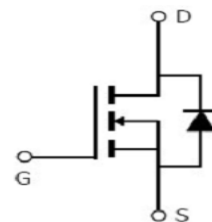




600V/4A N-Channel Advanced Power MOSFET

Features

- $R_{DS(on)}$ (Typical 2.6Ω)@ $V_{GS}=10V$
- Improved dv/dt Capability, High Ruggedness
- 100% Avalanche Tested
- Maximum Junction Temperature Range ($150^{\circ}C$)



Order Information

Product	Package	Marking	Packing
PTF4N60	TO-220F	PTF4N60	50PCS/Tube
PTP4N60	TO-220	PTP4N60	50PCS/Tube



Absolute Maximum Ratings

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

Symbol	Parameter		Rating		Unit
			TO-220	TO-220F	
Common Ratings (T _J =25°C Unless Otherwise Noted)					
V _{GS}	Gate-Source Voltage		±30		V
V _{(BR)DSS}	Drain-Source Breakdown Voltage		600		V
T _J	Maximum Junction Temperature		150		°C
T _{STG}	Storage Temperature Range		-50 to + 150		°C
I _S	Diode Continuous Forward Current		4		A
Mounted on Large Heat Sink (T _J =25°C Unless Otherwise Noted)					
I _{DM}	Pulse Drain Current Tested (Sillicon Limit) (Note1)		16		A
I _D	Continuous Drain current@V _{GS} =10V	T _C =25°C	4		A
P _D	Maximum Power Dissipation		109	39	W
E _{AS}	Sing Pulsed Avalanche Energy (Note2)		200	200	mJ
R _{θJC}	Thermal Resistance Junction-to-Case		1.15	3.2	°C/W
R _{θJA}	Thermal Resistance Junction-to-Ambient		65	65	°C/W

Note :

1. Repetitive Rating:Pulse width limited by maximum junction temperature.
2. $I_L=25mH, I_{AS}=4 A, V_{DD}=50V, R_G=25\Omega, T_J=25^{\circ}C$



Symbol	Parameter	Condition	Min.	Typ.	Max.	Unit
Static Electrical Characteristics @ T _J = 25°C (unless otherwise stated)						
V _{(BR)DSS}	Drain-Source Breakdown Voltage	VGS=0V ID=250μA	600	--	--	V
I _{DSS}	Zero Gate Voltage Drain current(Tc=25°C)	VDS=600V,VGS=0V	--	--	1	μA
I _{GSS}	Gate-Body Leakage Current	VGS=±30V,VDS=0V	--		±100	nA
V _{GS(TH)}	Gate Threshold Voltage	VDS=VGS,ID=250μA	2	3	4	V
R _{DS(ON)}	Drain-Source On-State Resistance note A	VGS=10V,ID=2A	--	2.6	3.0	Ω
Dynamic Electrical Characteristics @ T _J = 25°C (unless otherwise stated) ^{note B}						
C _{iss}	Input Capacitance	VDS=25V,VGS=0V, f=1MHz	--	550	--	pF
C _{oss}	Output Capacitance		--	46	--	pF
C _{rss}	Reverse Transfer Capacitance		--	2.3	--	pF
Q _g	Total Gate Charge	VDS=480V,ID=4A VGS=10V	--	10.2	--	nC
Q _{gs}	Gate-Source Charge		--	2.3	--	nC
Q _{gd}	Gate-Drain Charge		--	2.1	--	nC
Switching Characteristics ^{note B}						
t _{d(on)}	Turn-on Delay Time	VDS=300V ID=4A, RG=25Ω VGS=10V	--	15.5	--	nS
t _r	Turn-on Rise Time		--	13	--	nS
t _{d(off)}	Turn-Off Delay Time		--	40	--	nS
t _f	Turn-Off Fall Time		--	16	--	nS
Source- Drain Diode Characteristics@ T _J = 25°C (unless otherwise stated)						
V _{SD}	Forward on voltage	IS= 4 A,VGS=0V	--	0.8	1.4	V

