

MT80G028PS

N-Channel Enhancement Mode Field Effect Transistor

Product Summary

- $V_{DS} = 85V$
- $I_D = 220A$
- $R_{DS(ON)} = 2.8 m\Omega @ V_{GS} = 10V$

Features

- Advanced Trench Process Technology.
- High Density Cell Design for Ultra Low On-Resistance.
- Lead free product is acquired.
- RoHS Compliant.
- PTO-252 Package

Applications

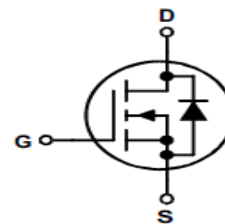
- Power switching application
- Hard switched and high frequency circuits
- Uninterruptible power supply



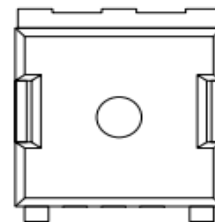
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Simplified Schematic



MARKING DIAGRAM & PIN ASSIGNMENT



Absolute Maximum Ratings ($T_A = 25^\circ C$ unless otherwise noted)

Symbol	Parameter	Steady State	Units
V_{DS}	Drain-Source Voltage	85	V
V_{GS}	Gate-Source Voltage	± 20	V
I_D	Continuous Drain Current ¹	220	A
I_{DM}	Pulsed Drain Current ²		
I_S	Continuous Source Current (Diode Conduction) ¹	220	A
E_{AS}	Single Pulse Drain-Source Avalanche Energy ³	498	mJ
P_D	Maximum Power Dissipation	325	W
T_J, T_{STG}	Operating Junction and Storage Temperature Range	-55~150	$^\circ C$

Notes:

1. Surface Mounted on 1" x 1" FR4 Board, $t \leq 10$ Sec.
2. Pulse width limited by maximum junction temperature.
3. The test condition is $T_J = 25^\circ C$, $V_{DD} = 30V$, $V_{GS} = 10V$, $L = 0.1mH$, $R_G = 25\Omega$, $I_{AS} = 50A$.

Thermal Characteristic

Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	0.4	$^{\circ}C/W$
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Electrical Characteristics ($T_C=25^{\circ}C$ unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	85	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=80V, V_{GS}=0V$	-	-	1	μA
Gate-Body Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	100	nA
On Characteristics						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	2.4	2.8	3.6	V
Drain-Source On-State Resistance ^a	$R_{DS(ON)}$	$V_{GS}=10V, I_D=50A$	-	2.8	3.3	m Ω
Dynamic Characteristics^b						
Input Capacitance	C_{iss}	$V_{DS}=40V, V_{GS}=0V,$ $F=0.1MHz$	-	4060	-	PF
Output Capacitance	C_{oss}		-	980	-	PF
Reverse Transfer Capacitance	C_{rss}		-	30	-	PF
Switching Characteristics						
Turn-on Delay Time	$t_{d(on)}$	$V_{DD}=40V, I_D=50A$ $V_{GS}=10V, R_G=3.0\Omega$	-	16	-	nS
Turn-on Rise Time	t_r		-	55	-	nS
Turn-Off Delay Time	$t_{d(off)}$		-	36	-	nS
Turn-Off Fall Time	t_f		-	23	-	nS
Total Gate Charge	Q_g	$V_{DS}=40V, I_D=50A,$ $V_{GS}=10V$	-	67	-	nC
Gate-Source Charge	Q_{gs}		-	22	-	nC
Gate-Drain Charge	Q_{gd}		-	18	-	nC
Drain-Source Diode Characteristics						
Diode Forward Voltage	V_{SD}	$V_{GS}=0V, I_S=50A$	-	0.75	1.2	V
Diode Forward Current	I_S		-	-	240	A
Reverse Recovery Time	t_{rr}	$T_J=25^{\circ}C, I_F=50A$ $di/dt=100A/\mu s$	-	59	-	nS
Reverse Recovery Charge	Q_{rr}		-	81	-	nC
Forward Turn-On Time	t_{on}	Intrinsic turn-on time is negligible (turn-on is dominated by LS+LD)				

Note:

a. Pulse test; pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.

b. Guaranteed by design, not subject to production testing.

