

TM8090P

N-Channel Enhancement Mosfet

General Description

- Low $R_{DS(ON)}$
- RoHS and Halogen-Free Compliant

Applications

- Load switch
- PWM

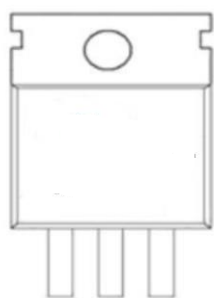
General Features

$V_{DS} = 80V$ $I_D = 90A$

$R_{DS(ON)} = 6.6m\Omega (typ.) @ V_{GS} = 10V$

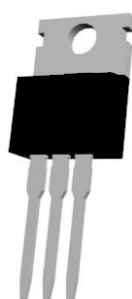
100% UIS Tested

100% R_g Tested

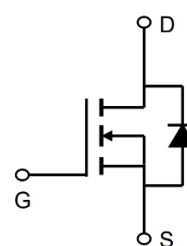


Marking: 90N08P

P:TO-220AB



G D S



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

Symbol	Parameter	Ratings	Units
V_{DS}	Drain-Source Voltage	80	V
V_{GS}	Gate-Source Voltage	± 20	V
I_D	Continuous Drain Current-	90	A
	Continuous Drain Current- $T_C = 100^\circ C$	57	
	Pulsed Drain Current	320	
E_{AS}	Single Pulse Avalanche Energy ⁵	529	mJ
P_D	Power Dissipation	170	W
T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55 to +175	$^\circ C$

Thermal Characteristics:

Symbol	Parameter	Max	Units
$R_{\theta JC}$	Thermal Resistance, Junction to Case ²	0.88	$^\circ C/W$
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	---	



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Electrical Characteristics: ($T_C=25^{\circ}\text{C}$ unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Off Characteristics						
BV _{DSS}	Drain-Sourctce Breakdown Voltage	V _{GS} =0V, I _D =250 μ A	80	---	---	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{GS} =0V, V _{DS} =80V	---	---	1	μ A
I _{GSS}	Gate-Source Leakage Current	V _{GS} = ± 20V, V _{DS} =0A	---	---	± 100	nA
On Characteristics						
V _{GS(th)}	GATE-Source Threshold Voltage ³	V _{GS} =V _{DS} , I _D =250 μ A	2	2.9	4	V
R _{DS(ON)}	Drain-Source On Resistance ³	V _{GS} =10V, I _D =20A	---	6.6	8	m Ω
G _{FS}	Forward Transconductance ³	V _{DS} =5V, I _D =20A	---	20	---	S
Dynamic Characteristics						
C _{iSS}	Input Capacitance ⁴	V _{DS} =25V, V _{GS} =0V, f=1MHz	---	6800	---	pF
C _{oSS}	Output Capacitance ⁴		---	353	---	
C _{rSS}	Reverse Transfer Capacitance ⁴		---	261	---	
Switching Characteristics						
t _{d(on)}	Turn-On Delay Time ⁴	V _{DD} =40V, R _{GEN} =15 Ω .V _{GS} =10V	---	18	---	ns
t _r	Rise Time ⁴		---	12	---	ns
t _{d(off)}	Turn-Off Delay Time ⁴		---	56	---	ns
t _f	Fall Time ⁴		---	15	---	ns
Q _g	Total Gate Charge ⁴	V _{GS} =10V, V _{DS} =40V, I _D =50A	---	109.3	---	nC
Q _{gs}	Gate-Source Charge ⁴		---	35.1	---	nC
Q _{gd}	Gate-Drain “Miller” Charge ⁴		---	25.8	---	nC
Drain-Source Diode Characteristics						
V _{SD}	Source-Drain Diode Forward Voltage ³	V _{GS} =0V, I _S =95A	---	---	1.2	V
I _S	Diode Forward Current ²	---	---	---	90	A
T _{rr}	Reverse Recovery Time	T _j =25℃, I _F =100A di/dt=100A/μs ^(Note3)	---	---	37	NS
Q _{rr}	Reverse Recovery Charge		---	---	58	NC

Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, $t \leq 10$ sec.
3. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.
4. Guaranteed by design, not subject to production
5. EAS condition: $T_J=25^{\circ}\text{C}, V_{DD}=40V, V_G=10V, L=0.5mH, R_g=25\Omega$