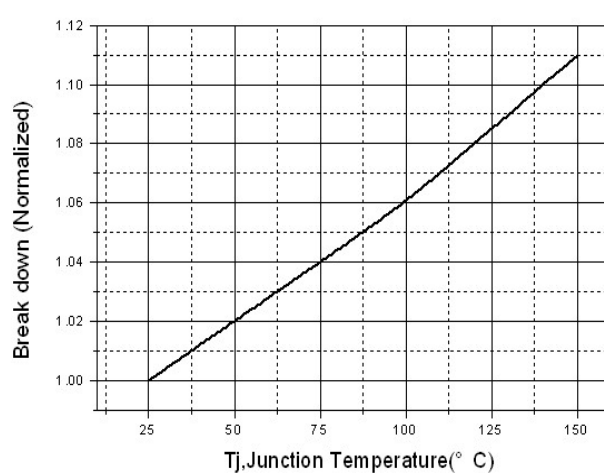
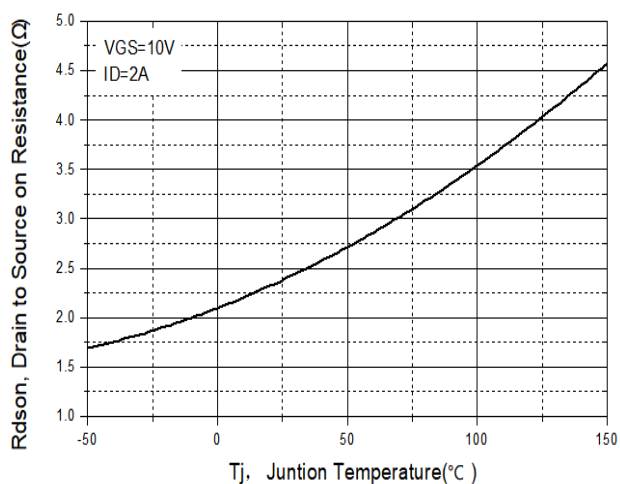
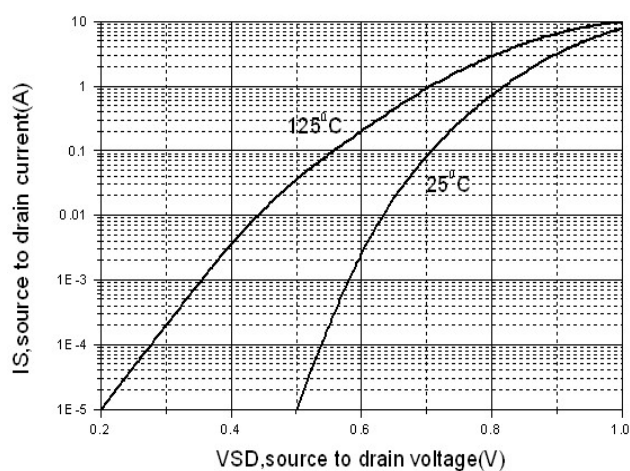
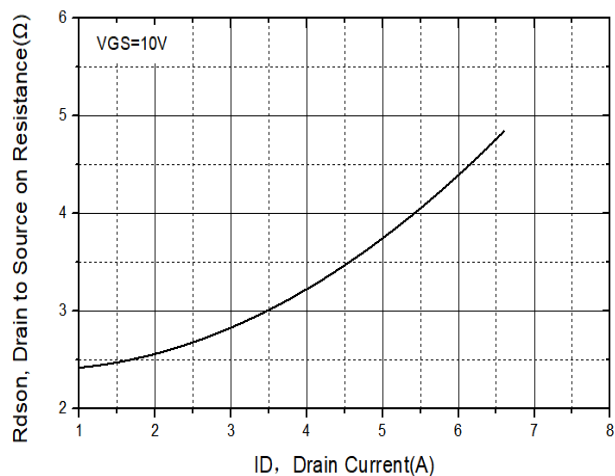
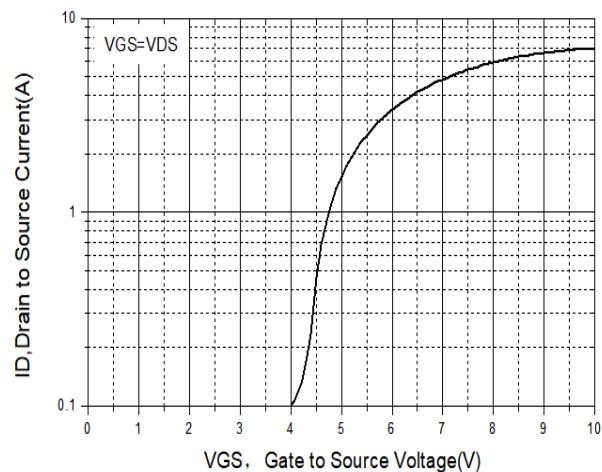
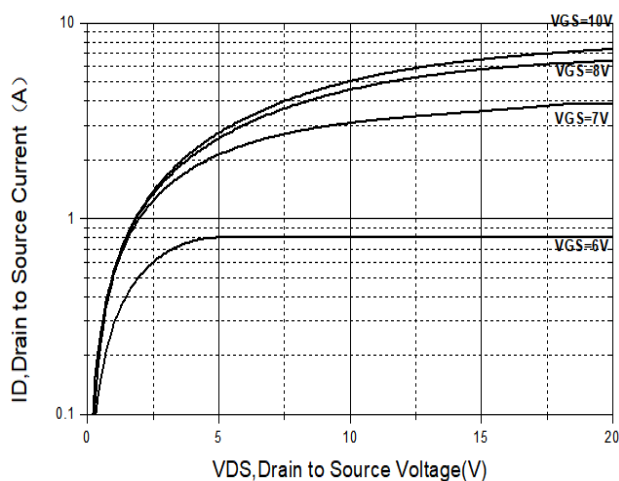
Note:

