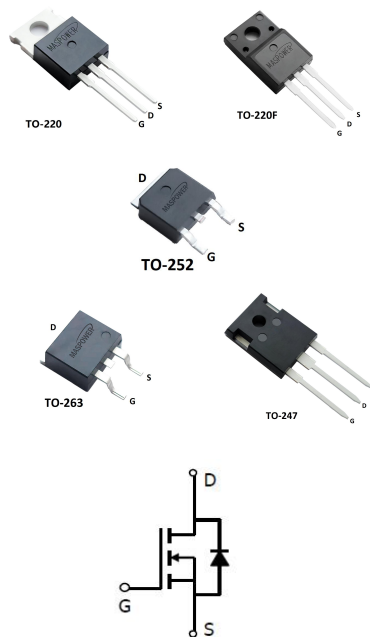


Features

- 100% avalanche tested
- Avalanche ruggedness
- Very low intrinsic capacitances
- High speed switching
- Very low on-resistance

Applications

- Welder
- UPS
- PV Inverter
- Switching applications



Electrical ratings

Absolute maximum ratings			
Parameter	Symbol	Value	Unit
Drain-source voltage ($V_{GS} = 0$)	V_{DSS}	1200	V
Transient Gate- source voltage	V_{GSM}	± 30	
Continuous Gate- source voltage(DC)	V_{GSS}	± 20	
Drain current (continuous) at $T_C = 25\text{ }^{\circ}\text{C}$	I_D	6	A
Drain current (continuous) at $T_C = 100\text{ }^{\circ}\text{C}$		3.8	
Drain current (pulsed)	I_{DM}	24	
Total dissipation at $T_C = 25\text{ }^{\circ}\text{C}$ (TO-247/TO-220/TO-263)	P_{TOT}	160	W
Total dissipation at $T_C = 25\text{ }^{\circ}\text{C}$ (TO-220F)	P_{TOT}	32	W
Total dissipation at $T_C = 25\text{ }^{\circ}\text{C}$ (TO-252)	P_{TOT}	45	W
Operating junction temperature	T_J	-55 to 150	$^{\circ}\text{C}$
Storage temperature	T_{stg}		
Maximum lead temperature for soldering purpose	T_L	300	$^{\circ}\text{C}$
Avalanche characteristics			
Parameter	Symbol	Max value	Unit
Avalanche current, repetitive or not-repetitive (pulse width limited by T_J max)	I_{AR}	2.1	A

Single pulse avalanche energy (starting $T_J = 25\text{ }^{\circ}\text{C}$, $I_D = I_{AR}$, $V_{DD} = 50\text{ V}$)	E_{AS}	753	mJ
---	----------	-----	----

Electrical Characteristics ($T_{vj} = 25^{\circ}\text{C}$ unless otherwise specified)

On /off states						
Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
Drain-source breakdown voltage	$V_{(BR)DSS}$	$I_D = 250\text{ }\mu\text{A}$, $V_{GS} = 0\text{V}$	1200			V
Zero gate voltage drain current ($V_{GS} = 0$)	I_{DSS}	$V_{DS} = \text{Max rating}$ $V_{DS}=\text{Max rating}$, $T_C=125\text{ }^{\circ}\text{C}$			66	μA
Gate-body leakage current ($V_{DS} = 0$)	I_{GSS}	$V_{GS} = \pm 20\text{ V}$			± 100	nA
Gate threshold voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = 250\text{ }\mu\text{A}$	4	5	6	V
Static drain-source on resistance	$R_{DS(on)}$	$V_{GS} = 10\text{V}$, $I_D = 1\text{A}$		6	7	Ω
Dynamic						
Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
Forward transconductance	g_{fs}	$V_{DS} = 15\text{ V}$, $I_D = 3\text{ A}$		5.7		S
Input capacitance	C_{iss}	$V_{DS}=25\text{V}$, $f=1\text{MHz}$, $V_{GS}=0$		1121		pF
Output capacitance	C_{oss}			97		
Reverse transfer capacitance	C_{rss}			19		
Equivalent Output capacitance	$C_{oss\text{ eq.}}$	$V_{GS}=0$, $V_{DS}=0\text{ to }1200\text{V}$		120		
Total gate charge	Q_g	$V_{DD}=600\text{V}$, $I_D=3\text{A}$ $V_{GS}=10\text{V}$		85		nC
Gate-source charge	Q_{gs}			14		
Gate-drain charge	Q_{gd}			48		
Switching times						
Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
Turn-on delay time	$t_{d(on)}$	$V_{DD} = 960\text{V}$, $I_D = 3\text{ A}$, $R_G = 4.7\text{ }\Omega$, $V_{GS} = 10\text{ V}$		33		ns
Rise time	t_r			26		
Turn-off-delay time	$t_{d(off)}$			46		
Fall time	t_f			21		
Source drain diode						
Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
Source-drain current	I_{SD}			6		A
Source-drain current (pulsed)	I_{SDM}			24		

