





芯基物科技

# MPSA60M940, MPSP60M940, MPSU60M940, MPST60M940

Specifications $T_J = 25^\circ\text{C}$ , unless otherwise noted						
Parameter	Symbol	Test Conditions	Value			Unit
			Min.	Typ.	Max.	
<b>Static</b>						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 250\mu A$	600	--	--	V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = 600V, V_{GS} = 0V, T_J = 25^\circ\text{C}$	--	--	1	$\mu A$
		$V_{DS} = 600V, V_{GS} = 0V, T_J = 150^\circ\text{C}$	--	--	100	
Gate-Source Leakage	$I_{GSS}$	$V_{GS} = \pm 30V$	--	--	$\pm 100$	nA
Gate-Source Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 0.25mA$	2.5	--	4.5	V
Drain-Source On-Resistance (Note3)	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 2A$	--	0.84	0.94	$\Omega$
Gate Resistance	$R_G$	$f = 1.0MHz, \text{open drain}$	--	14	--	$\Omega$
<b>Dynamic</b>						
Input Capacitance	$C_{iss}$	$V_{GS} = 0V, V_{DS} = 100V, f = 1.0MHz$	--	306	--	$\mu F$
Output Capacitance	$C_{oss}$		--	12	--	
Reverse Transfer Capacitance	$C_{rss}$		--	2	--	
Total Gate Charge	$Q_g$	$V_{DD} = 400V, I_D = 4A, V_{GS} = 10V$	--	8.8	--	nC
Gate-Source Charge	$Q_{gs}$		--	1.5	--	
Gate-Drain Charge	$Q_{gd}$		--	4.2	--	
Turn-on Delay Time	$t_{d(on)}$	$V_{DD} = 400V, I_D = 4A, V_{GS} = 10V, R_G = 25\Omega$	--	36	--	ns
Turn-on Rise Time	$t_r$		--	27	--	
Turn-off Delay Time	$t_{d(off)}$		--	80	--	
Turn-off Fall Time	$t_f$		--	25	--	
<b>Drain-Source Body Diode Characteristics</b>						
Continuous Body Diode Current	$I_S$	$T_C = 25^\circ\text{C}$	--	--	4	A
Pulsed Diode Forward Current	$I_{SM}$		--	--	8	
Body Diode Voltage	$V_{SD}$	$T_J = 25^\circ\text{C}, I_{SD} = 4A, V_{GS} = 0V$	--	0.9	1.2	V
Reverse Recovery Time	$t_{rr}$	$V_R = 400V, I_F = 4A, di_F/dt = 100A/\mu s$	--	240	--	ns
Reverse Recovery Charge	$Q_{rr}$		--	1.1	--	$\mu C$
Peak Reverse Recovery Current	$I_{rrm}$		--	9	--	A

**Notes**

1. Repetitive Rating: Pulse width limited by maximum junction temperature
2.  $I_{AS} = 2A, V_{DD} = 50V, R_G = 25\Omega, \text{Starting } T_J = 25^\circ\text{C}$
3. Pulse Test: Pulse width  $\leq 300\mu s, \text{Duty Cycle } \leq 1\%$

Typical Characteristics  $T_J = 25^\circ\text{C}$ , unless otherwise noted

Figure 1. Output Characteristics ( $T_J = 25^\circ\text{C}$ )