A: Pulse Test: pulse width ≤ 300 us, duty cycle ≤ 2%

B:Guranteed by design, not subject to production testing.



Typical characteristic curve:



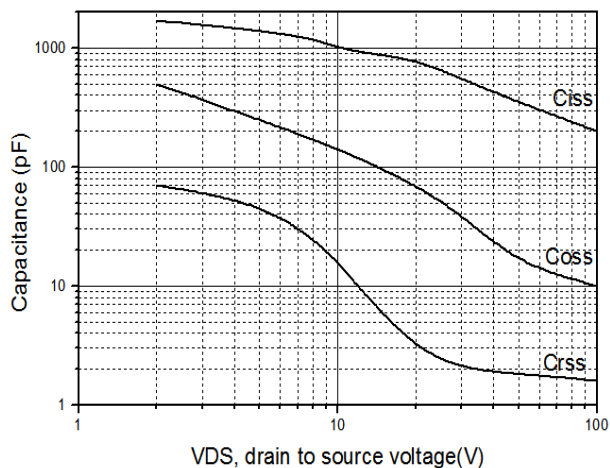


图 7: 电容特性

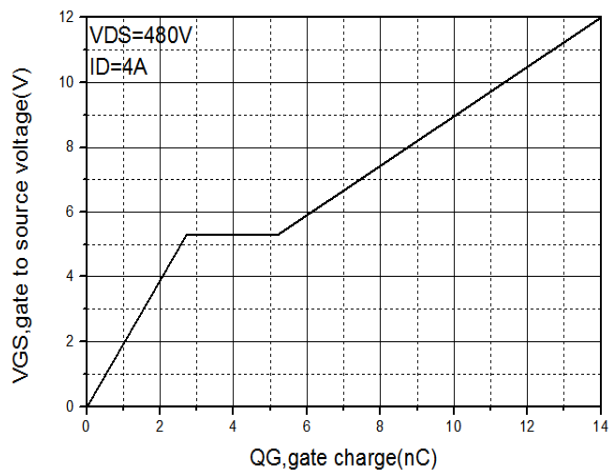


