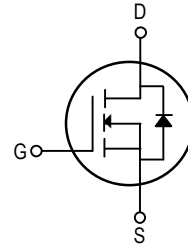




## 80V/90A N-Chnnel MOSFET

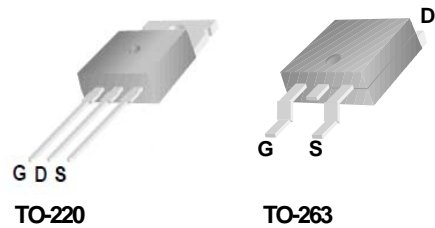
### Features

- 80V/90A  
RDS(ON)=6.5mΩ (typ.)@ VGS=10V
- Lead free and Green Device Available
- Low Rds-on to Minimize Conductive Loss
- High avalanche Current
- 100% Avalanche Tested



### Application

- Power Supply
- DC-DC Converters
- UPS
- Battery Manageme



### Order Information

Product	Package	Marking	Packing
PTP90N08	TO-220	PTP90N08	50PCS/Tube
PTY90N08	TO-263	PTY90N08	50PCS/Tube 800PCS/REF

### Absolute Maximum Ratings (T<sub>A</sub>=25°C unless otherwise noted)

Symbol	Parameter	Maximum	Unit
V <sub>DSS</sub>	Drain-to-Source Voltag	80	V
V <sub>GSS</sub>	Gate-to-Source	±25	V
I <sub>D</sub> <sup>3</sup>	Continuous Drain Current	90	A
I <sub>DM</sub> <sup>4</sup>	Pulsed Drain Current	360	A
EAS <sup>5</sup>	Avalanche energy	204.5	mJ
PD	Maximum Power Dissipation	180	W
T <sub>J</sub> , T <sub>STG</sub>	Junction & Storage Temperature Range	-55~150	°C

### Thermal Characteristics

Symbol	Parameter	Typical	Unit
Rθ <sub>jc</sub>	Thermal Resistance-Junction to Case	0.69	°C/W
Rθ <sub>ja</sub>	Thermal Resistance-Junction to Ambient	62.5	

**80V/90A N-Chnnel MOSFET****Electrical Characteristics** (TA=25°C unless otherwise noted)

Symbol	Parameter	Test Conditions	Min.	Typ	Max.	Unit
<b>Static Characteristics</b>						
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	80	—	—	V
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS}=80V, V_{GS}=0V$	—	—	1	$\mu A$
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	2	3	4	V
$I_{GSS}$	Gate Leakage Current	$V_{GS}=\pm 25V, V_{DS}=0V$	—	—	$\pm 100$	nA
$R_{DS(on)}^1$	Drain-Source On-Resistance	$V_{GS}=10V, I_D=40A$	—	6.5	8.5	m $\Omega$
			—	—	—	
<b>Diode Characteristics</b>						
$V_{SD}^1$	Diode Forward Voltage	$I_{SD}=50A, V_{GS}=0V$	—	0.9	1.3	V
$I_S^3$	Diode Continuous Forward Current		—	—	90	A
$t_{rr}$	Reverse Recovery Time	$I_S=50A,$	—	45	—	nS
$Q_{rr}$	Reverse Recovery Charge	$di/dt=100A/\mu s$	—	65	—	nC
<b>Dynamic Characteristics<sup>2</sup></b>						
$C_{iss}$	Input Capacitance	$V_{GS}=0V, V_{DS}=50V$ Frequency=1MHz	—	3175	—	pF
$C_{oss}$	Output Capacitance		—	440	—	
$C_{riss}$	Reverse Transfer Capacitance		—	268	—	
$t_{d(on)}$	Turn-On Delay Time	$V_{DS}=40V, I_D=50A,$ $V_{GS}=10V, (Note 1, 4)$	—	49	—	nS
$t_r$	Rise Time		—	64	—	
$t_{d(off)}$	Turn-Off Delay Time		—	139	—	
$t_f$	Fall Time		—	48	—	
<b>Gate Charge Characteristics<sup>2</sup></b>						
$Q_g$	Total Gate Charge	$V_{DS}=64V, I_D=50A,$ $V_{GS}=10V, (Note 1, 4)$	—	76	—	nC
$Q_{gs}$	Gate-to-Source Charge		—	21	—	
$Q_{gd}$	Gate-to-Drain Charge		—	24	—	

Note: 1: Pulse test; pulse width  $\leq 300\mu s$ , duty cycle  $\leq 2\%$ .

