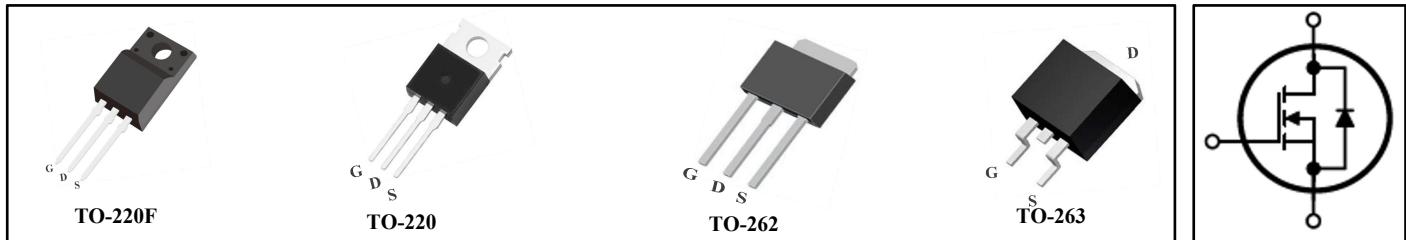


FEATURES

- BV_{DSS} : 600V, $I_D=12A$
- $R_{DS(on)}$: 0.75Ω(Max) @ $V_{GS}=10V$
- Very Low FOM ($R_{DS(on)} * Q_g$)
- Excellent stability and uniformity

APPLICATIONS

- Switch Mode Power Supply (SMPS)
- Uninterruptible Power Supply (UPS)
- Power Factor Correction (PFC)
- AC to DC Converters


Ordering Information

Type NO.	Marking	Package Code
MPVA12N60B	MPVA12N60B	TO-220F
MPVP12N60B	MPVP12N60B	TO-220
MPVH12N60B	MPVH12N60B	TO-262
MPVC12N60B	MPVC12N60B	TO-263

Absolute Maximum Ratings $T_C = 25^\circ C$, unless otherwise noted

Parameter	Symbol	Value		Unit
		220F	220-262-263	
Drain-Source Voltage ($V_{GS} = 0V$)	V_{DSS}	600		V
Continuous Drain Current	I_D	12		A
Pulsed Drain Current (note1)	I_{DM}	48		A
Gate-Source Voltage	V_{GSS}	± 30		V
Single Pulse Avalanche Energy (note2)	E_{AS}	810		mJ
Avalanche Current (note1)	I_{AR}	9		A
Repetitive Avalanche Energy (note1)	E_{AR}	54		mJ
Power Dissipation ($T_C = 25^\circ C$)	P_D	70	140	W
Operating Junction and Storage Temperature Range	T_J, T_{stg}	$-55\text{--}+150$		°C

Thermal Resistance

Parameter	Symbol	Value		Unit
		220F	220-262-263	
Thermal Resistance, Junction-to-Case	R_{thJC}	1.78	1.08	°C/W
Thermal Resistance, Junction-to-Ambient	R_{thJA}	62.5	60.0	



懋聲电源

MPVX12N60B Series

Power MOSFET

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

Parameter	Symbol	Test Conditions	Value			Unit
			Min.	Typ.	Max.	
Static						
Drain-Source Breakdown Voltage	$V_{(\text{BR})\text{DSS}}$	$V_{\text{GS}} = 0\text{V}, I_D = 250\mu\text{A}$	600	--	--	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{\text{DS}} = 600\text{V}, V_{\text{GS}} = 0\text{V}, T_J = 25^\circ\text{C}$	--	--	1	μA
Gate-Source Leakage	I_{GSS}	$V_{\text{GS}} = \pm 30\text{V}$	--	--	± 100	nA
Gate-Source Threshold Voltage	$V_{\text{GS}(\text{th})}$	$V_{\text{DS}} = V_{\text{GS}}, I_D = 250\mu\text{A}$	3.0	--	4.0	V
Drain-Source On-Resistance (Note4)	$R_{\text{DS}(\text{on})}$	$V_{\text{GS}} = 10\text{V}, I_D = 6.0\text{A}$	--	0.60	0.75	Ω
Dynamic						
Input Capacitance	C_{iss}	$V_{\text{GS}} = 0\text{V}, V_{\text{DS}} = 25\text{V}, f = 1.0\text{MHz}$	--	1722	--	pF
Output Capacitance	C_{oss}		--	142	--	
Reverse Transfer Capacitance	C_{rss}		--	11	--	
Total Gate Charge	Q_g	$V_{\text{DD}} = 480\text{V}, I_D = 12.0\text{A}, V_{\text{GS}} = 10\text{V}$	--	44	--	nC
Gate-Source Charge	Q_{gs}		--	8.6	--	
Gate-Drain Charge	Q_{gd}		--	21	--	
Turn-on Delay Time	$t_{\text{d}(\text{on})}$	$V_{\text{DD}} = 300\text{V}, I_D = 12.0\text{A}, R_G = 25\Omega$	--	30	--	ns
Turn-on Rise Time	t_r		--	12	--	
Turn-off Delay Time	$t_{\text{d}(\text{off})}$		--	95	--	
Turn-off Fall Time	t_f		--	22	--	
Drain-Source Body Diode Characteristics						
Continuous Body Diode Current	I_S	$T_C = 25^\circ\text{C}$	--	--	12	A
Pulsed Diode Forward Current	I_{SM}		--	--	48	
Body Diode Voltage	V_{SD}	$T_J = 25^\circ\text{C}, I_{\text{SD}} = 12.0\text{A}, V_{\text{GS}} = 0\text{V}$	--	--	1.4	V
Reverse Recovery Time	t_{rr}	$V_{\text{GS}} = 0\text{V}, I_F = 12.0\text{A}, \frac{di_F}{dt} = 100\text{A}/\mu\text{s}$	--	380	--	ns
Reverse Recovery Charge	Q_{rr}		--	4.5	--	μC

