PJD05N70N

General Description

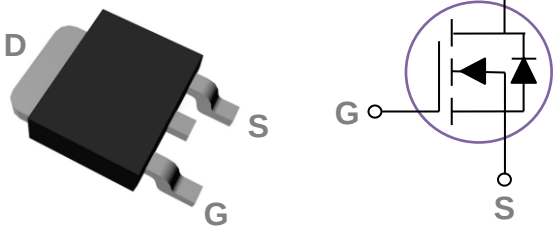
These N-Channel enhancement mode power field effect transistors are using super junction MOS technology. This advanced technology has been especially tailored to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode.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

BVDSS	RDSON	ID
700V	1.6Ω	5A

Features

- *700V,5A, RDS(ON) =1.6Ω @VGS = 10V*
- *Improved dv/dt capability*
- *Fast switching*
- *Green Device Available*

TO252 Pin Configuration



Applications

- *PFC Power Supply Stages*
- *Motor Control*
- *DC-DC Converters*
- *Adapter*

Absolute Maximum Ratings Tc=25℃ unless otherwise noted

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	700	V
V_{GS}	Gate-Source Voltage	±30	V
I_D	Drain Current – Continuous (T_C=25℃)	5	A
	Drain Current – Continuous (T_C=100℃)	3.2	A
I_{DM}	Drain Current – Pulsed[1]	20	A
EAS	Single Pulse Avalanche Energy	159	mJ
P_D	Power Dissipation (T_C=25℃)	33	W
	Power Dissipation – Derate above 25℃	0.26	W/℃
T_{STG}	Storage Temperature Range	-55 to 150	℃
T_J	Operating Junction Temperature Range	-55 to 150	℃

Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction to ambient	---	62	℃/W
$R_{\theta JC}$	Thermal Resistance Junction to Case	---	3.8	℃/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=1mA	700	---	---	V
I_{DSS}	Drain-Source Leakage Current	V_{DS}=700V , V_{GS}=0V , T_J=25℃	---	---	1	μA
		V_{DS}=560V , V_{GS}=0V , T_J=100℃	---	---	10	μA
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±30V , V_{DS}=0V	---	---	±100	nA

On Characteristics

$R_{DS(ON)}$	Static Drain-Source On-Resistance	V_{GS}=10V , I_D=1A	---	1.3	1.6	Ω
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D =250μA	2	3	4	V

Dynamic and switching Characteristics[2]

Q_g	Total Gate Charge	V_{DS}=560V , V_{GS}=10V , I_D=5A	---	9	18	nC
Q_{gs}	Gate-Source Charge		---	0.8	3	
Q_{gd}	Gate-Drain Charge		---	5.5	11	
$T_{d(on)}$	Turn-On Delay Time	V_{DS}=350V , V_{GS}=10V , R_G=25Ω I_D=5A	---	10	20	ns
T_r	Rise Time		---	25	50	
$T_{d(off)}$	Turn-Off Delay Time		---	25	50	
T_f	Fall Time		---	30	60	
C_{iss}	Input Capacitance	V_{DS}=100V , V_{GS}=0V , F=1MHz	---	220	440	pF
C_{oss}	Output Capacitance		---	18	36	
C_{rss}	Reverse Transfer Capacitance		---	4	8	
R_g	Gate resistance	V_{GS}=0V, V_{DS}=0V, F=1MHz	---	18	---	Ω

Guaranteed Avalanche Energy

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
EAS	Single Pulse Avalanche Energy	V_{DD}=100V, L=79.9mH, I_{AS}=1A	40	---	---	mJ

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	---	---	5	A
I_{SM}	Pulsed Source Current		---	---	10	A
V_{SD}	Diode Forward Voltage	V_{GS}=0V , I_S=5A , T_J=25℃	---	---	1.4	V
t_{rr}	Reverse Recovery Time	V_R=400V, I_S=3A di/dt=100A/μs , T_J=25℃	---	230	---	ns
Q_{rr}	Reverse Recovery Charge		---	1.6	---	μC

Note :
1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. Essentially independent of operating temperature.