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Typical Characteristics: ($T_c=25^\circ\text{C}$ unless otherwise noted)

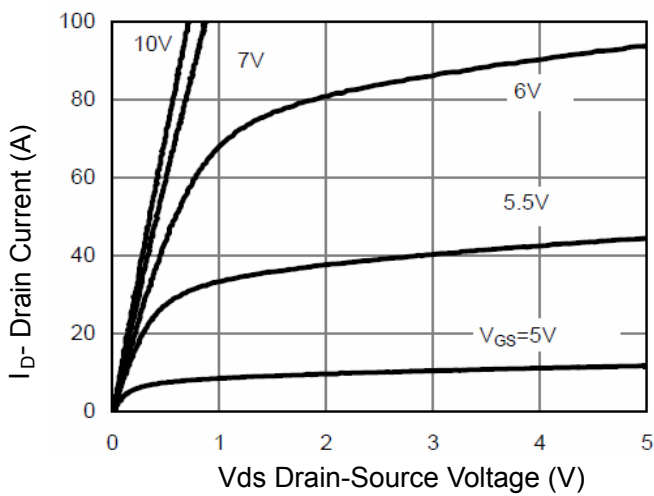


Figure 1 Output Characteristics

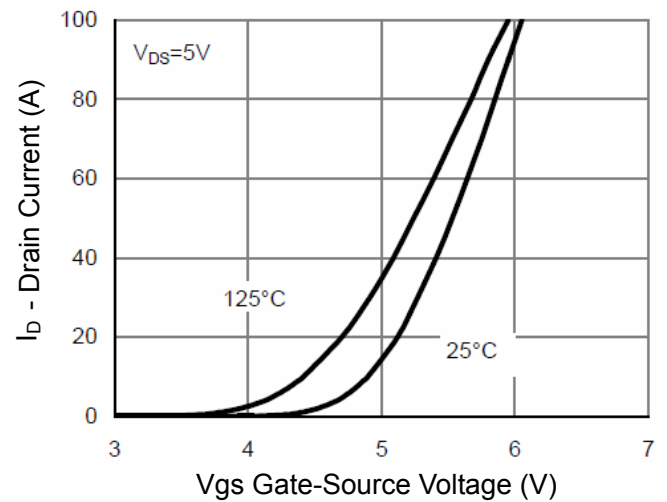


Figure 2 Transfer Characteristics

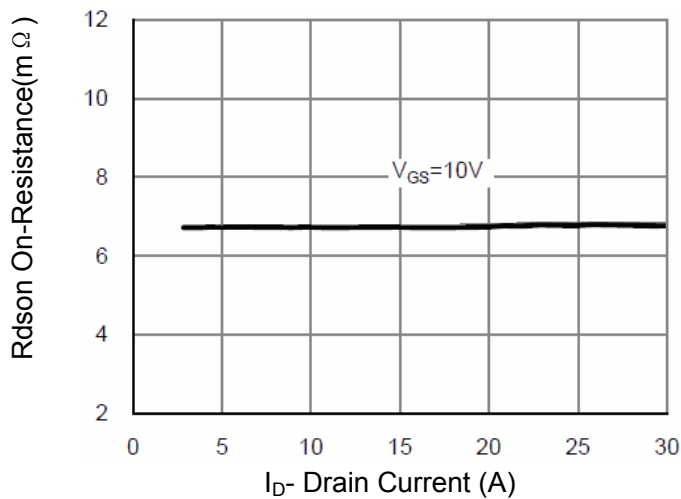


Figure 3 Rdson- Drain Current

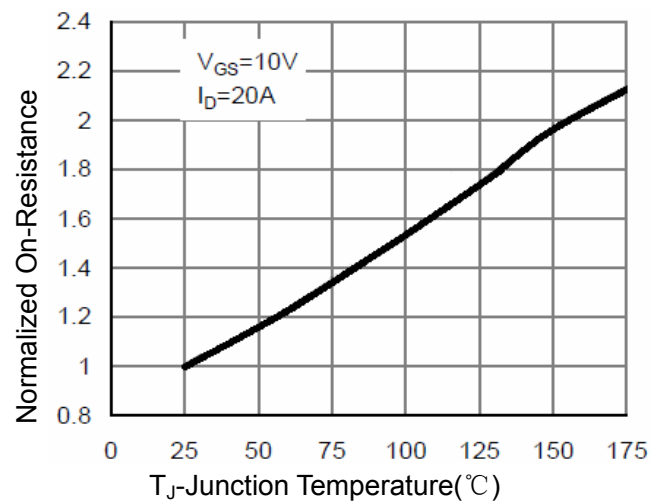