图 8: 栅电荷特性

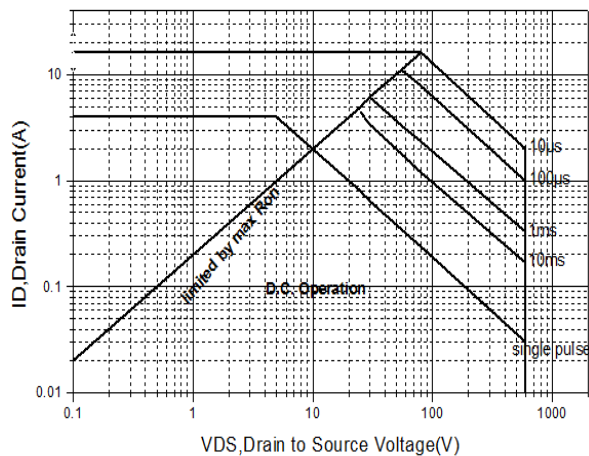


图 9: 安全工作区

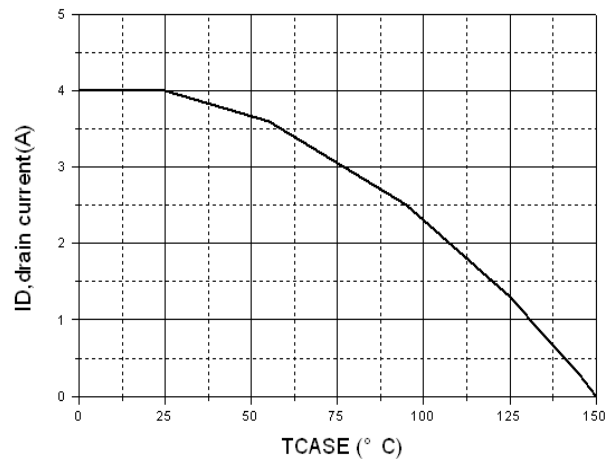
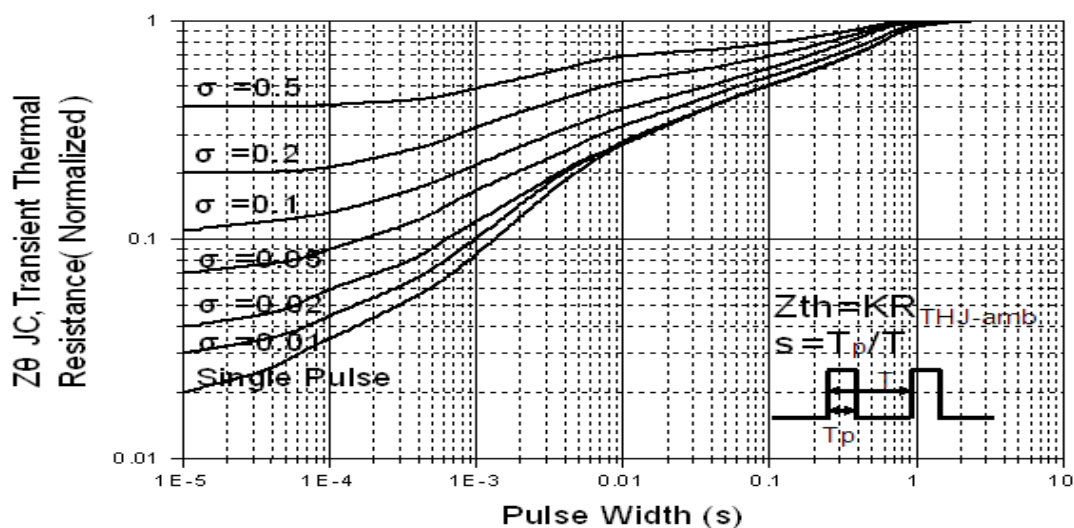
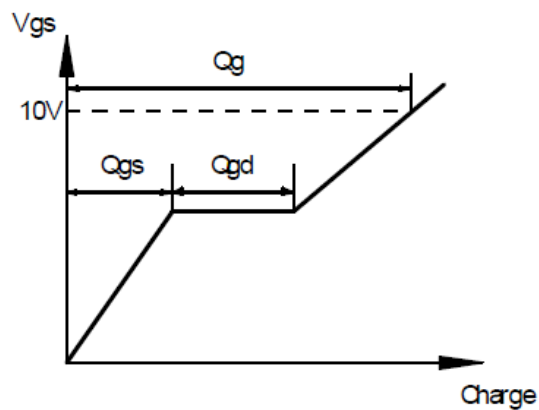
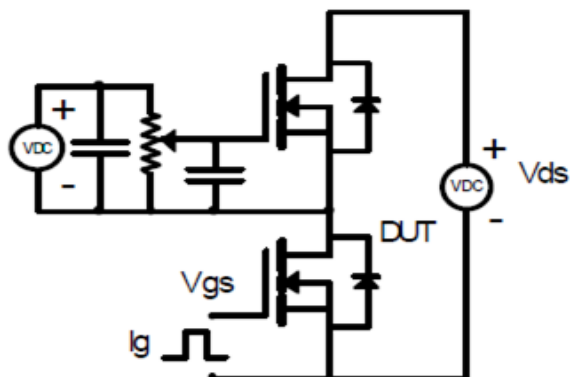