Notes

1. Repetitive Rating: Pulse width limited by maximum junction temperature
2. $I_{\text{AS}} = 9\text{A}, V_{\text{DD}} = 50\text{V}, R_G = 25\Omega$, Starting $T_J = 25^\circ\text{C}$
3. Pulse Test: Pulse width $\leq 300\mu\text{s}$, Duty Cycle $\leq 1\%$
4. Essentially independent of operating temperature

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

Figure 1. Output Characteristics

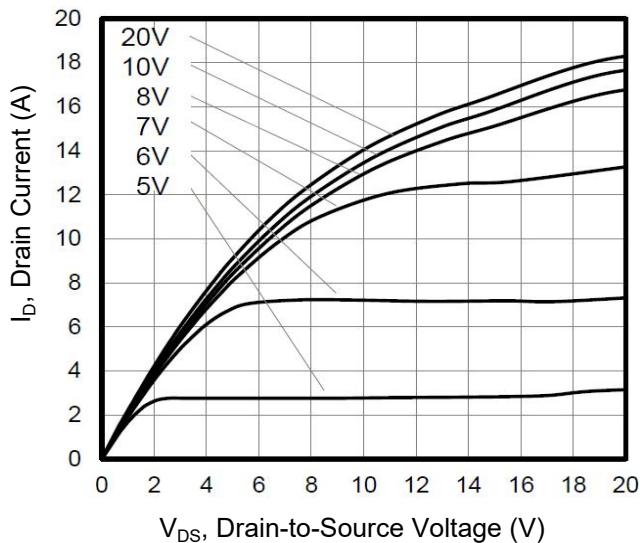


Figure 2. Transfer Characteristics