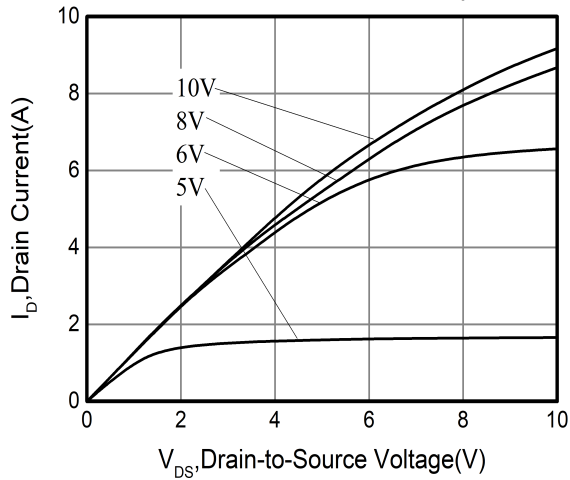


Figure 2. Transfer Characteristics

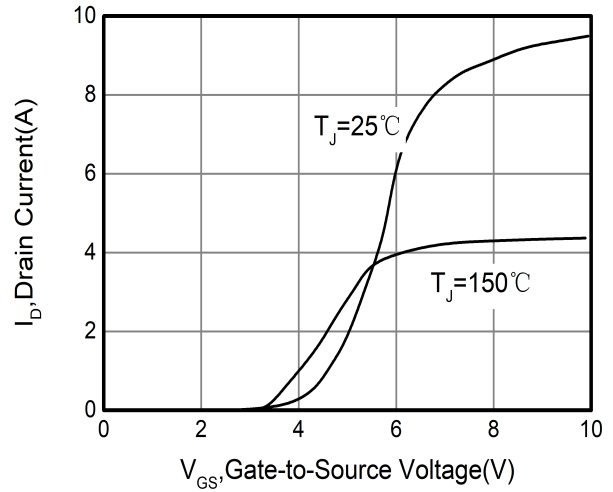


Figure 3. On-Resistance vs Drain Current

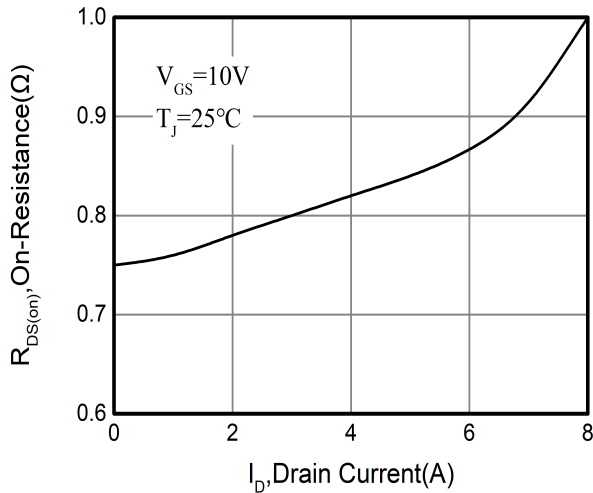


Figure 4. Capacitance

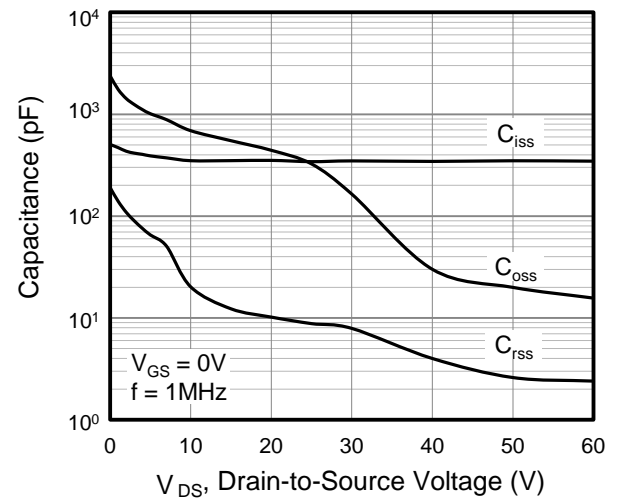


Figure 5. Gate Charge

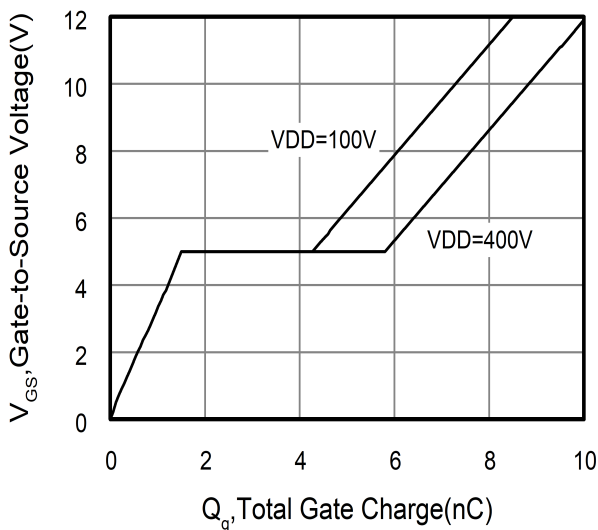
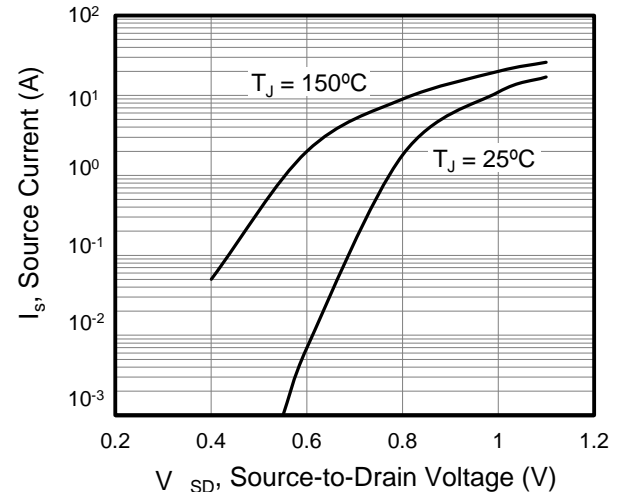