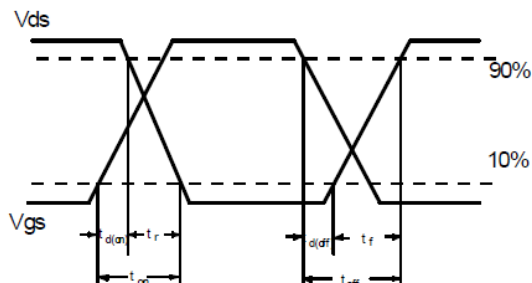
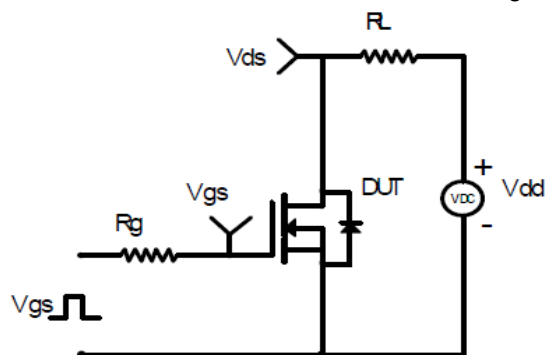
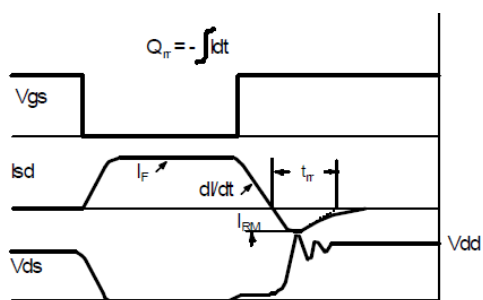
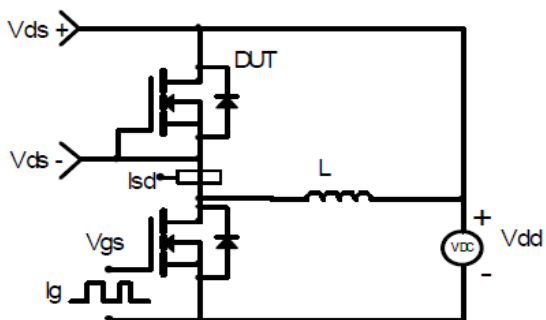
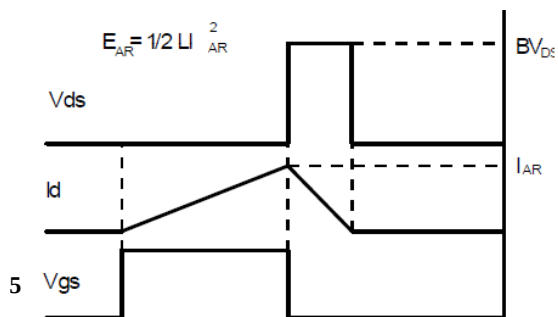
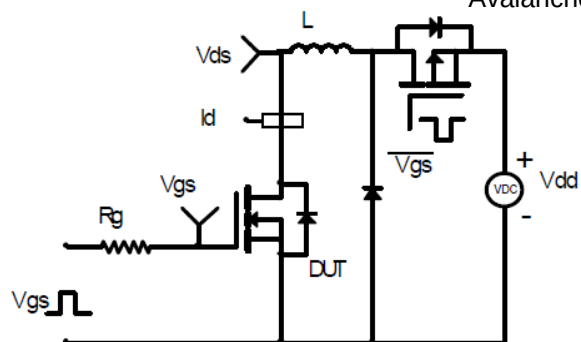