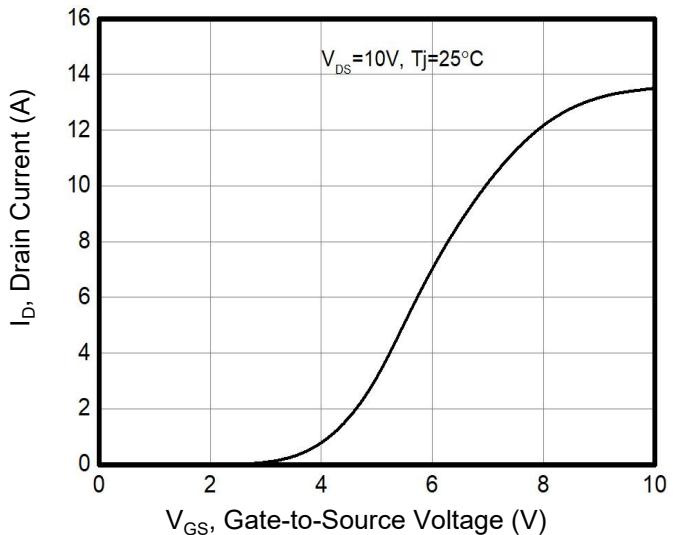


Figure 3. Drain Current vs. Temperature

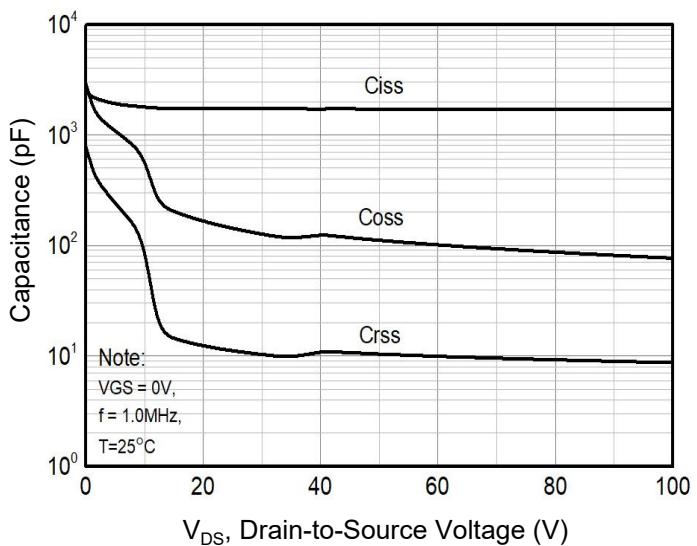
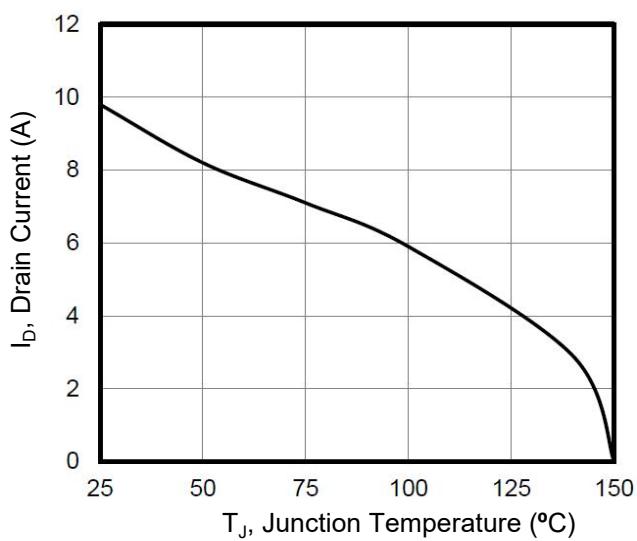


Figure 5. Gate Charge

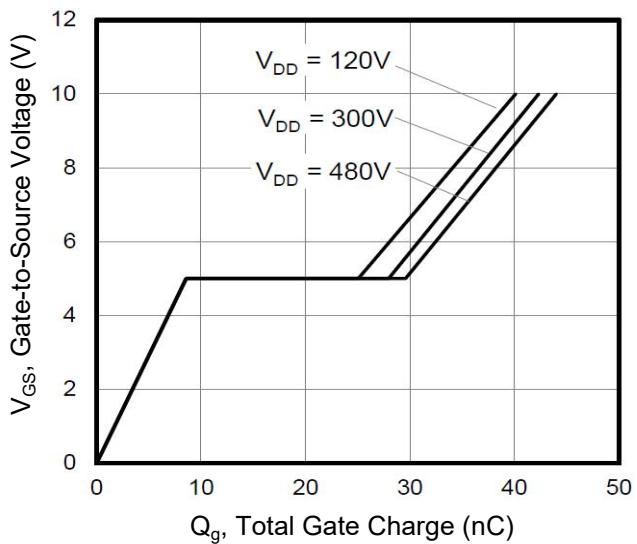
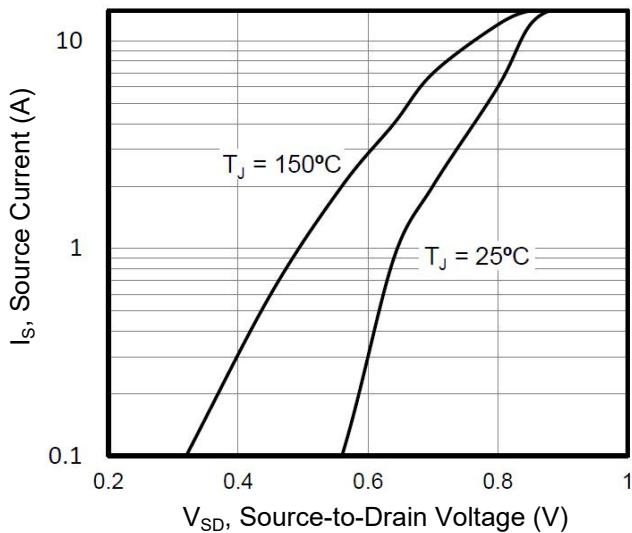


Figure 6. Body Diode Forward Voltage



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

Figure 7. On-Resistance vs. Temperature

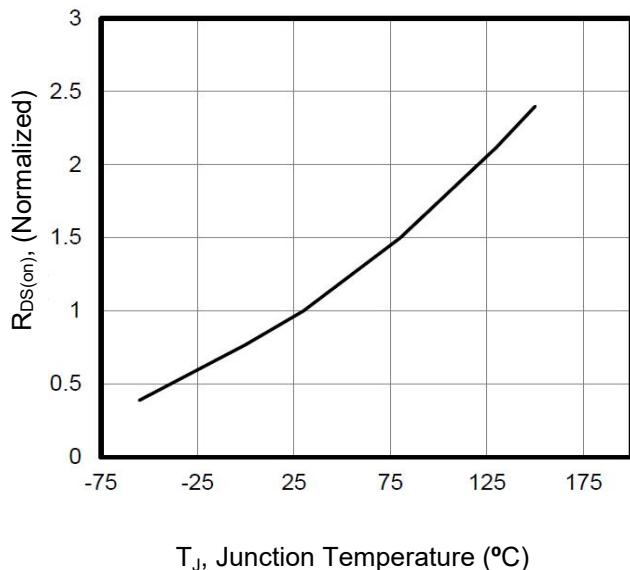


Figure 8. Transient Thermal Impedance (TO-220F)