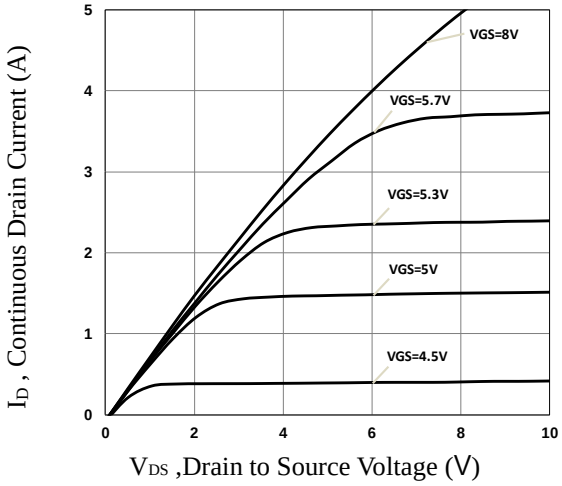


Fig.1 Typical Output Characteristics

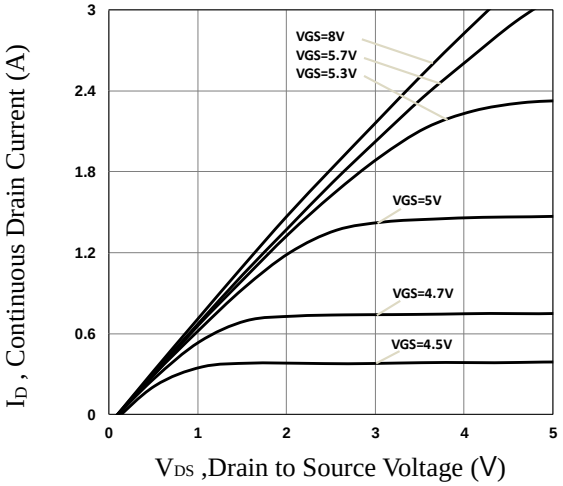


Fig.2 Typical Output Characteristics

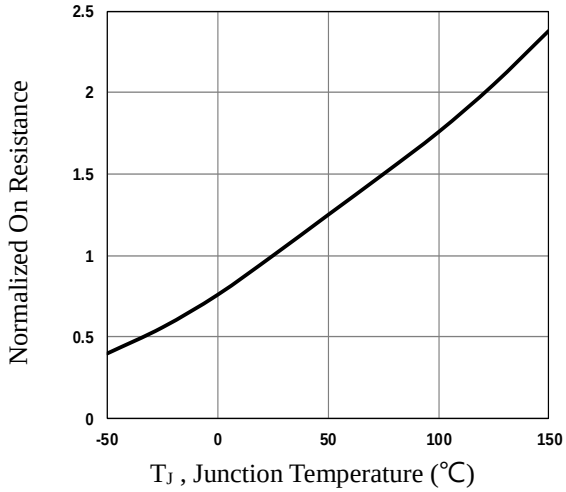


Fig.3 Normalized RDSON vs. T_J

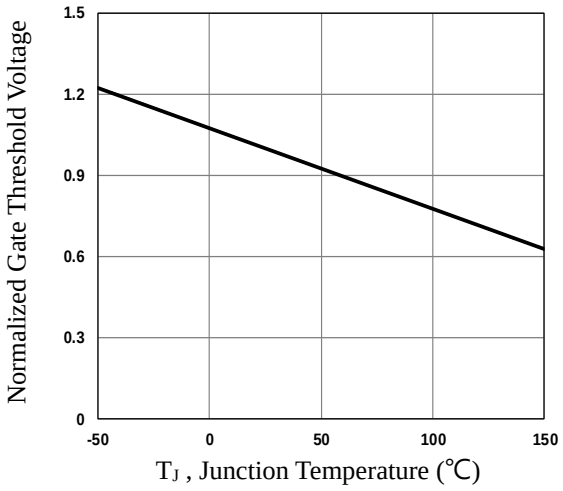


Fig.4 Normalized V_{th} vs. T_J