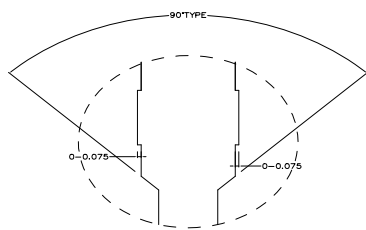
图 10: 最大电流衰减



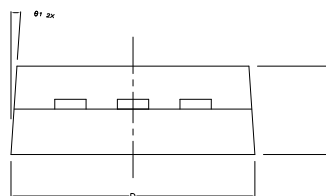
**Test Circuit and Waveform****Gate Charge Test Circuit and Waveform****Switching time test circuit and waveform****Reverse Recovery Test Circuit and Waveform****Avalanche Test Circuit and Waveform**



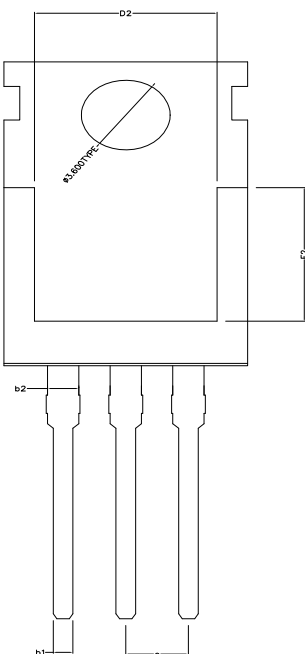
TO-220 Package Outline Dimensions (Units: mm)