2: Guaranteed by design, not subject to production testing.

3: Package limitation current is 100A. Calculated continuous current based on maximum allowable junction temperature.

4: Repetitive rating, pulse width limited by max junction temperature.

5: Starting  $T_J = 25^\circ C, L = 0.5mH$



80V/90A N-Chnnel MOSFET  
Typical Characteristics

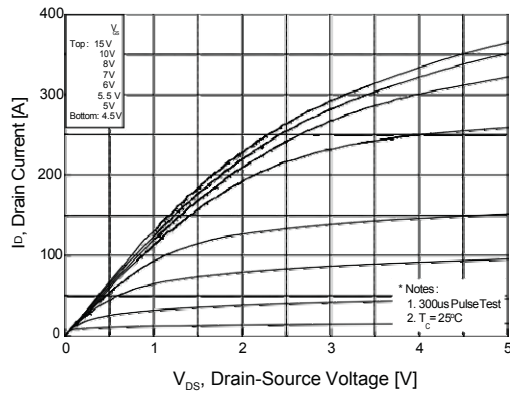


Figure 1. On Region Characteristics

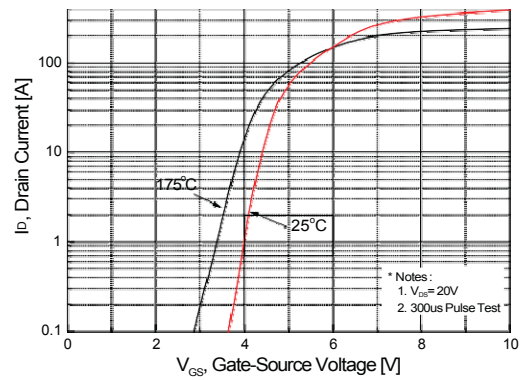


Figure 2. Transfer Characteristics

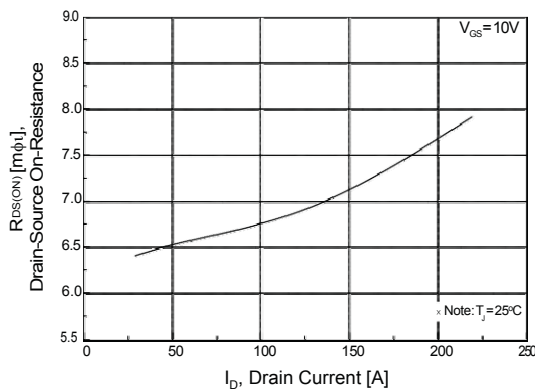


Figure 3. On Resistance Variation with Drain Current and Gate Voltage

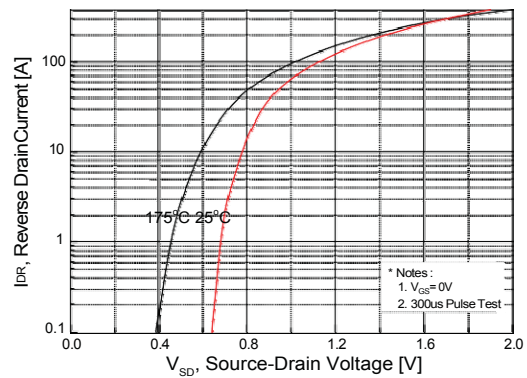


Figure 4. Body Diode Forward Voltage Variation with Source Current and Temperature