Typical Electrical and Thermal Characteristics (Curves)

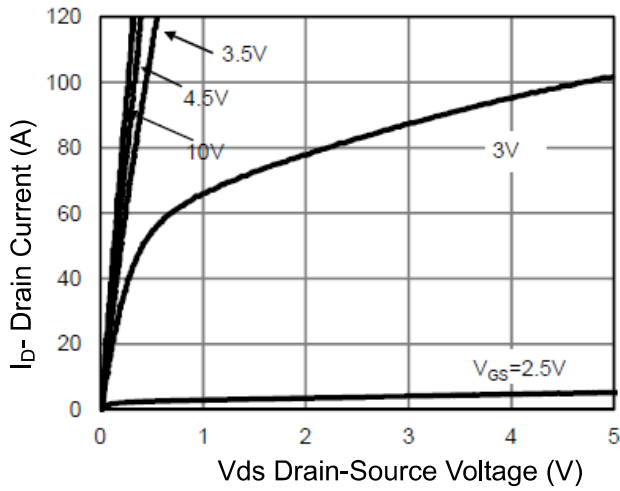


Figure 1 Output Characteristics

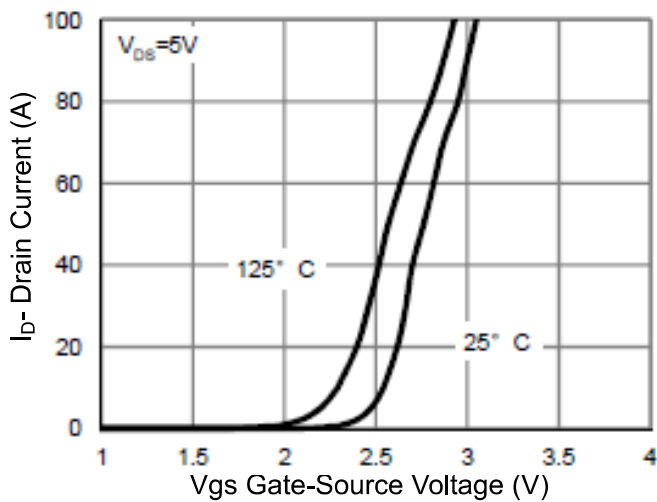


Figure 2 Transfer Characteristics

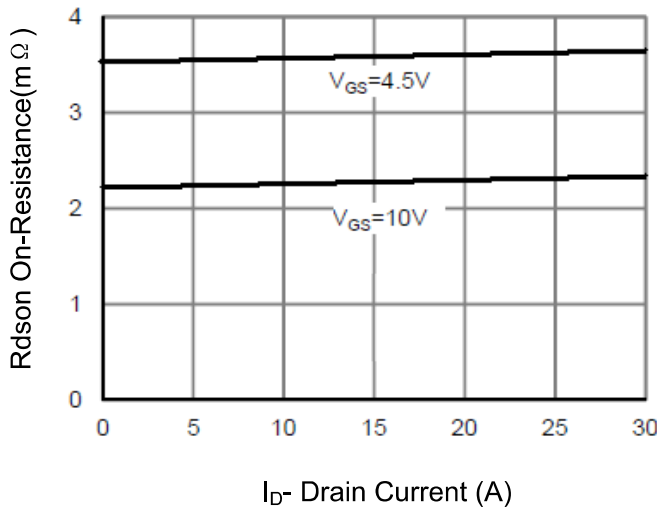


Figure 3 Rdson- Drain Current

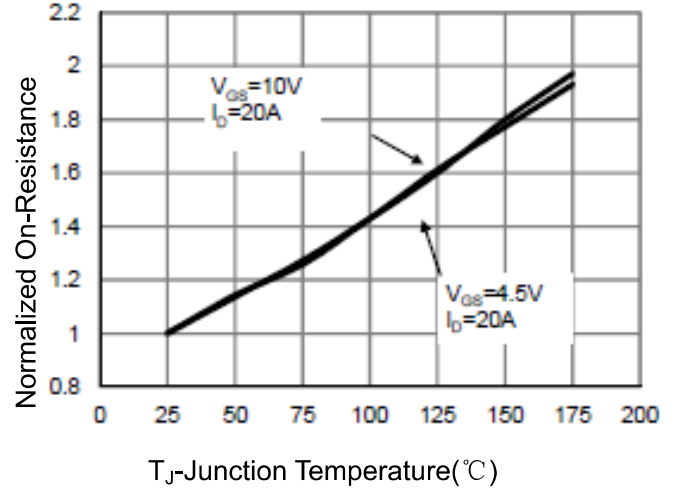