Figure 6. Body Diode Forward Voltage



Typical Characteristics  $T_J = 25^\circ\text{C}$ , unless otherwise noted

Figure 7. On-Resistance vs. Junction Temperature

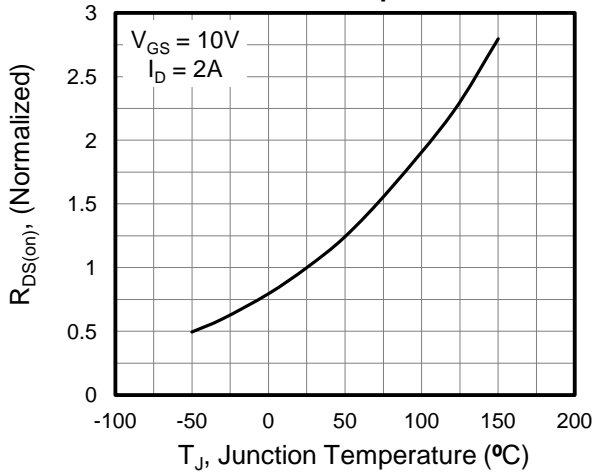


Figure 8. Threshold Voltage vs. Junction Temperature

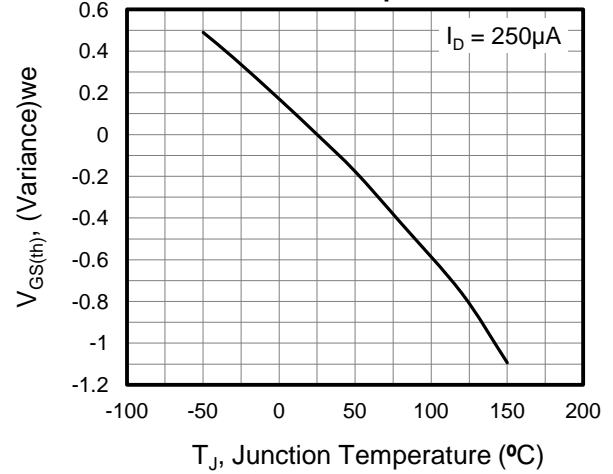


Figure 9. Transient Thermal Impedance TO-251, TO-252, TO-220

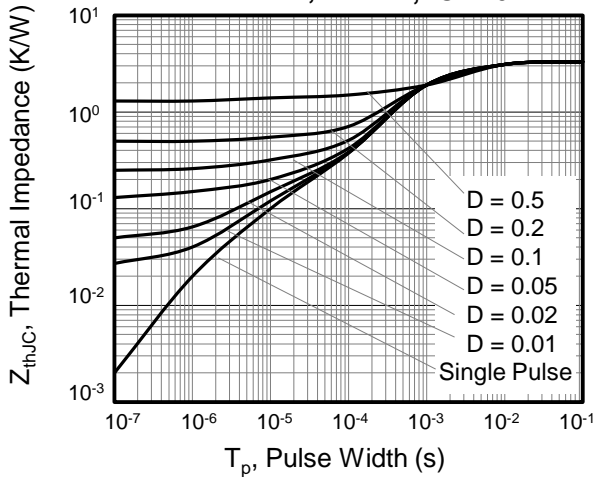


Figure 10. Transient Thermal Impedance TO-220F

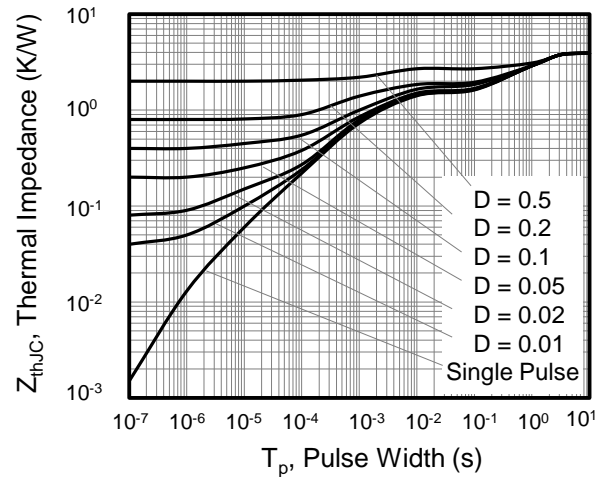