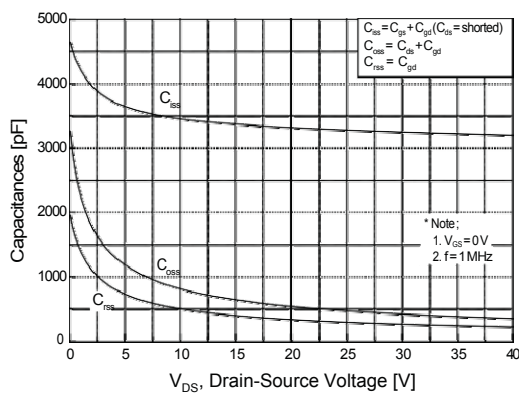


Figure 5. Capacitance Characteristics

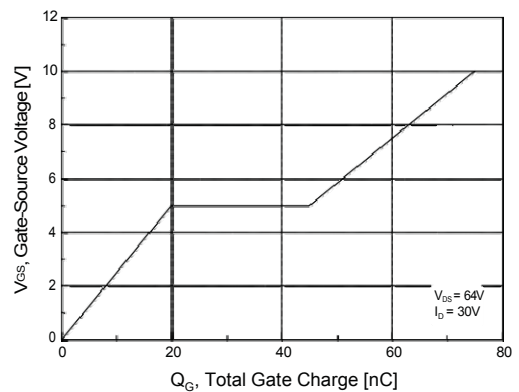


Figure 6. Gate Charge Characteristics



80V/90A N-Channel MOSFET

Typical Characteristics (continued)