Forward on voltage	V_{SD}	$I_{SD} = 1A, V_{GS} = 0$		0.76		V
Reverse recovery time	t_{rr}	$I_{SD} = 6A, di/dt = 100A/\mu s$ $V_{DD} = 600V$		360		ns
Reverse recovery charge	Q_{rr}			5.3		μC
Reverse recovery current	I_{RRM}			19		A
Reverse recovery time	t_{rr}	$I_{SD} = 6A, di/dt = 100A/\mu s$ $V_{DD} = 600V, T_J = 125^\circ C$		520		ns
Reverse recovery charge	Q_{rr}			7.6		μC
Reverse recovery current	I_{RRM}			17		A

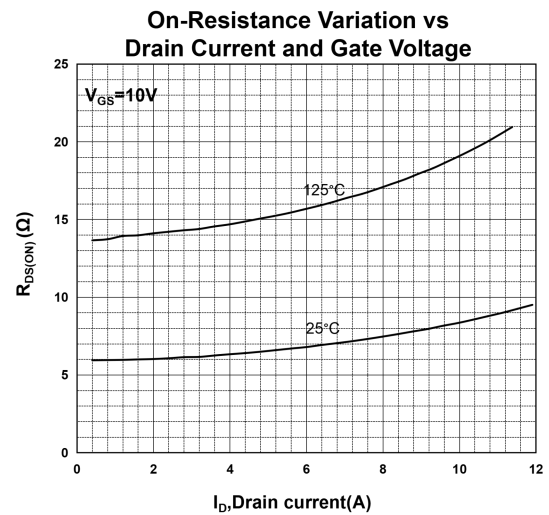
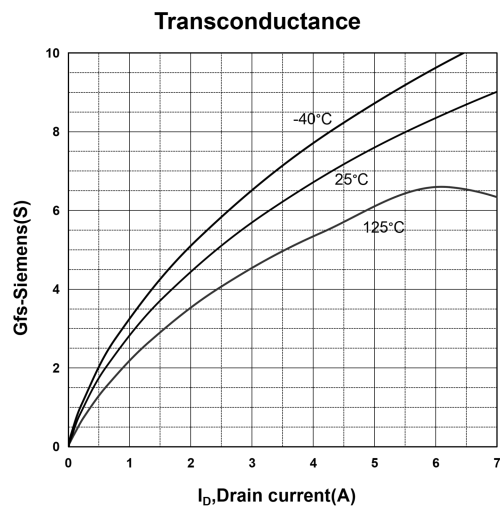
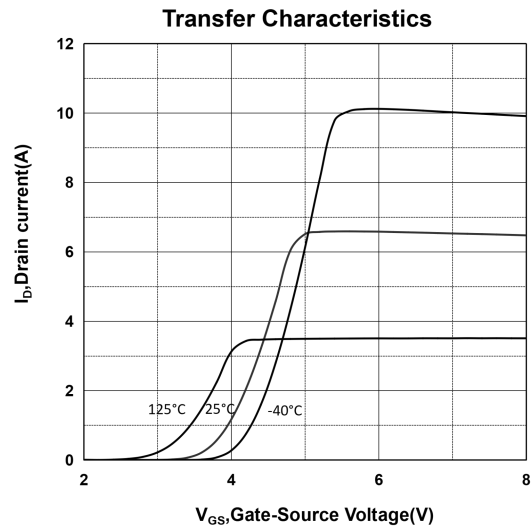
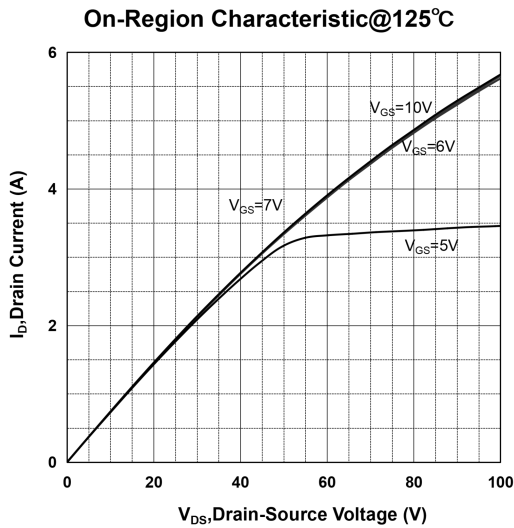
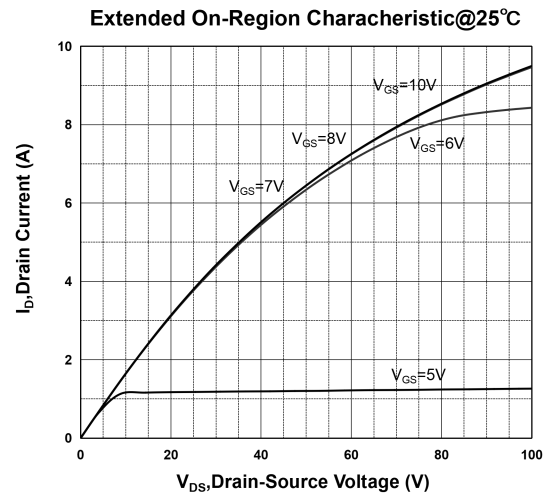
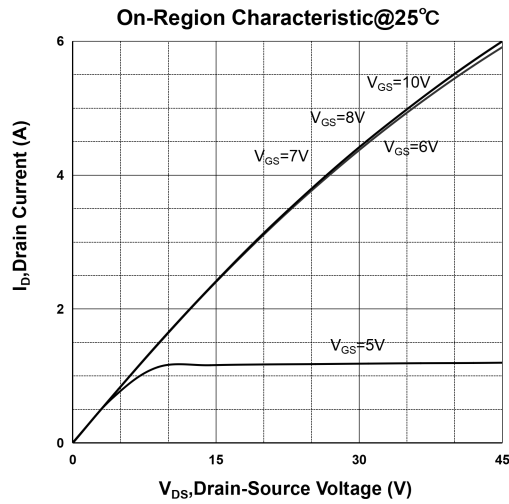
Thermal data