Figure A: Gate Charge Test Circuit and Waveform

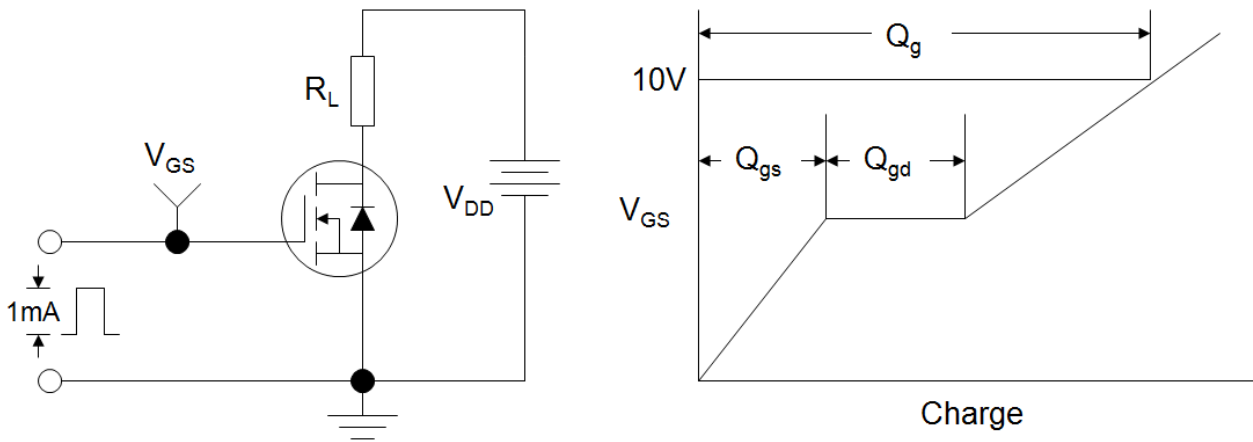


Figure B: Resistive Switching Test Circuit and Waveform

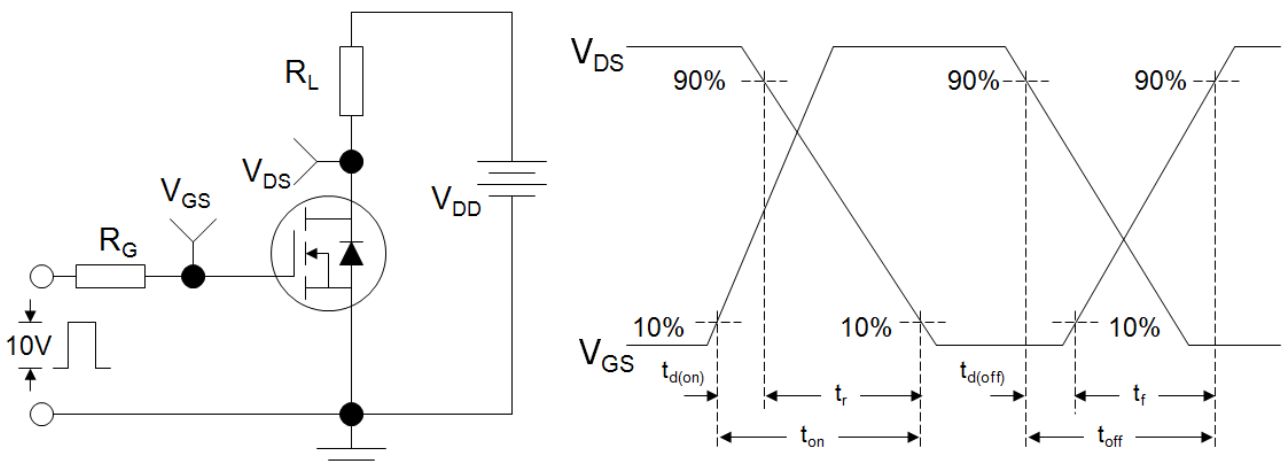
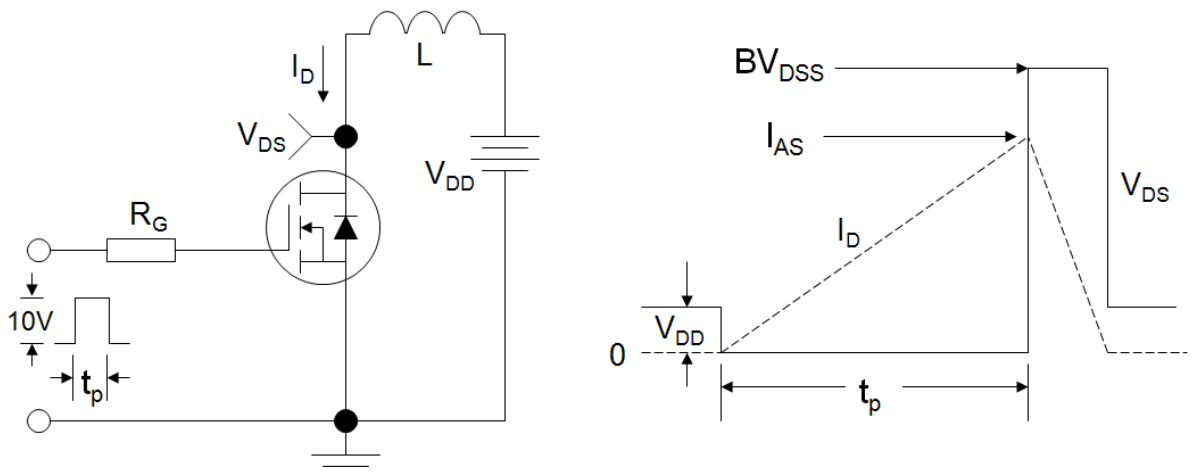
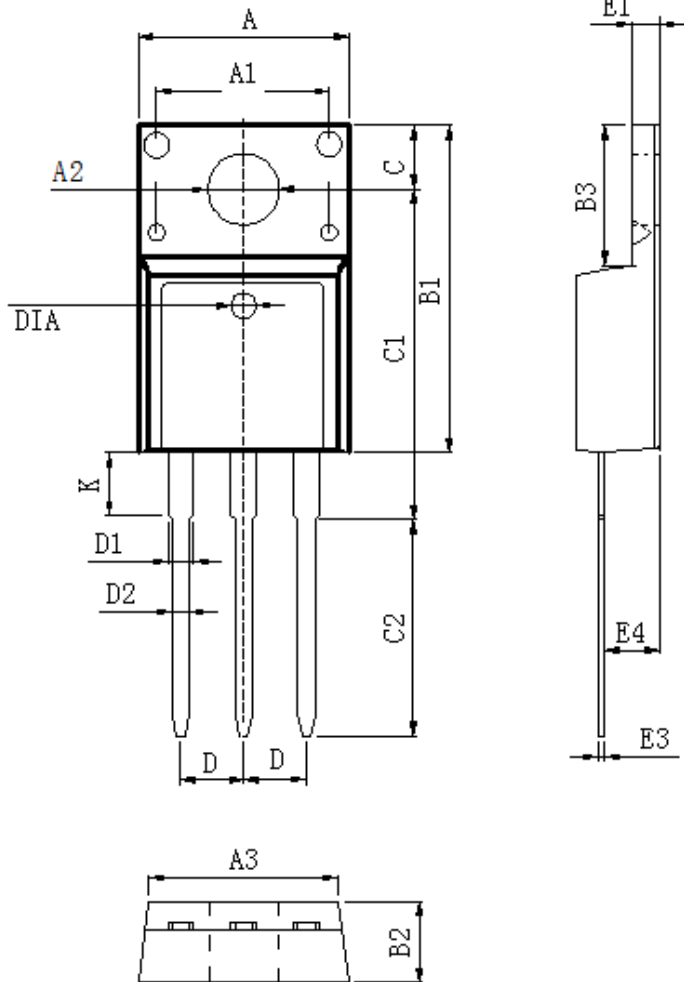