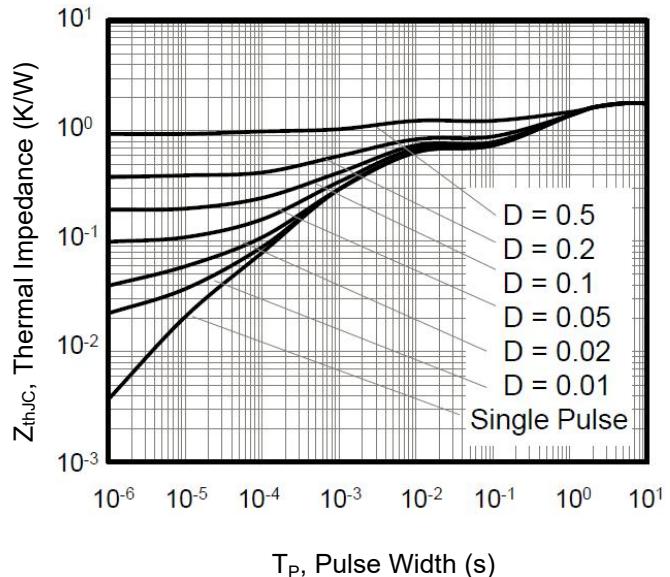


Figure 9. Transient Thermal Impedance (TO-220 TO-262 TO-263)

