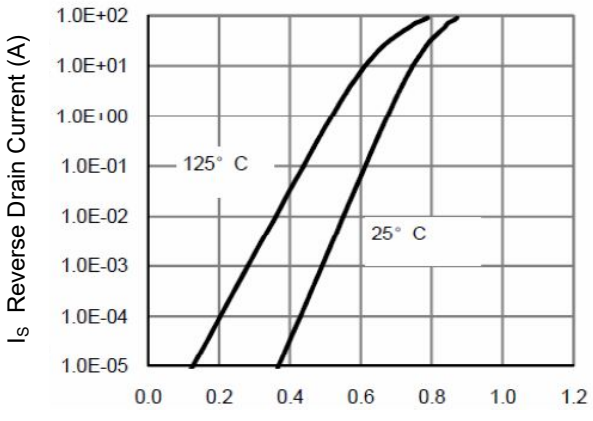


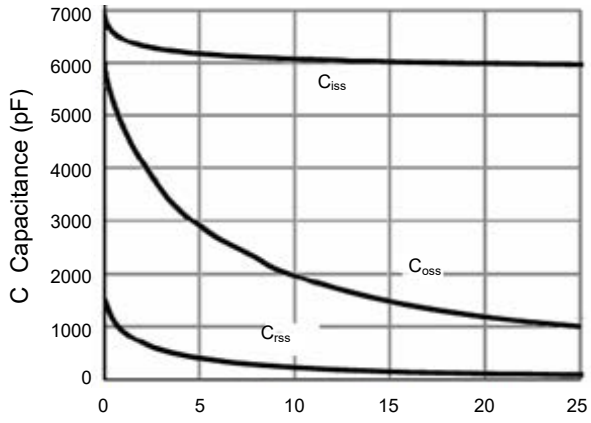


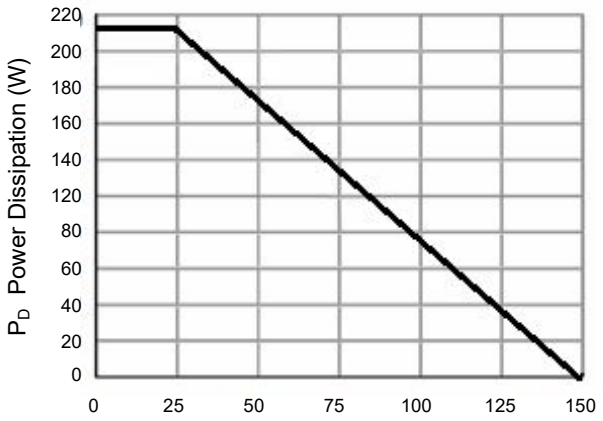


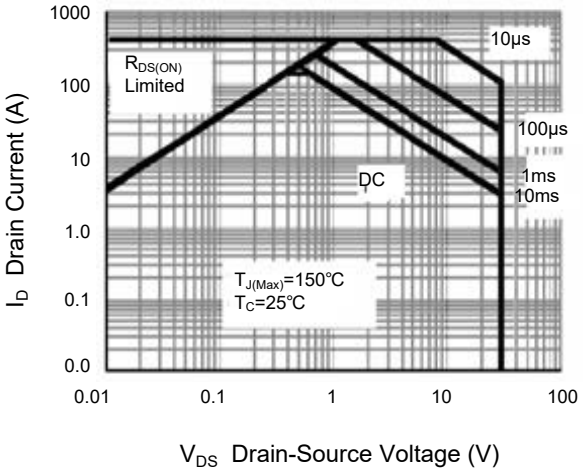


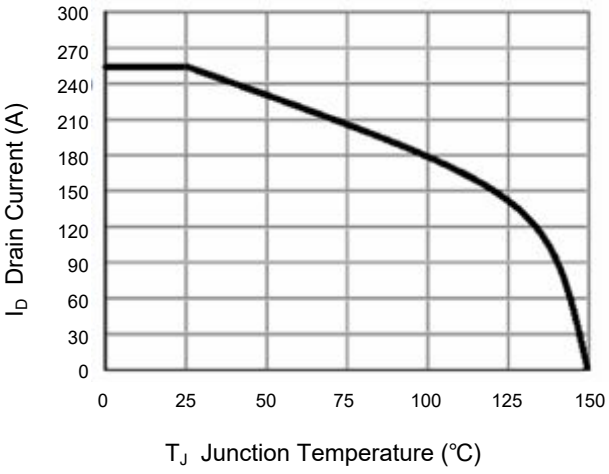


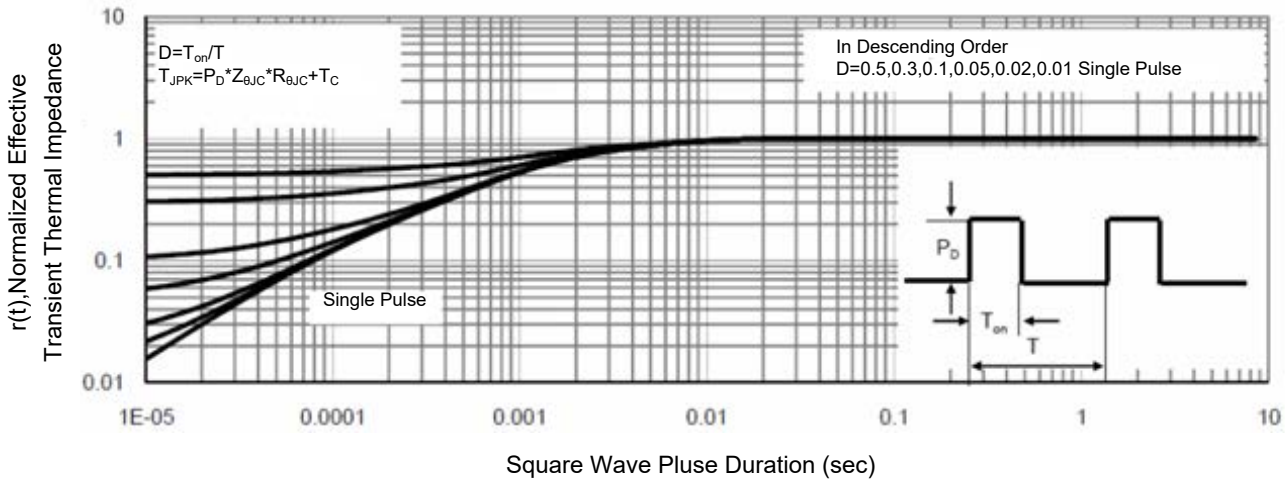



C Capacitance (pF)
7000
6000
5000
4000
3000
2000
1000
0
Ciss
Coss
Crss
0
5
10
15
20
25
VDS Drain-Source Voltage (V)


PD Power Dissipation (W)
220
200
180
160
140
120
80
60
40
20
0
0
25
50
75
100
125
150
TJ Junction Temperature (℃)


ID Drain Current (A)
1000
100
10
1.0
0.1
0.0
RDS(ON) Limited
10μs
100μs
1ms
10ms
DC
TJ(Max)=150℃
TC=25℃
0.01
0.1
1
10
100
VDS Drain-Source Voltage (V)


ID Drain Current (A)
300
270
240
210
180
150
120
90
60
30
0
0
25
50
75
100
125
150
TJ Junction Temperature (℃)


r(t),Normalized Effective Transient Thermal Impedance
10
1
0.1
0.01
D=Ton/T
TJPK=PD*ZθJC*RθJC+TC
In Descending Order
D=0.5,0.3,0.1,0.05,0.02,0.01 Single Pulse
Single Pulse
PD
Ton
T
1E-05
0.0001
0.001
0.01
0.1
1
10
Square Wave Pluse Duration (sec)

Package Outline

TO-220
Dimensions in mm