Figure C: Unclamped Inductive Switching Test Circuit and Waveform



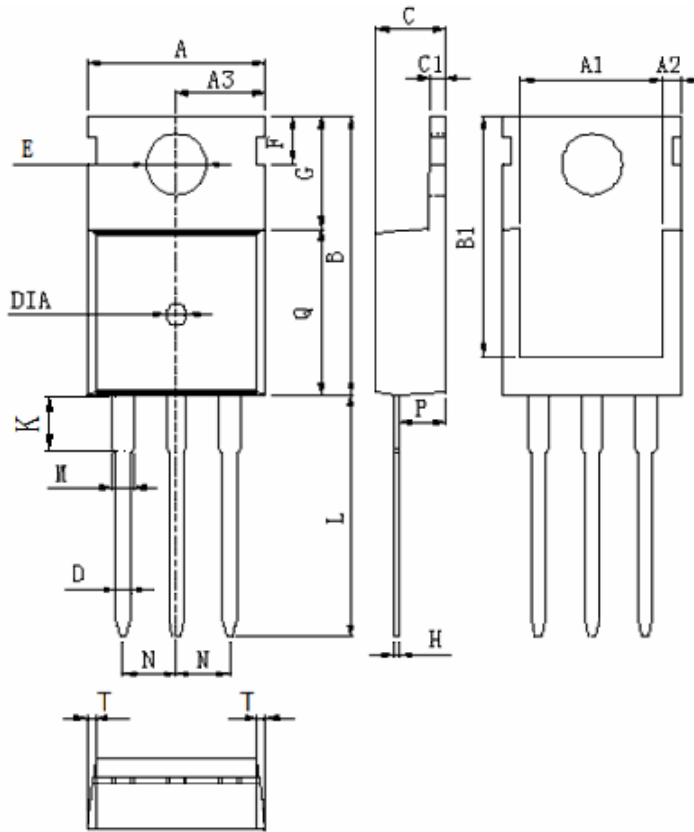
## TO-220F



DIM	MILLIMETERS
A	10.16±0.3
A1	7.00±0.1
A2	3.3±0.2
A3	9.5±0.2
B1	15.87±0.3
B2	4.7±0.2
B3	6.68±0.4
C	3.3±0.2
C1	12.57±0.3
C2	10.02±0.5
D	2.54±0.05
D1	1.28±0.2
D2	0.8±0.1
K	3.1±0.3
E1	2.54±0.1
E3	0.5±0.1
E4	2.76±0.2
DIA	⊙1.5 (deep 0.2)