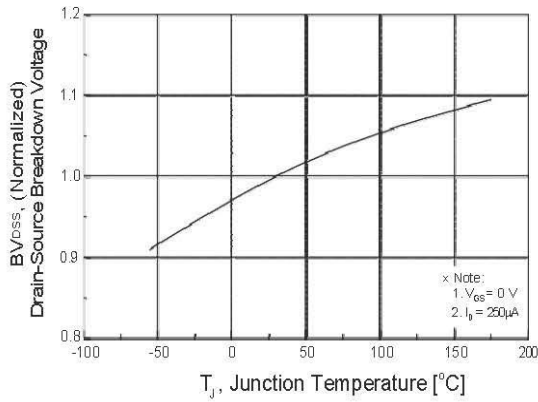


Figure 7. Breakdown Voltage Variation vs Temperature

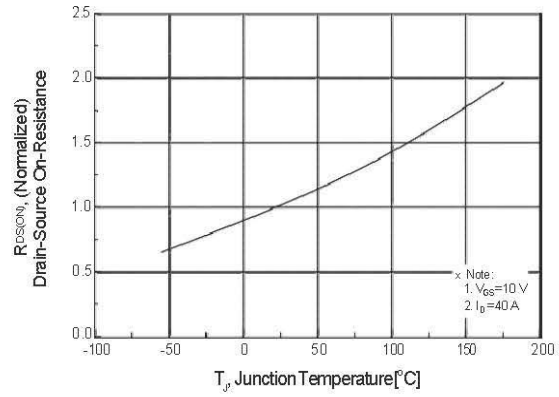


Figure 8. On-Resistance Variation vs Temperature

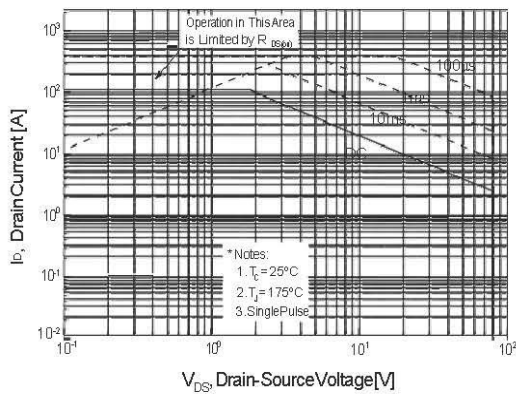


Figure 9. Maximum Safe Operating Area

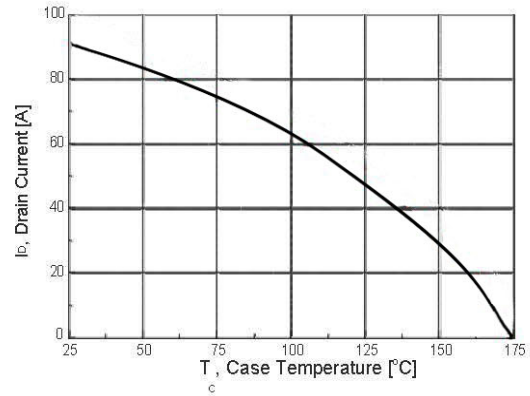


Figure 10. Maximum Drain Current vs Case Temperature

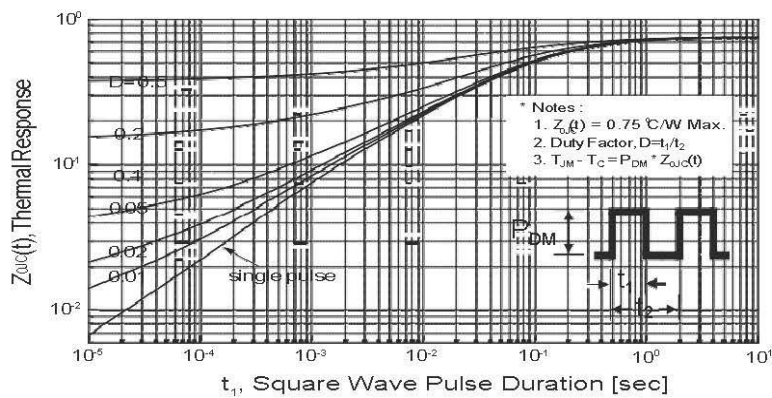


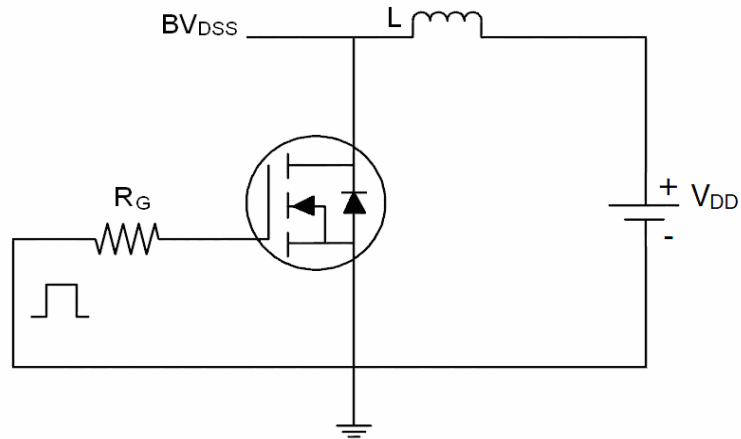
Figure 11. Transient Thermal Response Curve