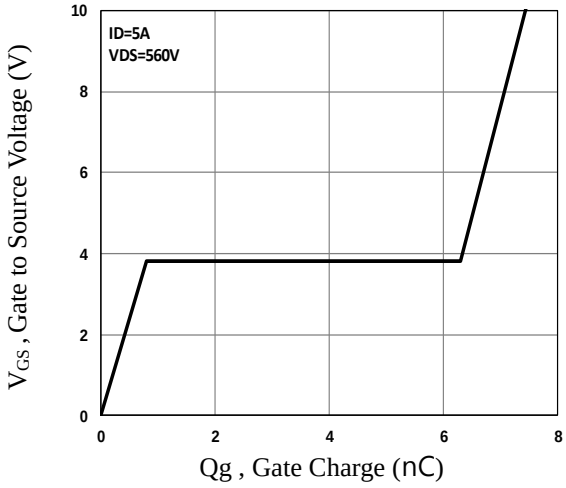


Fig.5 Gate Charge Characteristics

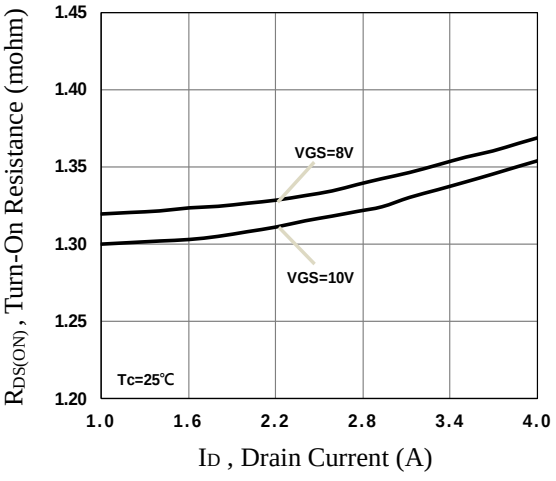


Fig.6 Turn-On Resistance vs. ID

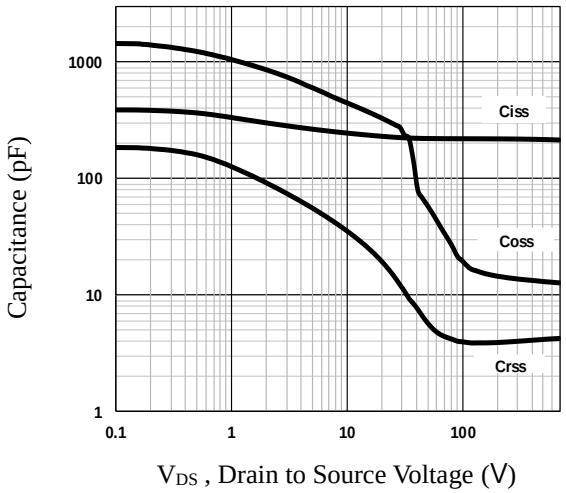


Fig.7 Capacitance Characteristics

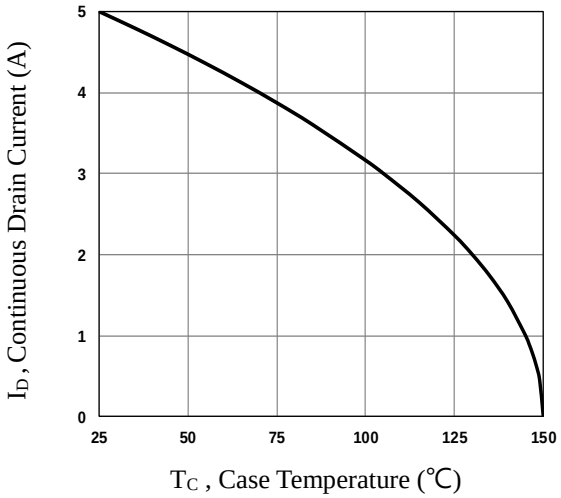


Fig.8 Continuous Drain Current vs. T_C