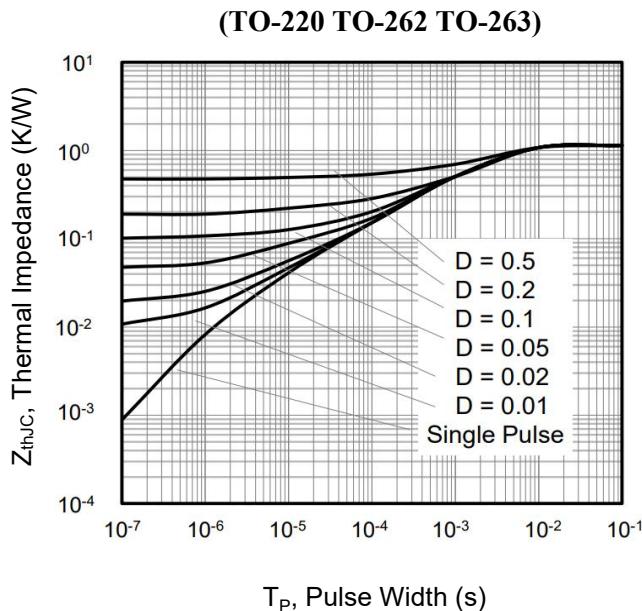
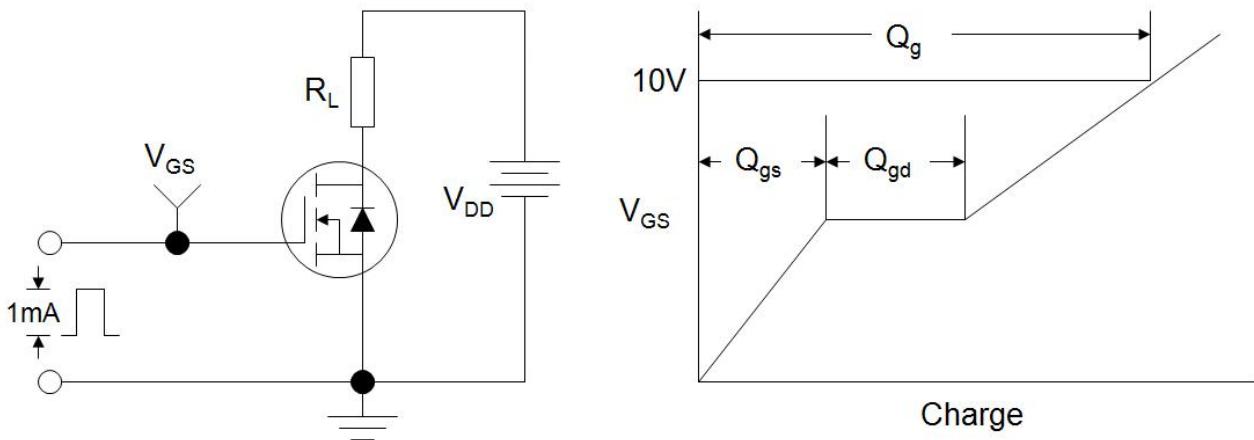
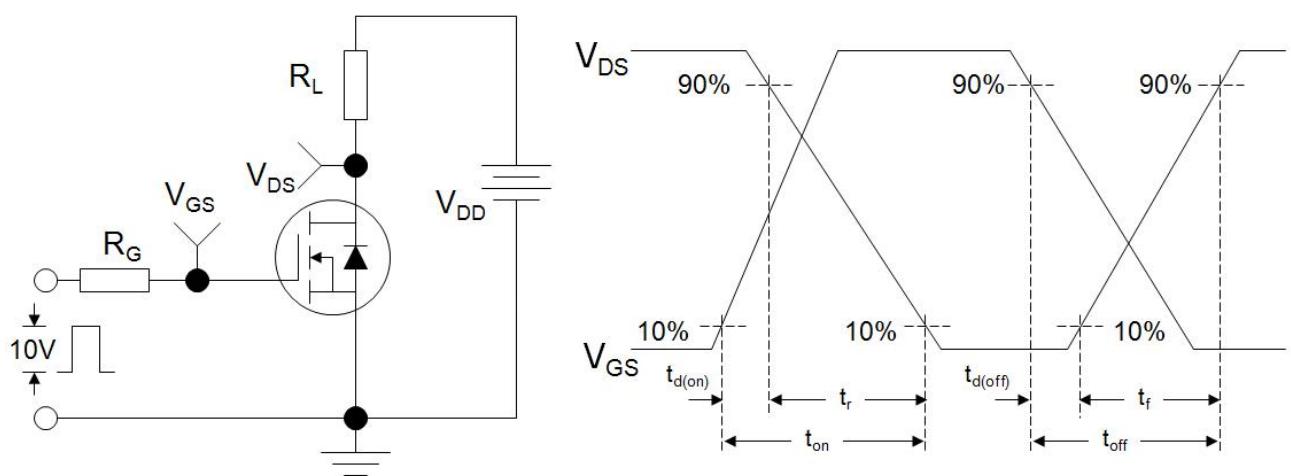