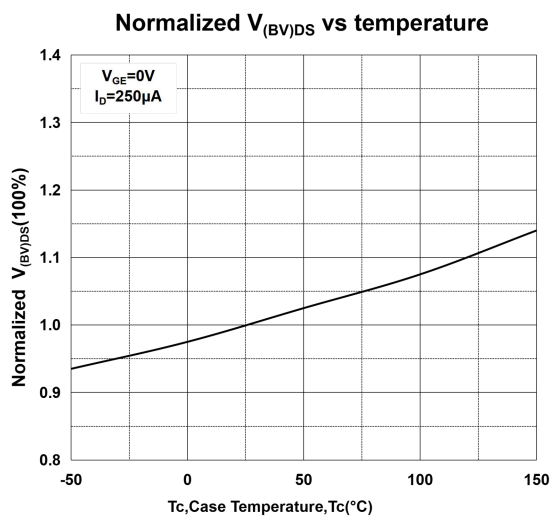
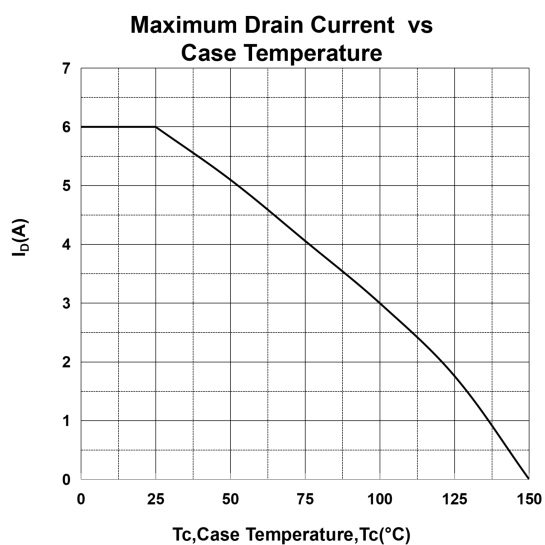
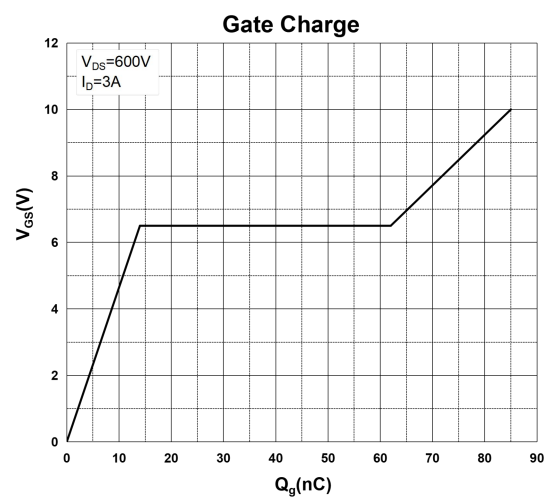
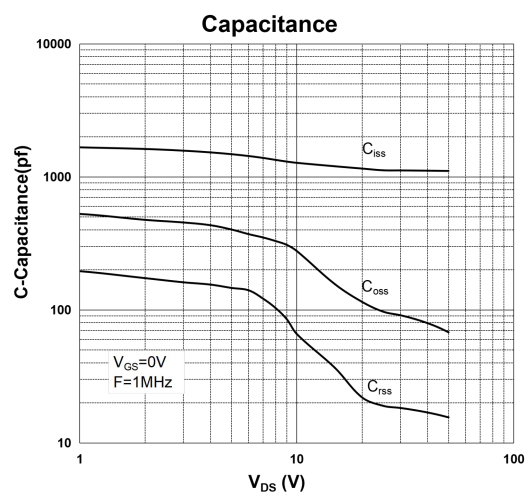
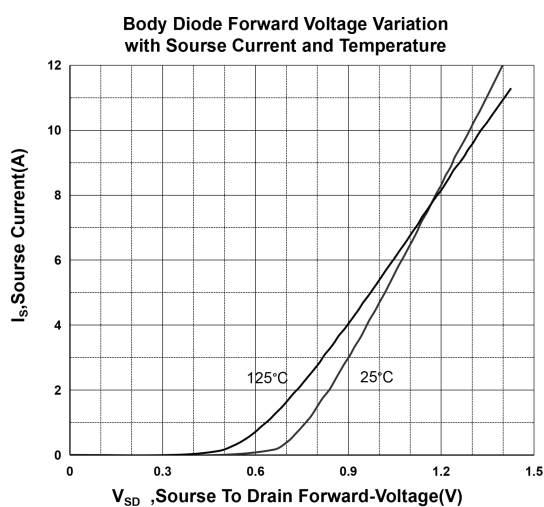
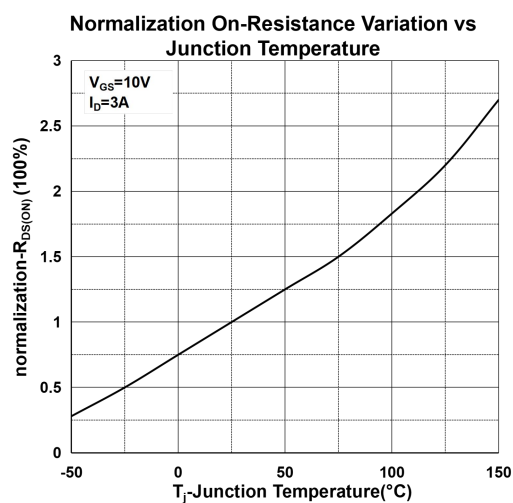
Parameter	Symbol	Value			Unit
		TO-247/TO-220 /TO-263	TO-220F	TO-252	
Thermal resistance junction-case max	R_{thj-c}	0.78	3.79	2.7	$^\circ C/W$
Thermal resistance junction-ambient max	R_{thj-a}	40	84	62.5	