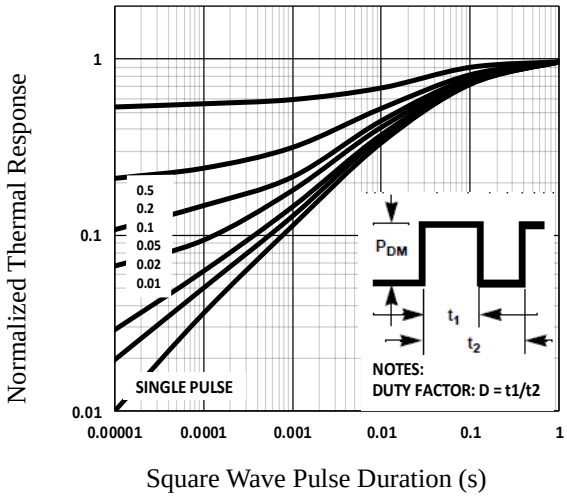


Fig.9 Normalized Transient Impedance

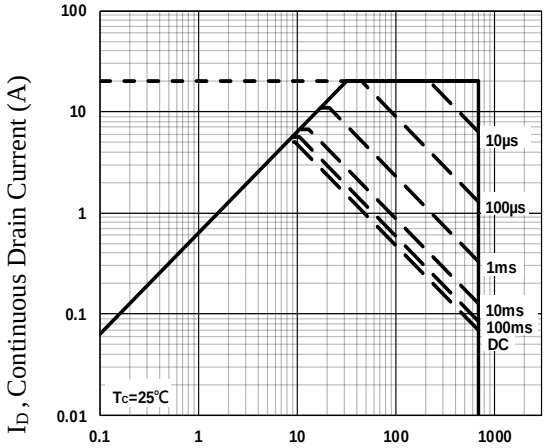


Fig.10 Maximum Safe Operation Area

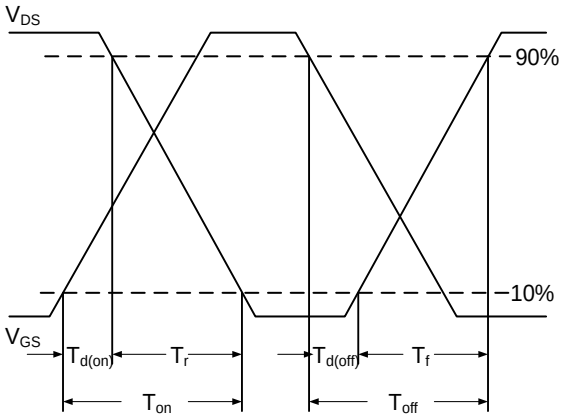


Fig.11 Switching Time Waveform

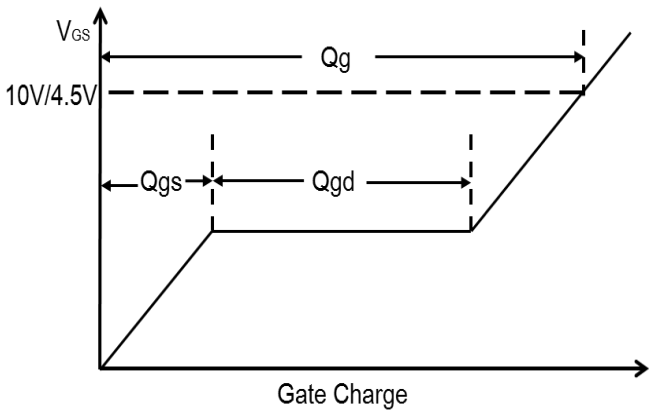
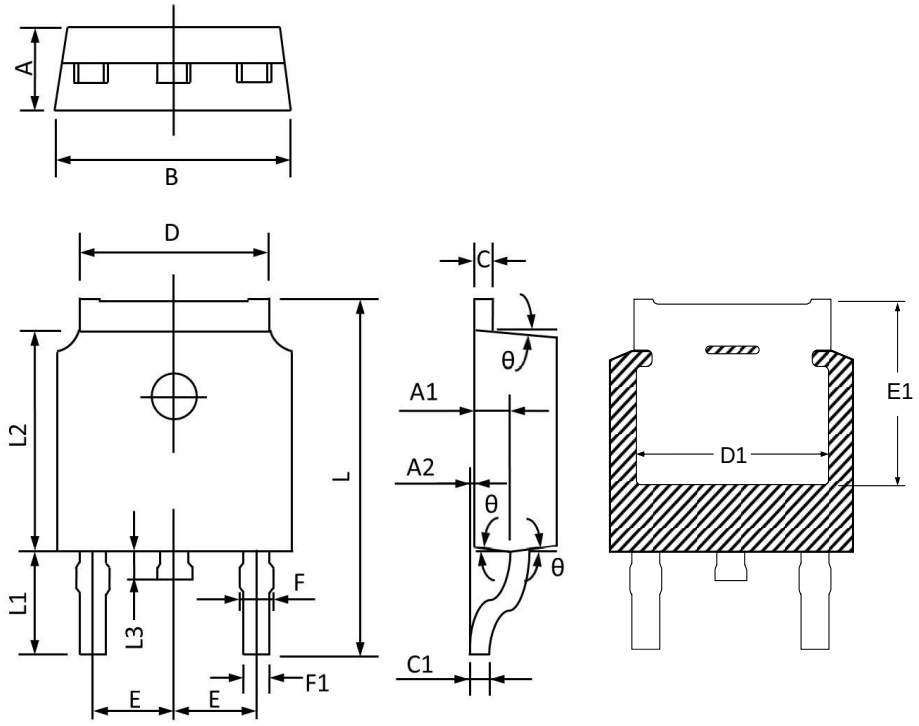