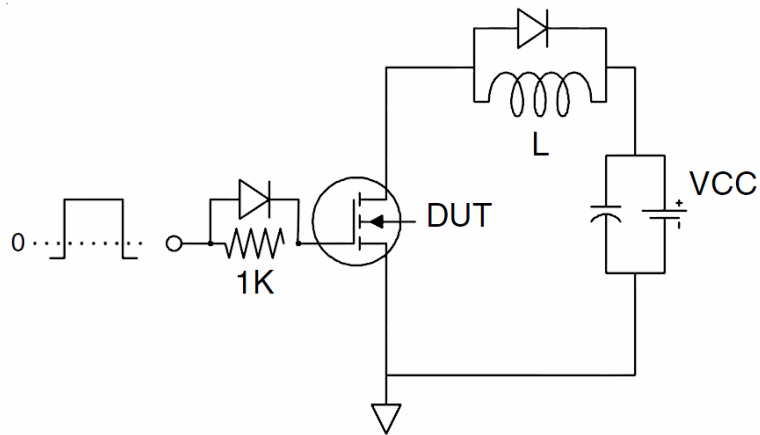
80V/90A N-Chnnel MOSFET

Test Circuit

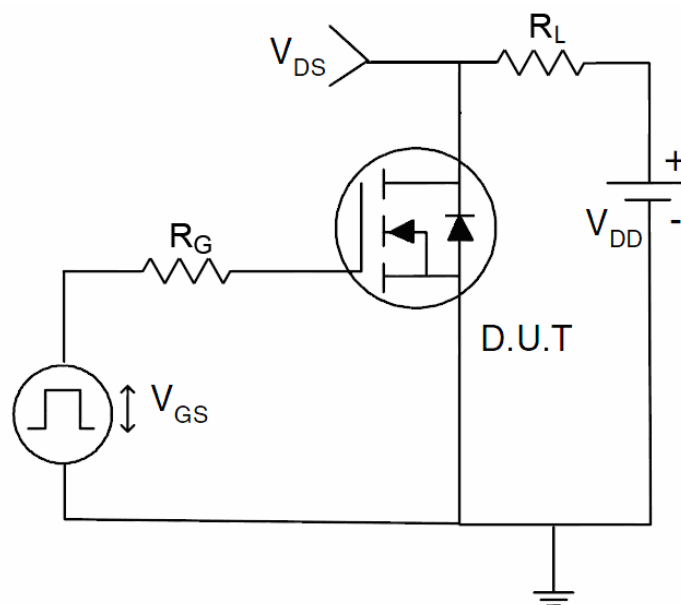
1)  $E_{AS}$  test Circuit



2) Gate charge test Circuit



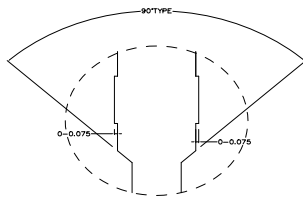
3) Switch Time Test Circuit



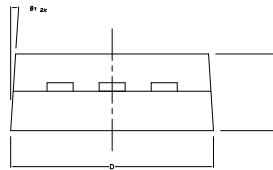


80V/90A N-Chnnel MOSFET

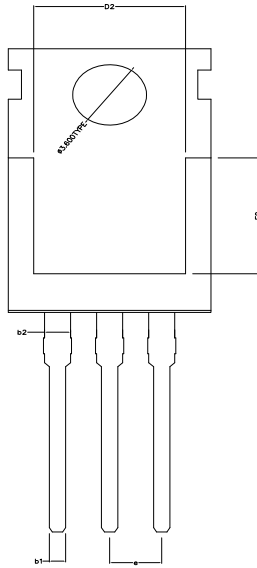
TO-220Package Outline Dimensions (Units: mm)