Figure 4 Rdson-Junction Temperature

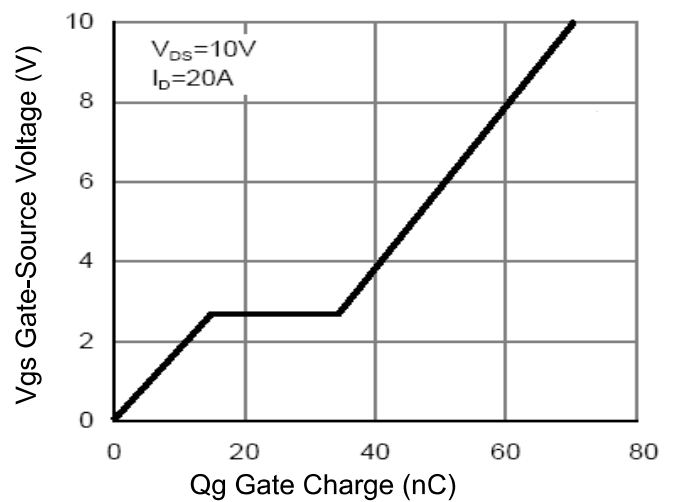


Figure 5 Gate Charge

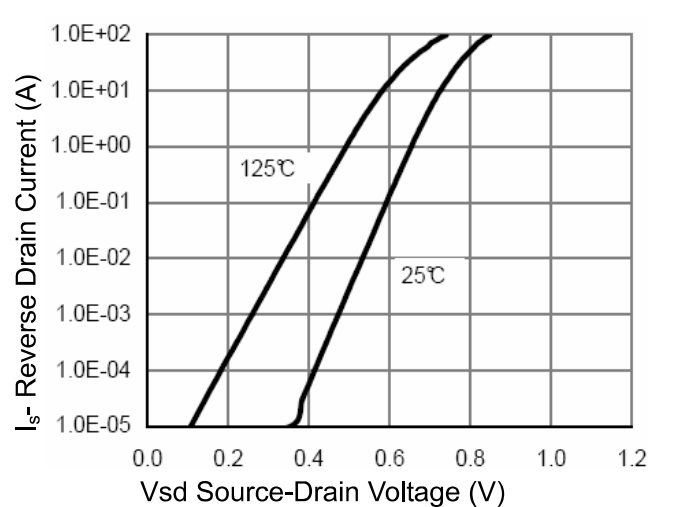


Figure 6 Source- Drain Diode Forward

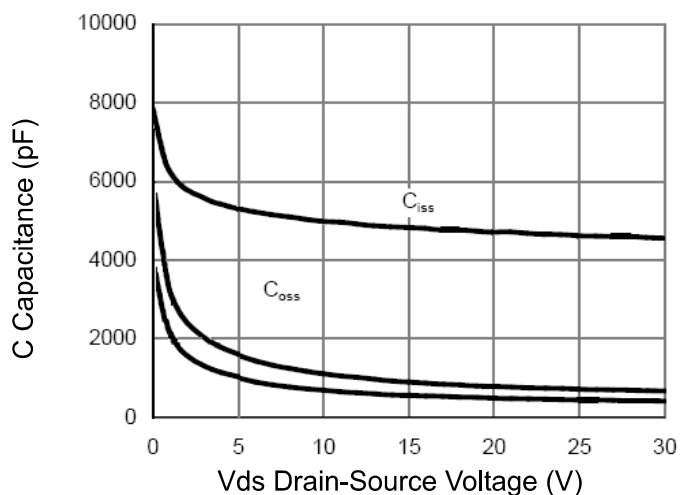


Figure 7 Capacitance vs Vds

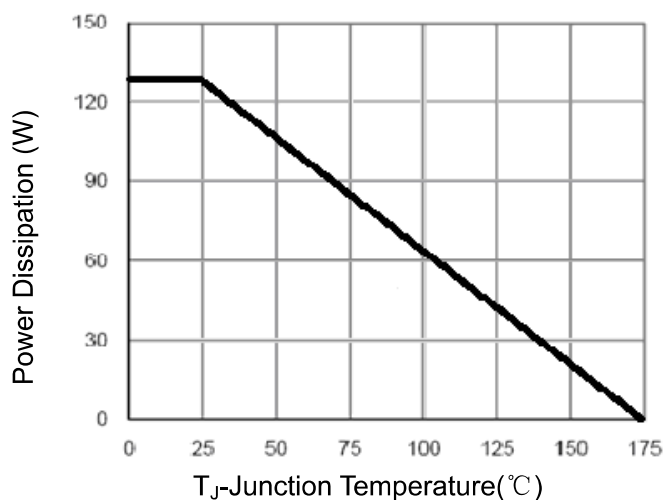