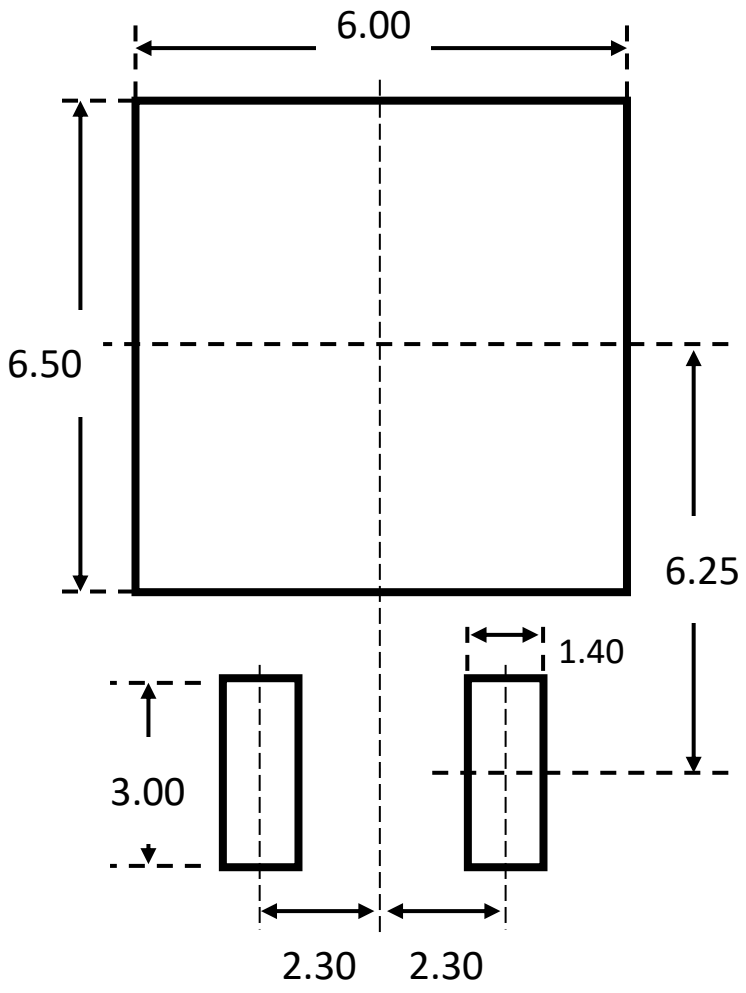
Fig.12 Gate Charge Waveform

TO252 PACKAGE INFORMATION



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MAX	MIN	MAX	MIN
A	2.450	2.150	0.096	0.085
A1	1.200	0.900	0.047	0.035
A2	0.250	0.000	0.010	0.000
B	6.800	6.300	0.268	0.248
C	0.600	0.350	0.024	0.014
C1	0.600	0.380	0.024	0.015
D	5.500	5.100	0.217	0.201
D1	5.400	4.950	0.212	0.195
E	2.400	2.000	0.094	0.079
E1	5.650	4.950	0.222	0.194
F	1.150	0.600	0.045	0.024
F1	0.900	0.500	0.035	0.020
L	10.400	9.400	0.409	0.370
L1	3.100	2.400	0.122	0.094
L2	6.300	5.300	0.248	0.209
L3	1.200	0.600	0.047	0.024
θ	9°	3°	9°	3°

TO252 RECOMMENDED LAND PATTERN



unit : mm