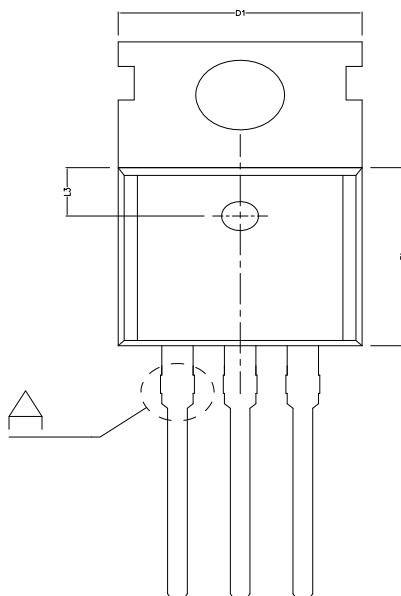
DETAIL A



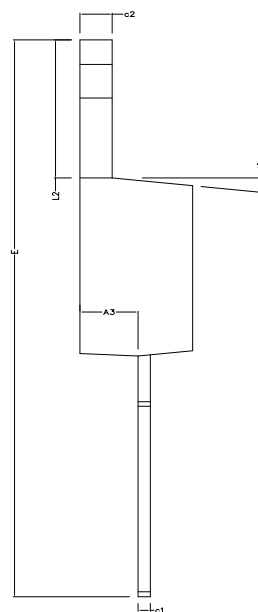
SIDE VIEW



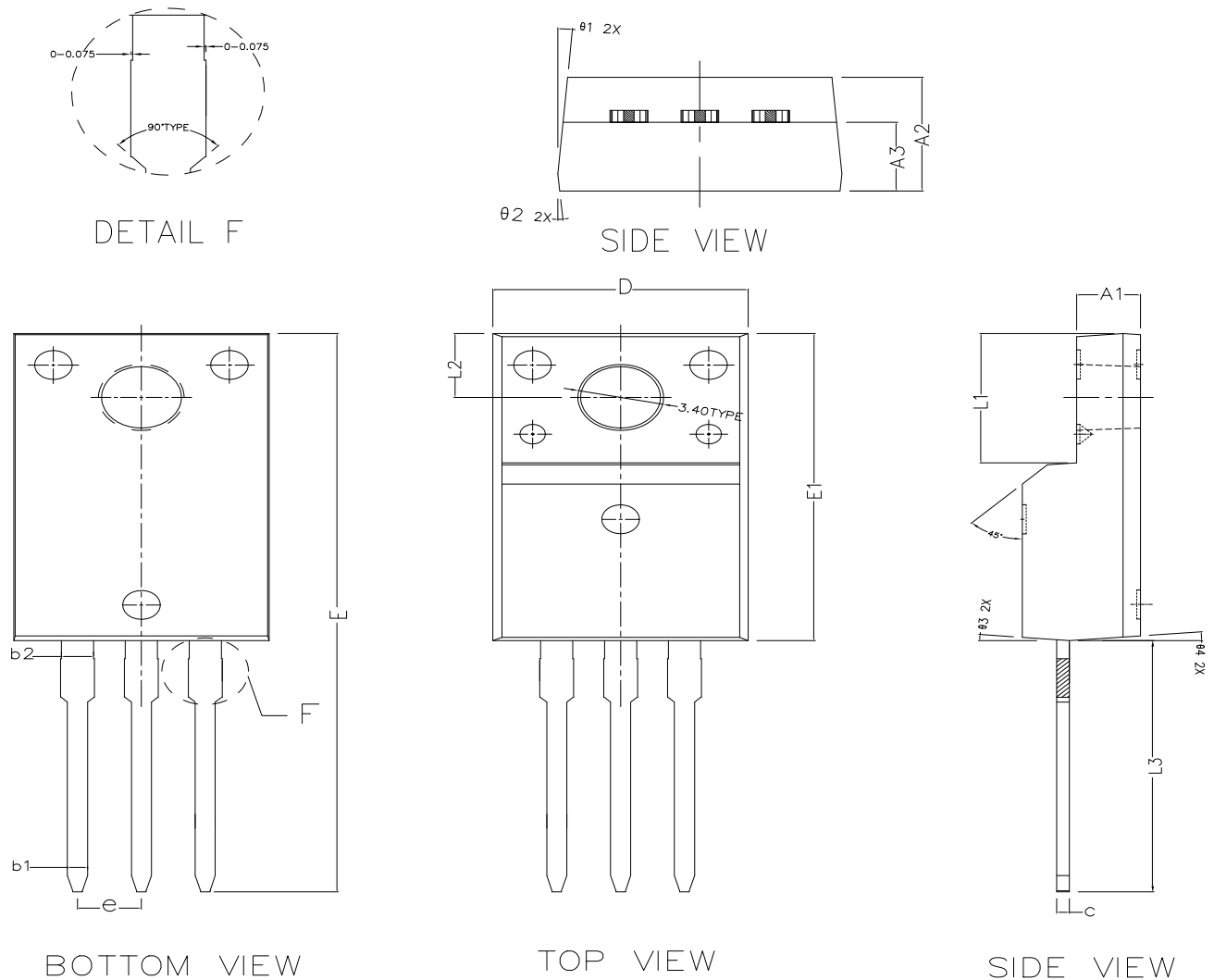
BOTTOM VIEW



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		
θ1	3° TYPE		
θ2	3° TYPE		
θ3	7° TYPE		
θ4	7° TYPE		

**TO-220F Package Outline Dimensions (Units: mm)**

COMMON DIMENSIONS (UNITS OF MEASURE IS mm)			
	MIN	NORMAL	MAX
A1	2.440	2.540	2.640
A2	4.600	4.700	4.800
A3	2.730	2.830	2.930
b1	0.750	0.800	0.850
b2	1.230	1.280	1.330
c	0.450	0.500	0.550
D	10.060	10.160	10.260
E	28.650	28.850	29.050
E1	15.770	15.870	15.970
e	2.54 TYPE		
L1	6.68 REF		
L2	3.30 REF		
L3	12.830	12.980	13.130
$\theta 1$	5° TYPE		
$\theta 2$	5° TYPE		
$\theta 3$	5° TYPE		
$\theta 4$	5° TYPE		