Figure 4 Rdson-Junction Temperature

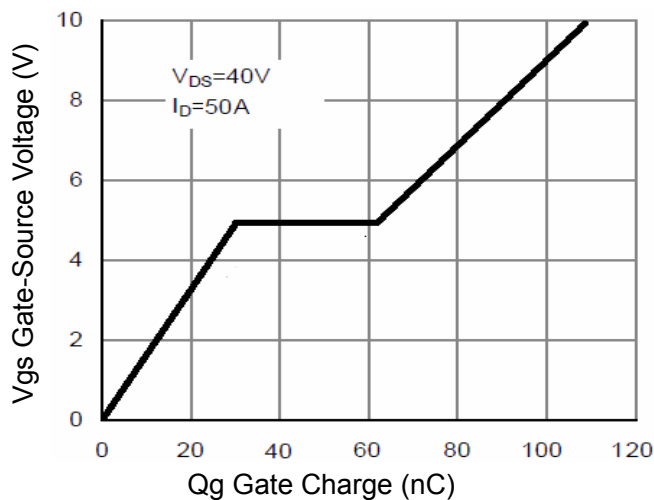


Figure 5 Gate Charge

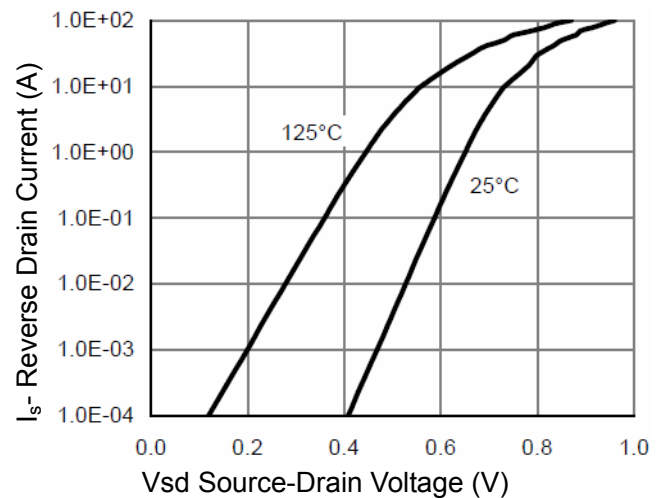


Figure 6 Source- Drain Diode Forward

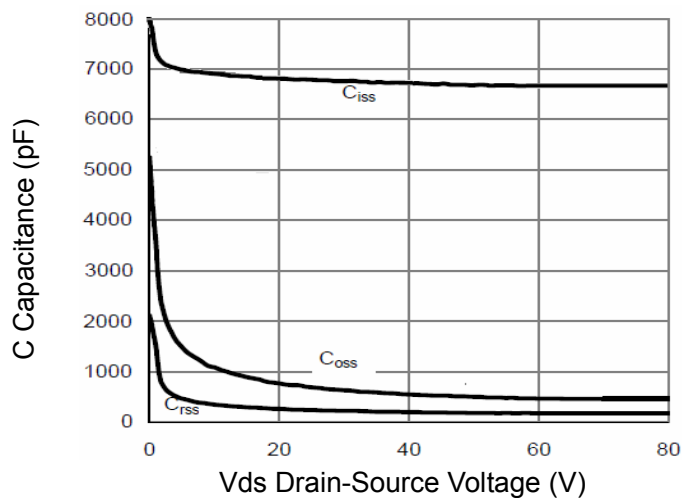


Figure 7 Capacitance vs Vds

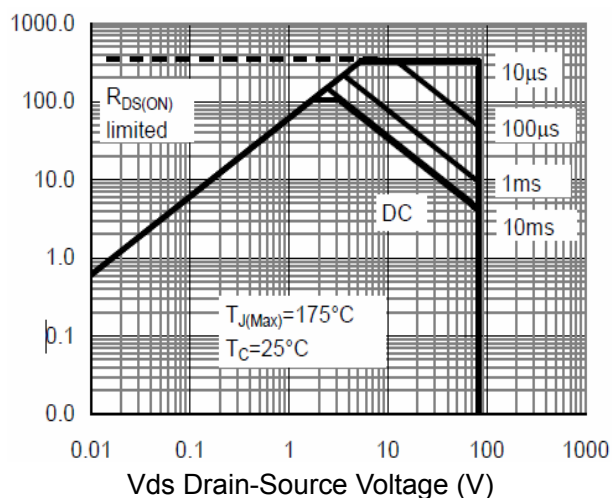


Figure 8 Safe Operation Area

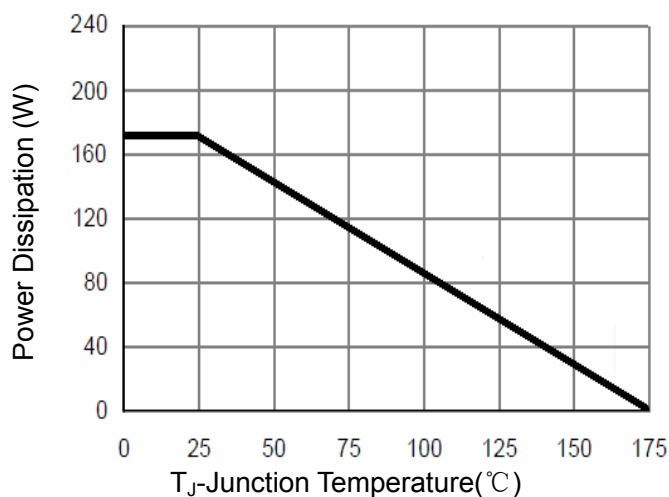


Figure 9 Power De-rating