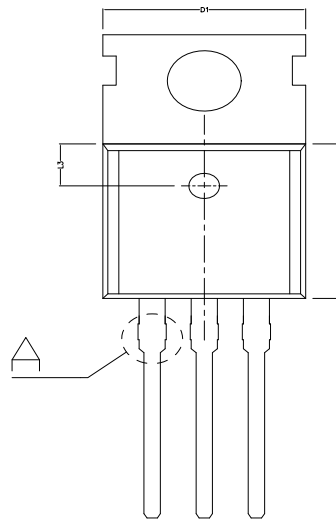
DETAIL A



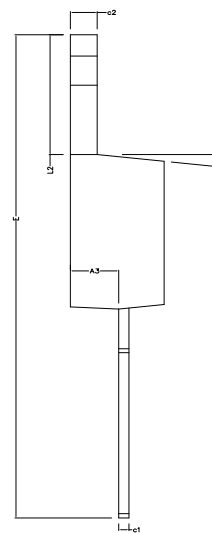
SIDE VIEW



BOTTOM VIEW



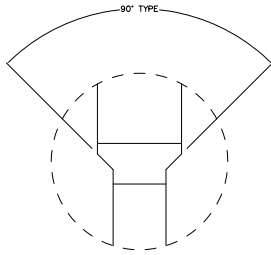
TOP VIEW



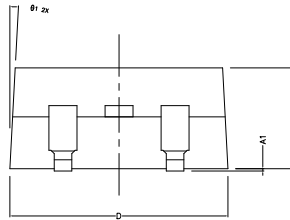
COMMON DIMENSIONS (UNITS OF MEASURE IS mm)			
	MIN	NORMAL	MAX
A2	4.470	4.570	4.670
A3	2.300	2.350	2.400
b1	0.750	0.800	0.850
b2	1.27 TYPE		
c1	0.450	0.500	0.550
c2	1.250	1.300	1.380
D	9.900	10.000	10.100
D1	10.000TYPE		
D2	8.000TYPE		
E	28.660	28.860	29.060
E1	9.000	9.100	9.200
E2	7.000TYPE		
e	2.540TYPE		
L2	6.350	6.500	6.650
L3	2.50TYPE		
theta 1	3° TYPE		
theta 2	3° TYPE		
theta 3	7° TYPE		
theta 4	7° TYPE		



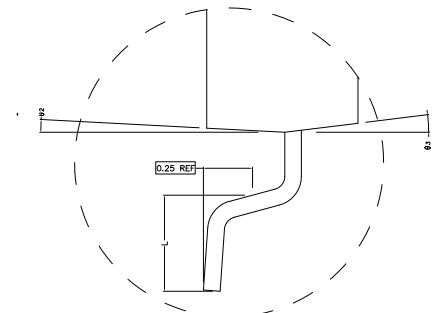
80V/90A N-Chnnel MOSFET  
TO-263 Package Outline Dimensions (Units: mm)



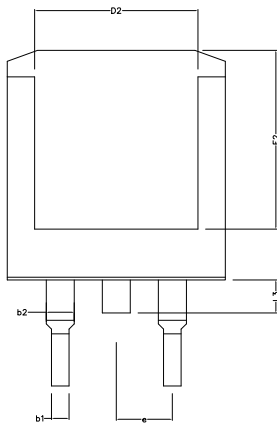
DETAIL F



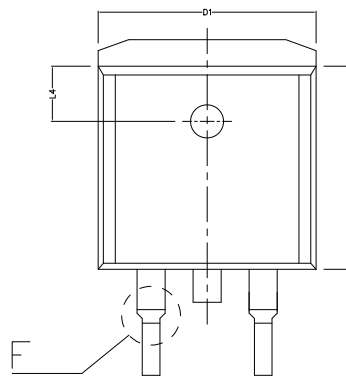
SIDE VIEW



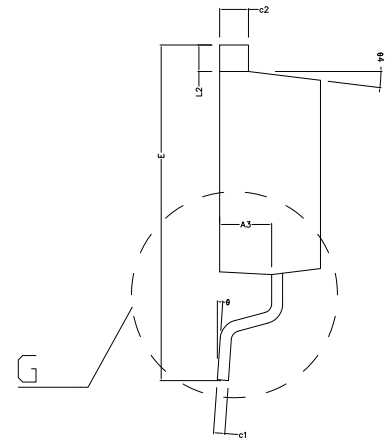
DETAIL G



BOTTOM VIEW



TOP VIEW



SIDE VIEW

COMMON DIMENSIONS (UNITS OF MEASURE IS mm)			
	MIN	NORMAL	MAX
A1	0.020	0.100	0.200
A2	4.470	4.570	4.670
A3	2.300	2.350	2.400
b1	0.750	0.800	0.850
b2	1.220	1.270	1.320
c1	0.450	0.500	0.550
c2	1.250	1.300	1.350
D	9.900	10.000	10.100
D1	9.880REF		
D2	7.400REF		
E	14.900	15.100	15.300
E1	9.000	9.100	9.200
E2	8.100REF		
e	2.540TYPE		
L	2.100	2.300	2.500
L2	1.100	1.200	1.300
L3	1.300	1.500	1.700
L4	2.50 TYPE		
θ1	3° TYPE		
θ2	3° TYPE		
θ3	7° TYPE		
θ4	7° TYPE		
θ	0 ~ 8°		