Order information

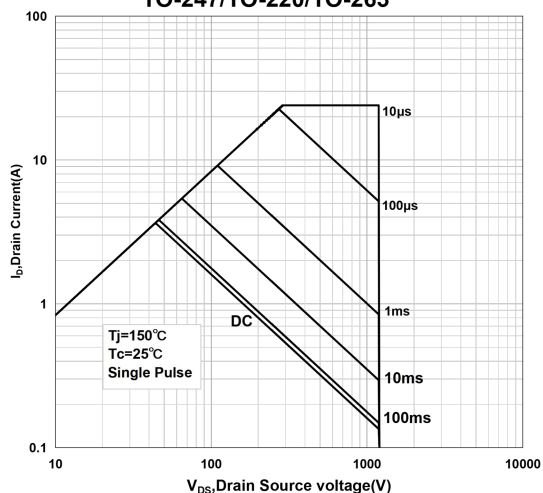
	Parking		
MS6N120FS	TO-220F	Tube	
MS6N120FT	TO-220	Tube	
MS6N120FC	TO-247	Tube	
MS6N120FE	TO-263	Tube	
MS6N120FD	TO-252	Tube	

Electrical characteristics

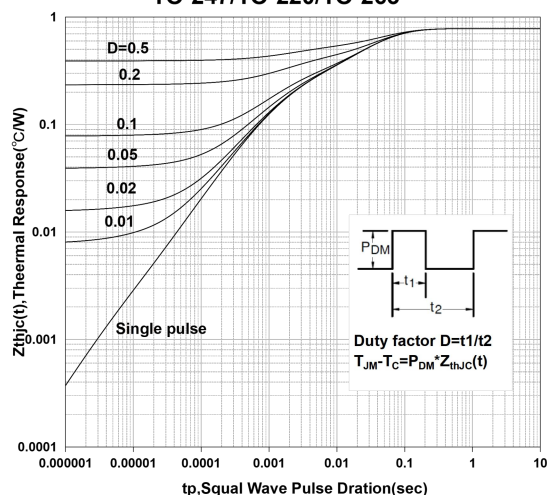




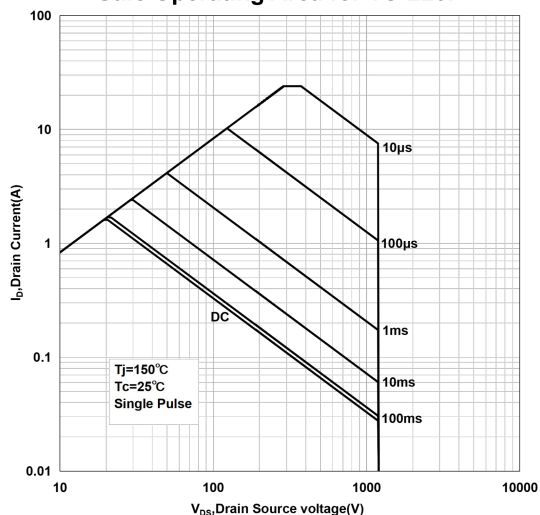
Safe Operating Area for TO-247/TO-220/TO-263



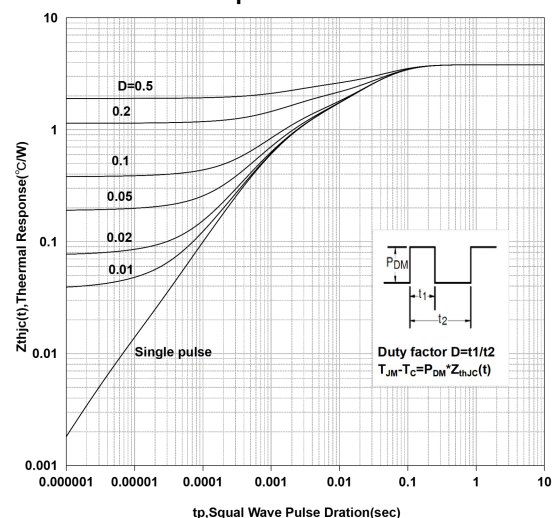
Transient response Curve for TO-247/TO-220/TO-263