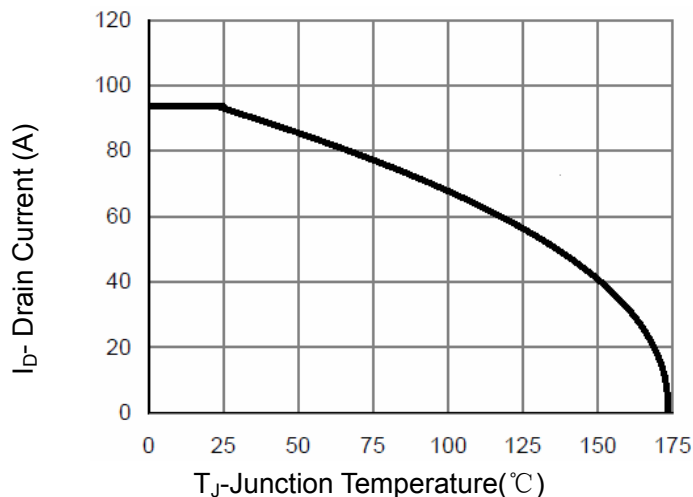


Figure 10 ID Current De-rating

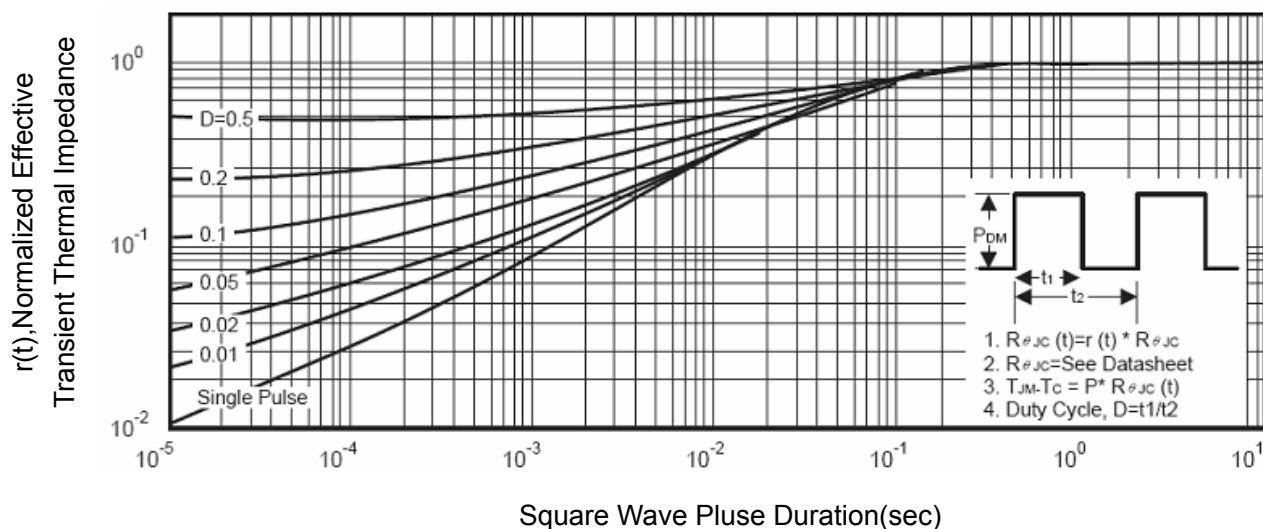
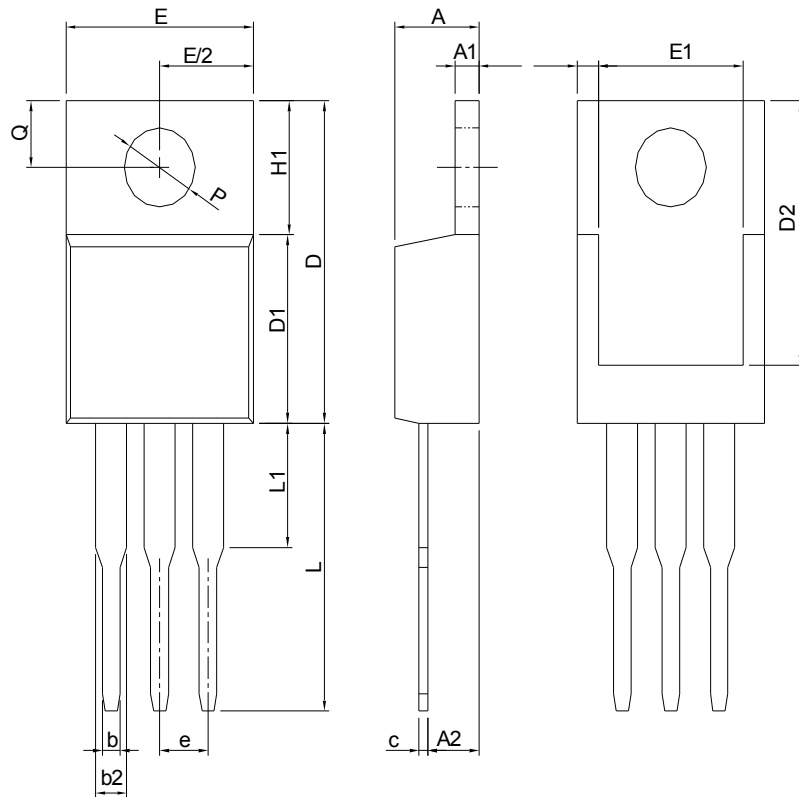


Figure 11 Normalized Maximum Transient Thermal Impedance

Package Information:TO-220AB



SYMBOL	TO-220			
	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	3.56	4.83	0.140	0.190
A1	0.51	1.40	0.020	0.055
A2	2.03	2.92	0.080	0.115
b	0.38	1.02	0.015	0.040
b2	1.14	1.78	0.045	0.070
c	0.36	0.61	0.014	0.024
D	14.22	16.51	0.560	0.650
D1	8.38	9.02	0.330	0.355
D2	12.19	13.65	0.480	0.537
E	9.65	10.67	0.380	0.420
E1	6.86	8.89	0.270	0.350
e	2.54 BSC		0.100 BSC	
H1	5.84	6.86	0.230	0.270
L	12.70	14.73	0.500	0.580
L1	-	6.35	-	0.250
P	3.53	4.09	0.139	0.161
Q	2.54	3.43	0.100	0.135

Note: Follow JEDEC TO-220 AB.

RECOMMENDED LAND PATTERN