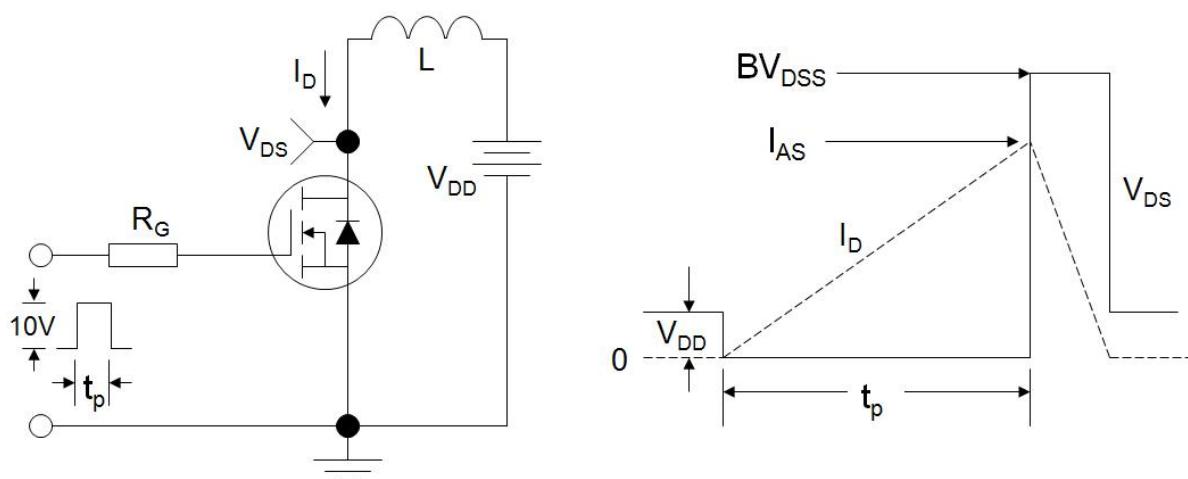
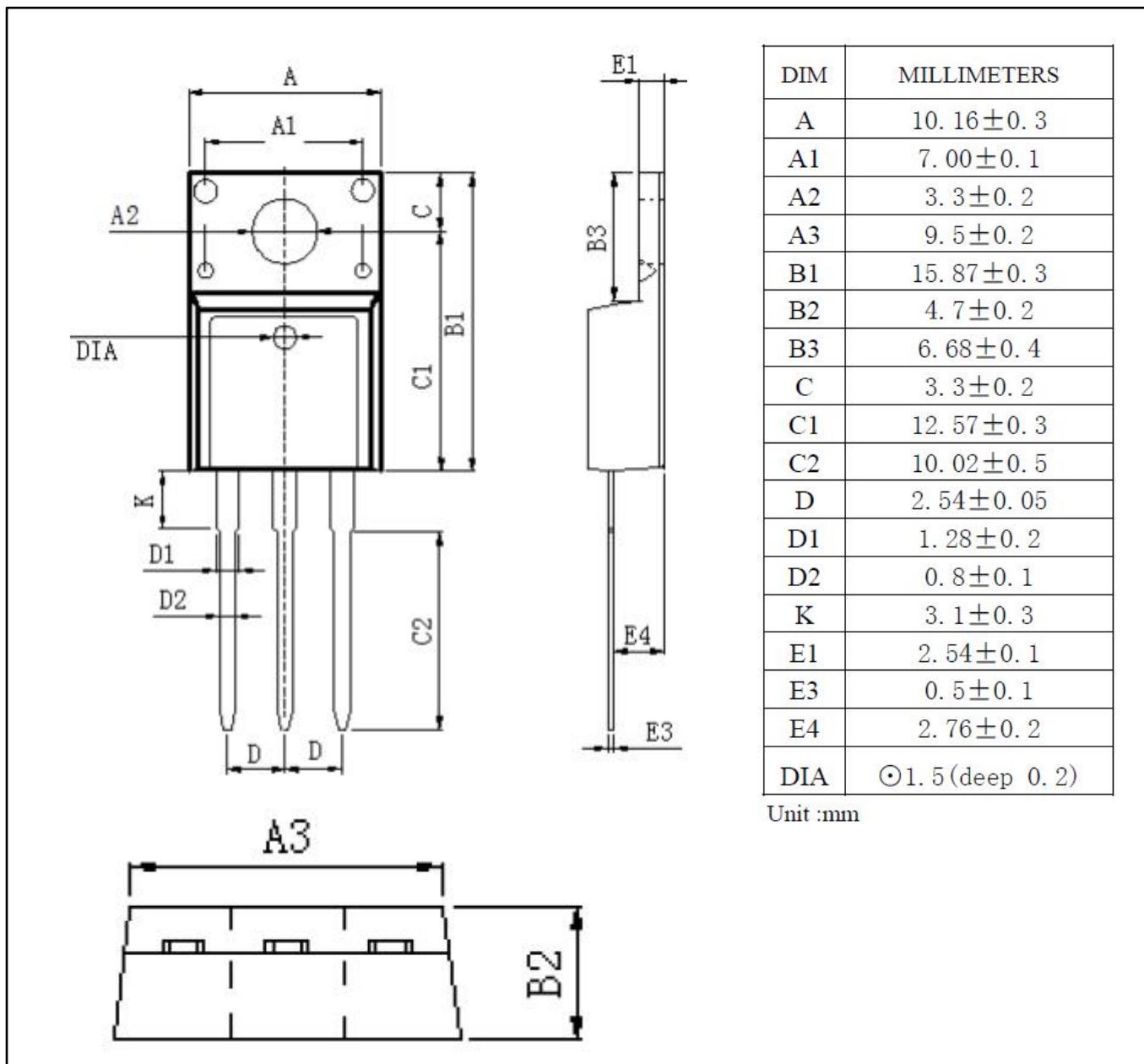