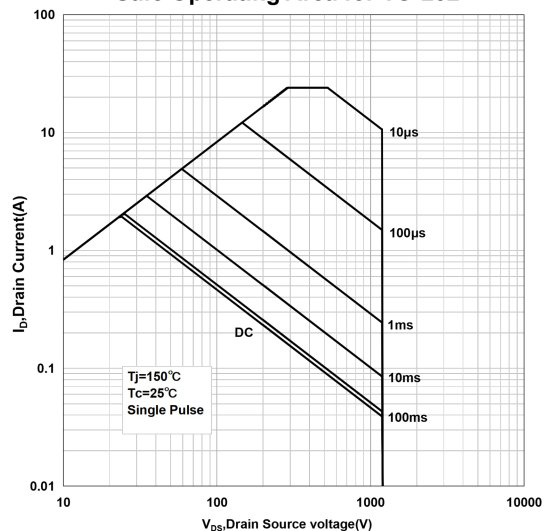
Safe Operating Area for TO-220F



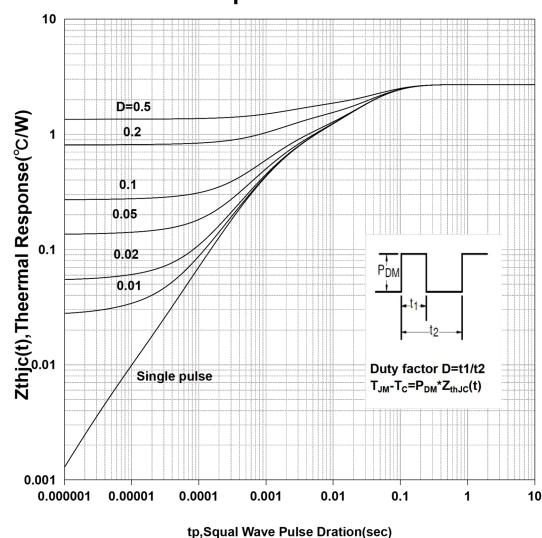
Transient response Curve for TO-220F



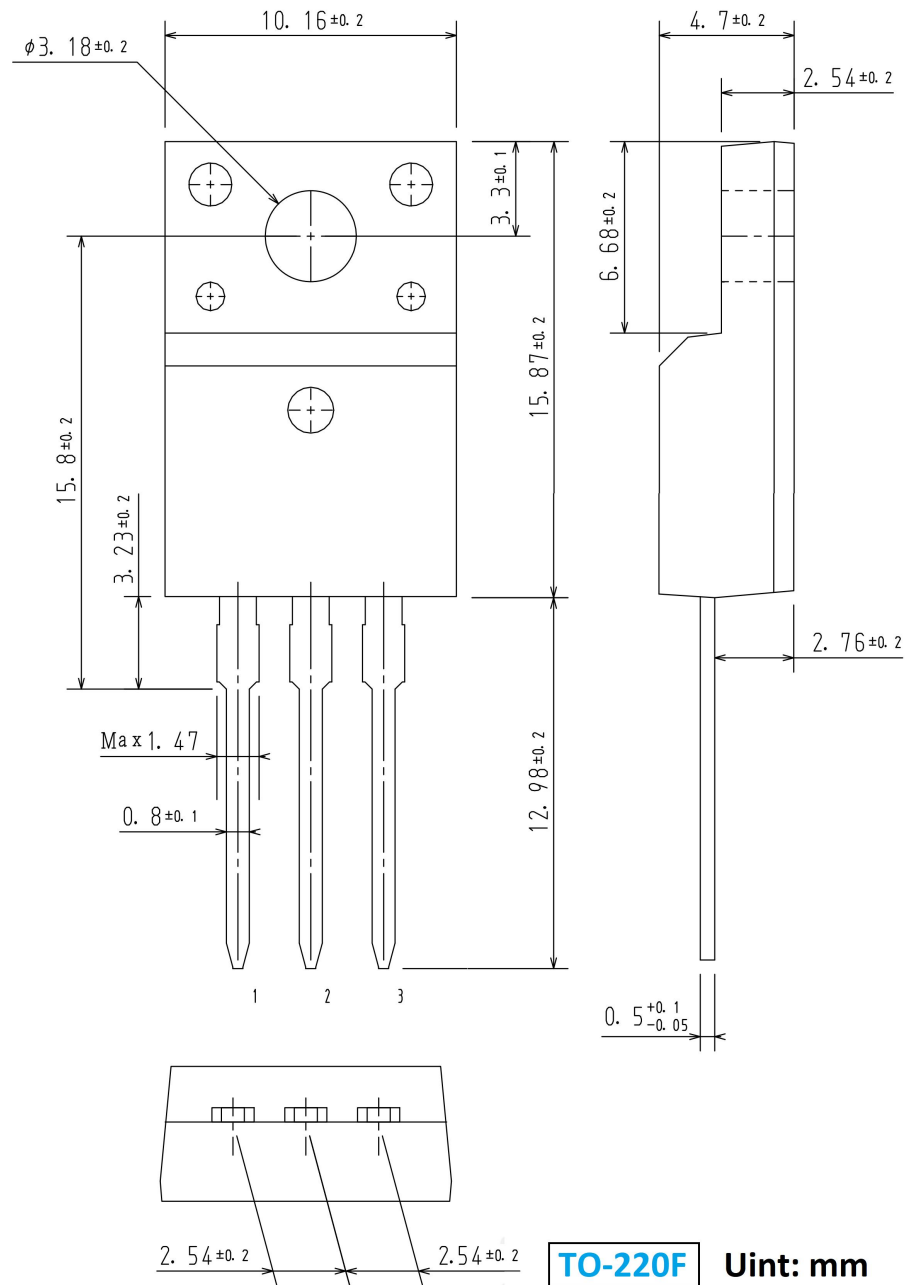
Safe Operating Area for TO-252