Unit :mm

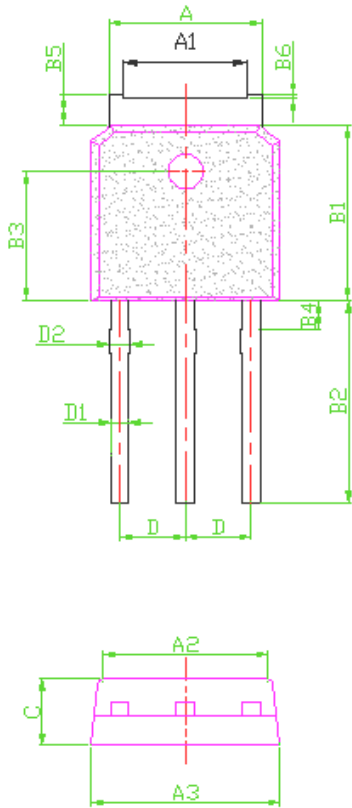
## TO-220



DIM	MILLIMETERS
A	$10.0 \pm 0.3$
A1	$8.64 \pm 0.2$
A2	$1.15 \pm 0.1$
A3	$5.0 \pm 0.2$
B	$15.8 \pm 0.4$
B1	$13.2 \pm 0.3$
C	$4.56 \pm 0.1$
C1	$1.3 \pm 0.2$
D	$0.8 \pm 0.2$
E	$3.6 \pm 0.2$
F	$2.95 \pm 0.3$
G	$6.5 \pm 0.3$
H	$0.5 \pm 0.1$
K	$3.1 \pm 0.2$
L	$13.2 \pm 0.4$
M	$1.25 \pm 0.1$
N	$2.54 \pm 0.1$
P	$2.4 \pm 0.3$
Q	$9.0 \pm 0.3$
T	W: 0.35
DIA	$\odot 1.5$ (deep 0.2)

Unit :mm

## TO-251

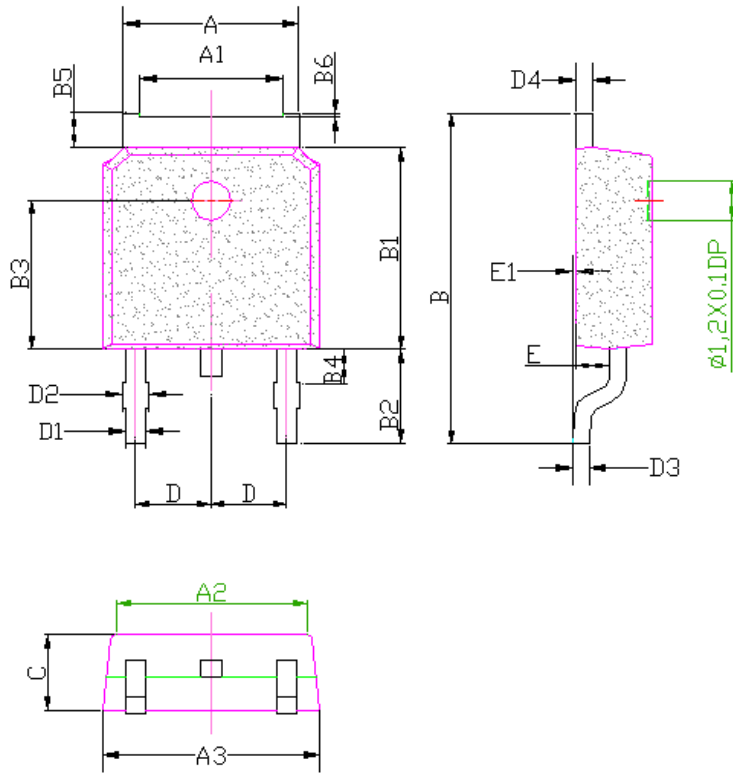


DIM	MILLIMETERS
A	$5.33 \pm 0.2$
A1	$4.33 \pm 0.2$
A2	$5.80 \pm 0.1$
A3	$6.6 \pm 0.2$
B	$14.15 \pm 0.5$
B1	$6.1 \pm 0.3$
B2	$7.0 \pm 0.5$
B3	$4.5 \pm 0.15$
B4	$1.0 \pm 0.1$
B5	$1.05 \pm 0.1$
B6	$0.1 \pm 0.05$
C	$2.3 \pm 0.2$
D	$2.286 \pm 0.05$
D1	$0.60 \pm 0.1$
D2	$0.72 \pm 0.12$
D3	$0.5 \pm 0.08$
D4	$0.5 \pm 0.08$
E	$1.01 \pm 0.2$
DIA	$\odot 1.2$ (deep 0.1)

Unit :mm



## TO-252



DIM	MILLIMETERS
A	f
A1	f
A2	f
A3	f
B	f
B1	f
B2	f
B3	f
B4	f
B5	f
B6	f
C	f
D	f
D1	f
D2	f
D3	f
D4	f
E	f
E1	f
DIA	4 GHHS

Unit :mm