Figure 9 Power De-rating

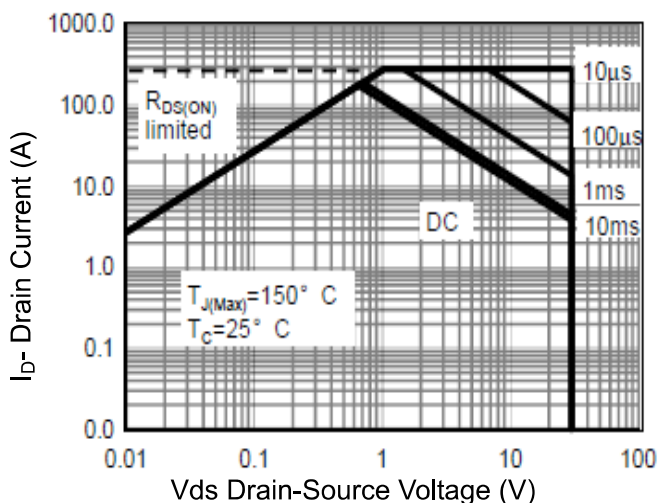


Figure 8 Safe Operation Area

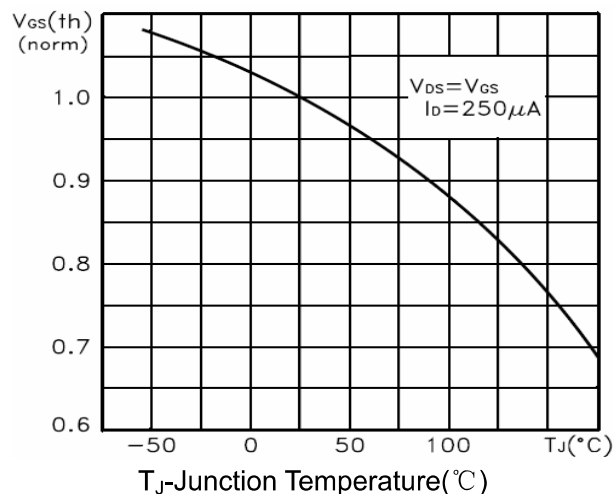


Figure 10 VGS(th) vs Junction Temperature

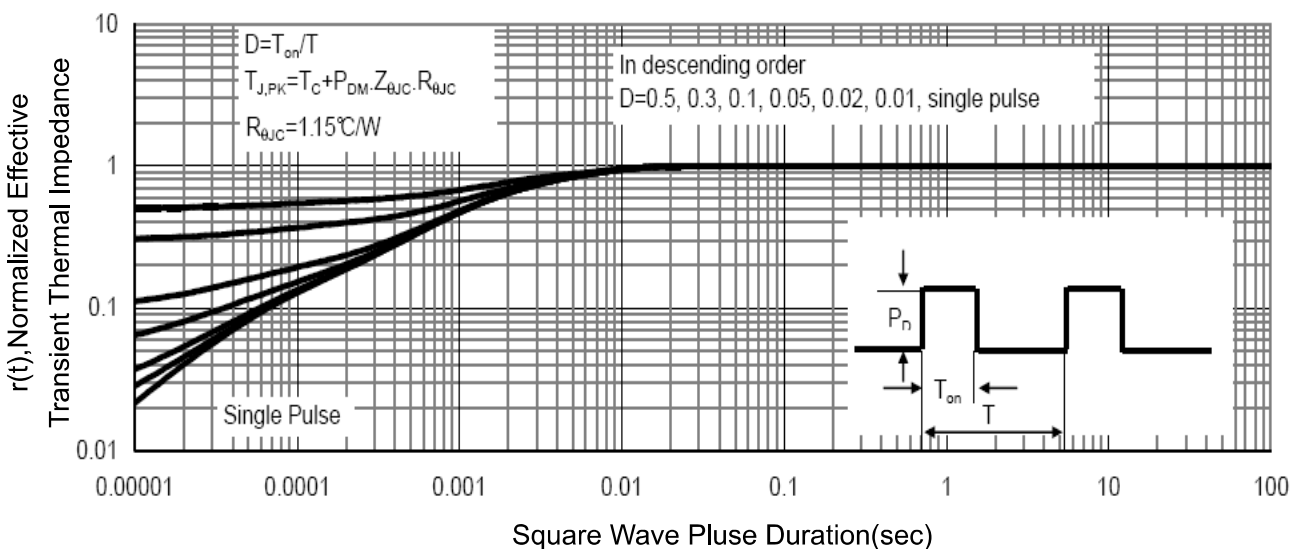
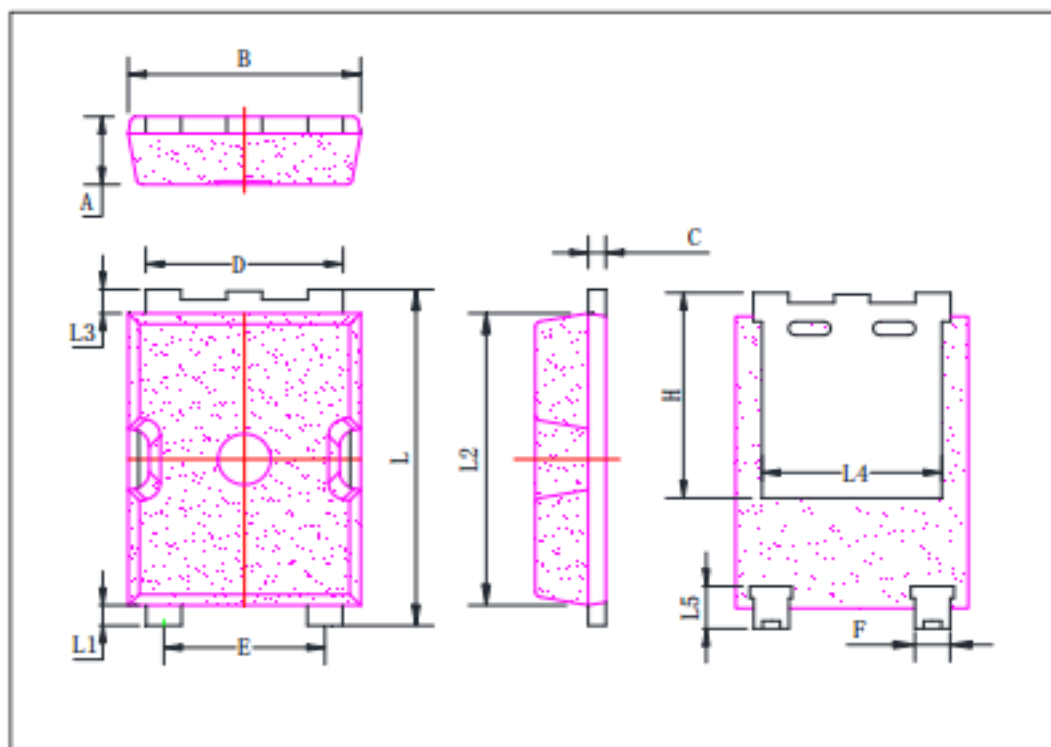


Figure 11 Normalized Maximum Transient Thermal Impedance

PTO-252-2L OUTLINE



Symbol	Min	Typ	Max
A	1.90	2.00	2.10
B	6.50	6.60	6.70
C	0.45	0.50	0.60
D	5.50	5.60	5.70
E	4.50	4.60	4.70
F	0.90	1.00	1.05
H	5.95	6.15	6.25
L	9.80	9.90	10.0
L1	0.50	0.60	0.70
L2	8.50	8.60	8.70
L3	0.60	0.70	0.80
L4	4.65	4.80	4.90
L5	1.05	1.20	1.30

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