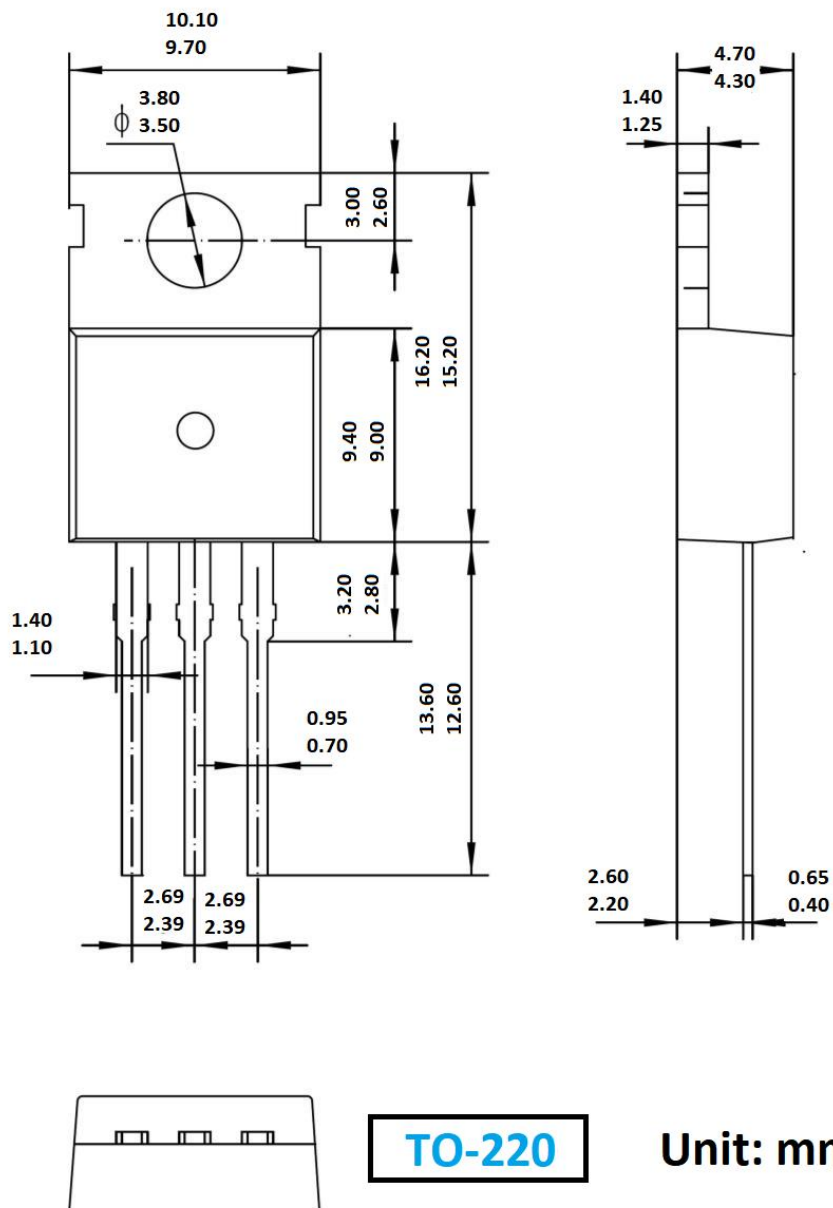


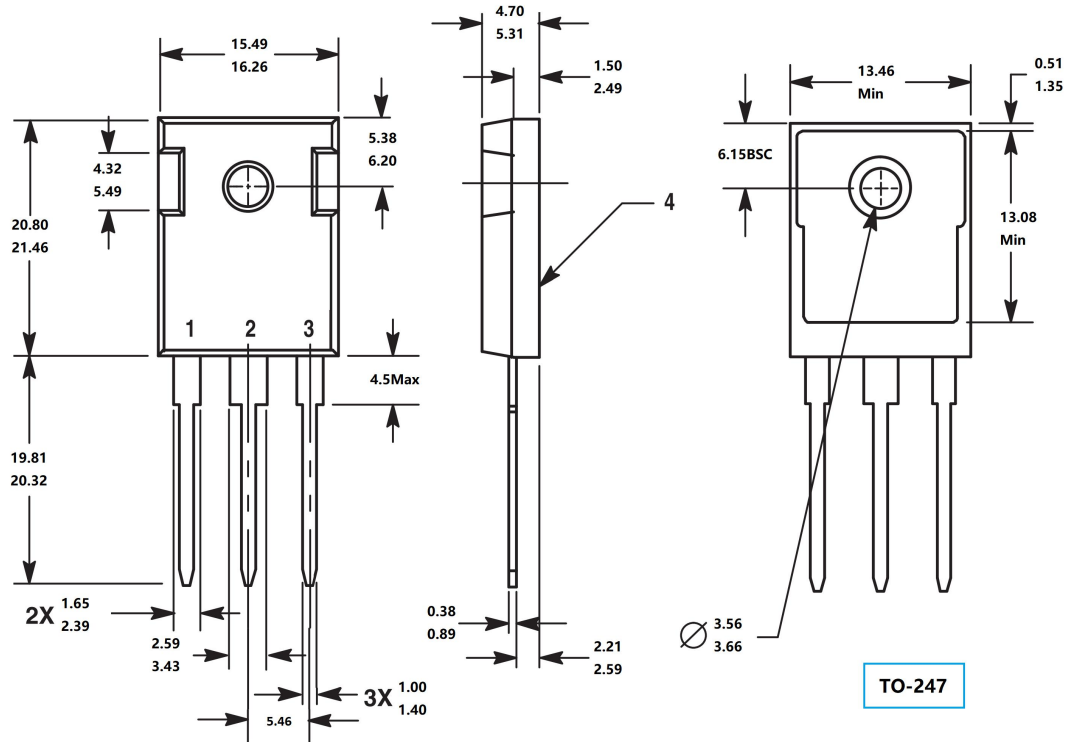
Transient response Curve for TO-252



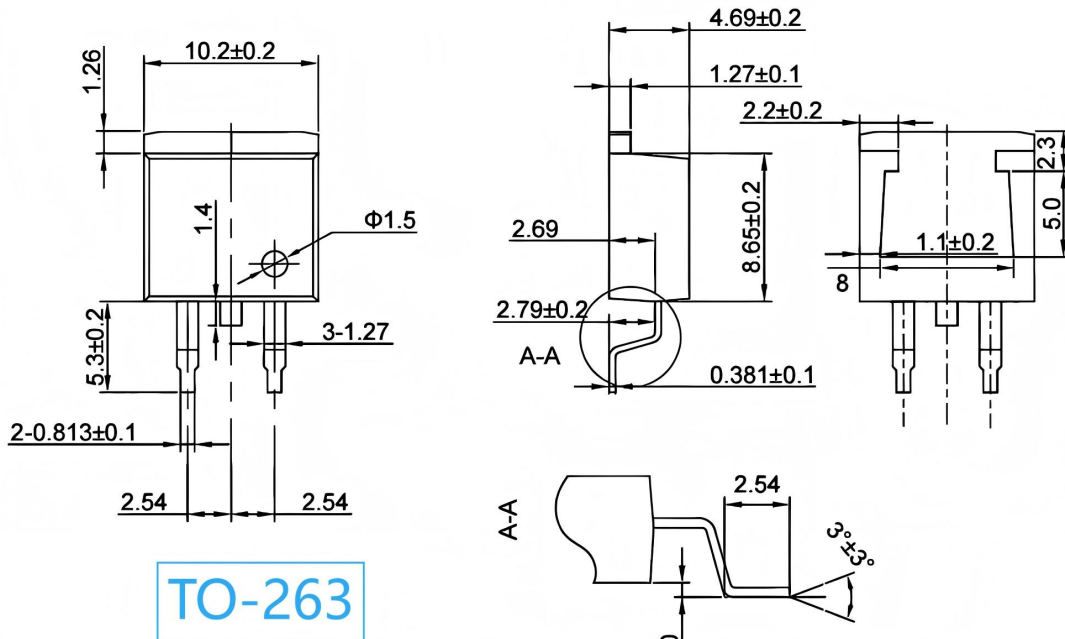
Package outline dimension







TO-247



TO-263

The plastic sealing surface is bright



Notes:

1. Unmarked tolerance $\pm 0.15\text{mm}$; unmarked $R < 0.15\text{mm}$
2. The resin body is not allowed to have defects, shrinkage holes, cracks, bubbles and other harmful defects
3. The drawing indicates that the leg has reinforcement
4. Unit : mm