Figure A: Gate Charge Test Circuit and Waveform

Figure B: Resistive Switching Test Circuit and Waveform

Figure C: Unclamped Inductive Switching Test Circuit and Waveform


Outline Dimension

Unit: mm

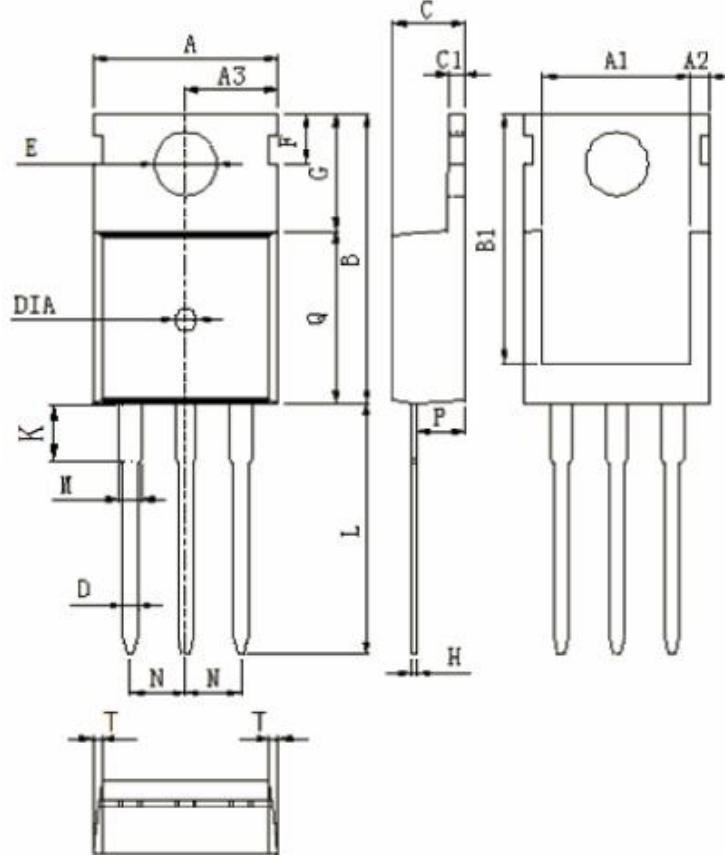
TO-220F



Outline Dimension

Unit: mm

TO-220

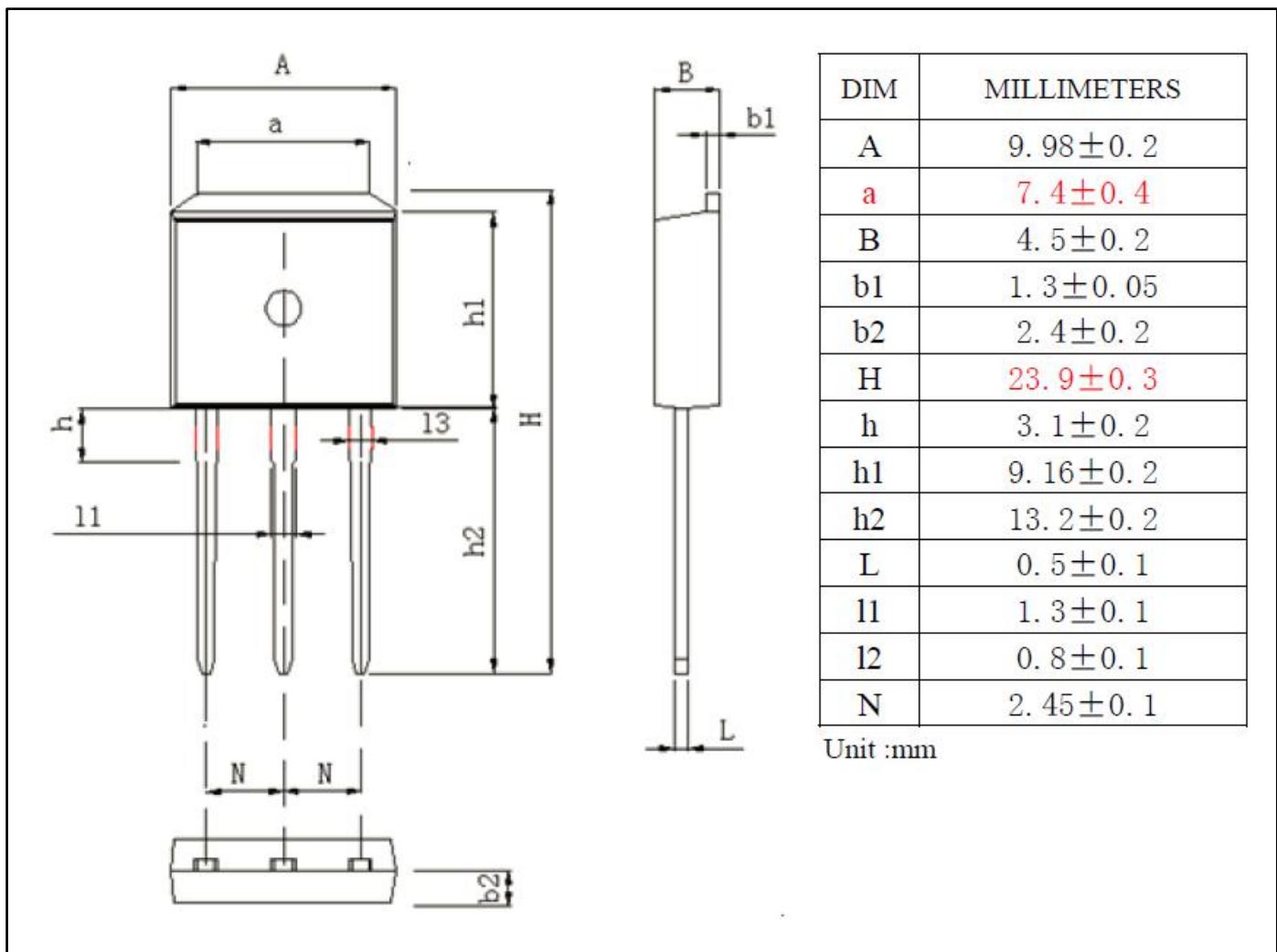


DIM	MILLIMETERS
A	10.0±0.3
A1	8.64±0.2
A2	1.15±0.1
A3	5.0±0.2
B	15.8±0.4
B1	13.2±0.3
C	4.56±0.1
C1	1.3±0.2
D	0.8±0.2
E	3.6±0.2
F	2.95±0.3
G	6.5±0.3
H	0.5±0.1
K	3.1±0.2
L	13.2±0.4
M	1.25±0.1
N	2.54±0.1
P	2.4±0.3
Q	9.0±0.3
T	W:0.35
DIA	◎1.5(deep 0.2)

Unit :mm

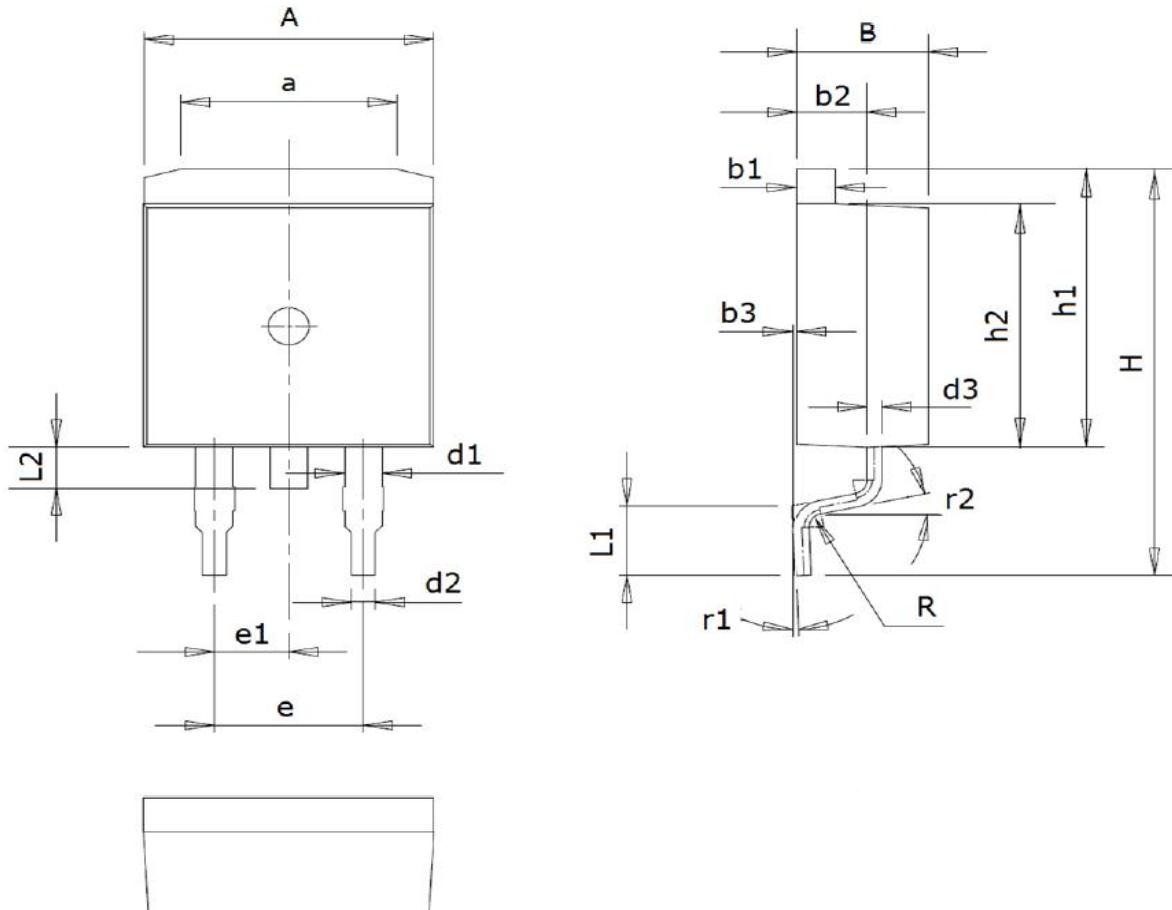
Outline Dimension

Unit: mm

TO-262


Outline Dimension

Unit: mm

TO-263


Symbol	Dimensions (mm)	Symbol	Dimensions (mm)	Symbol	Dimensions (mm)
A	9.6~10.0	d2	0.7~0.9	L1	2.4~2.9
a	7.0~7.8	d3	0.4~0.6	L2	1.3~1.8
B	4.3~4.7	e	5.08 (typ)	R	0.5(typ)
b1	1.25~1.35	e1	2.54 (typ)	r1	0~8°
b2	2.2~2.6	H	15.2~15.8	r2	12° (typ)
b3	0~0.2	h1	10.3~10.7		
d1	1.2~1.4	h2	9.1~9.4		