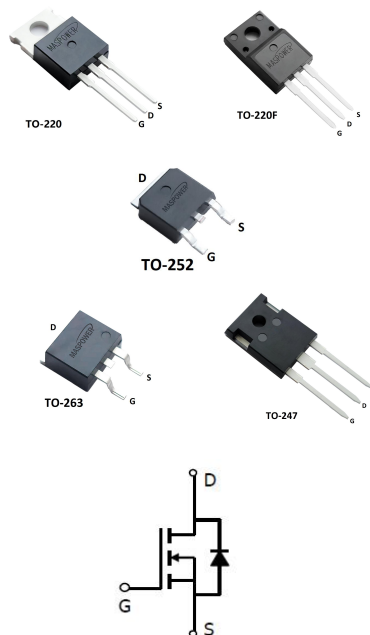


Features

- 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_{DS}	1200	V	
Gate- source voltage		V_{GS}	± 30		
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}	33	W	
Total dissipation at $T_C = 25\text{ }^{\circ}\text{C}$ (TO-252)		P_{TOT}	45.8	W	
Derating factor(TO-247/TO-220/TO-263)			1.28	$\text{W}/^{\circ}\text{C}$	
Derating factor(TO-220F)			0.26	$\text{W}/^{\circ}\text{C}$	
Derating factor(TO-252)			0.37	$\text{W}/^{\circ}\text{C}$	
Operating junction temperature		T_J	-55 to 150	$^{\circ}\text{C}$	
Storage temperature		T_{stg}			
Thermal data					
Parameter	Symbol	Value			Unit
		TO-247/TO-220 /TO-263	TO-220F	TO-252	
Thermal resistance junction-case max	$R_{\text{thj-c}}$	0.78	3.79	2.7	$\text{W}/^{\circ}\text{C}$

Thermal resistance junction-ambient max	R _{thj-a}	40	84	62.5	
Maximum lead temperature for soldering purpose	T _L	300			°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 °C, I _D = I _{AR} , V _{DD} = 50 V)		E _{AS}	753	mJ	

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

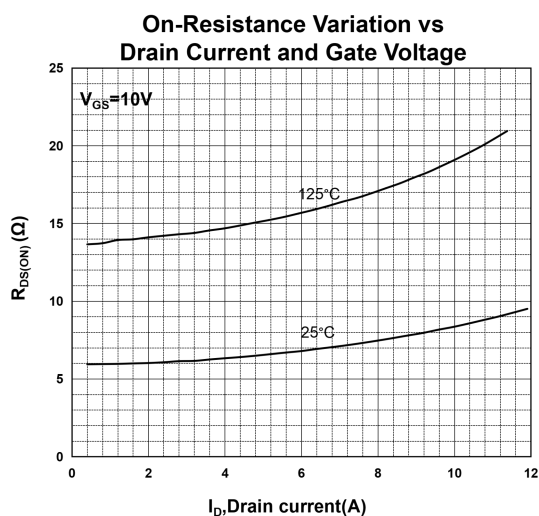
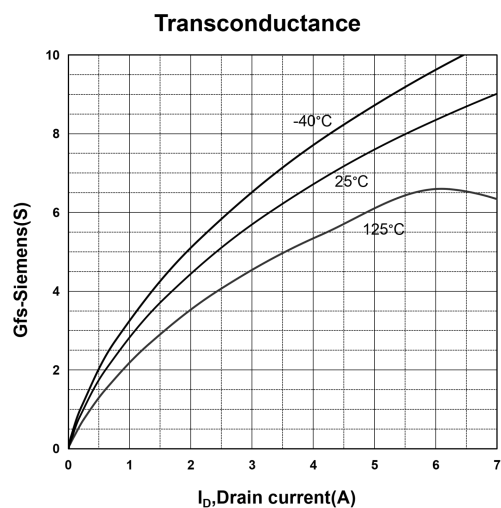
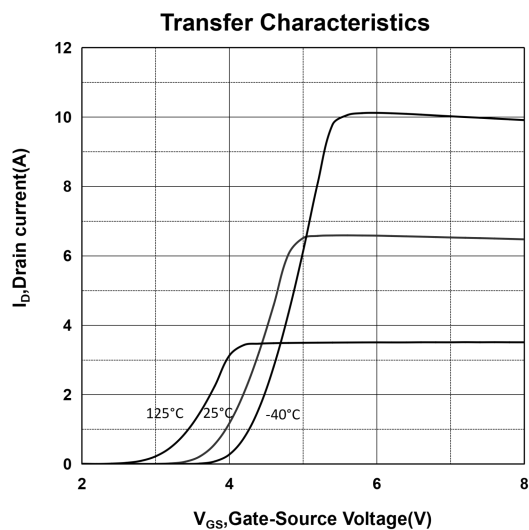
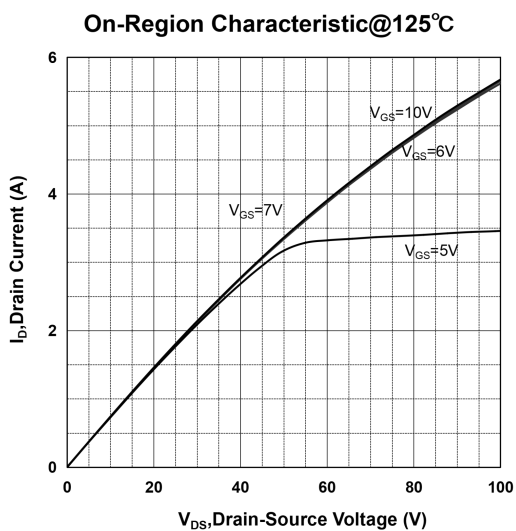
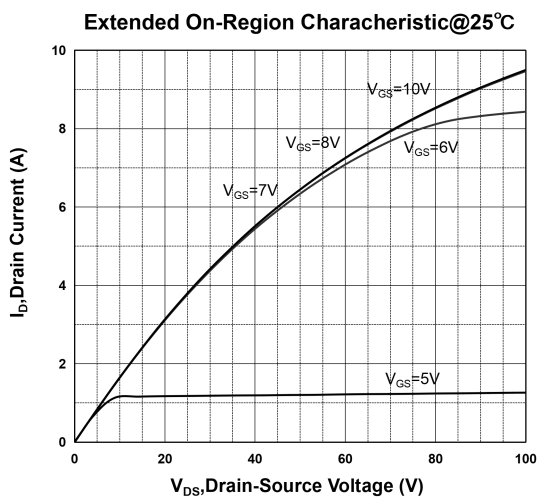
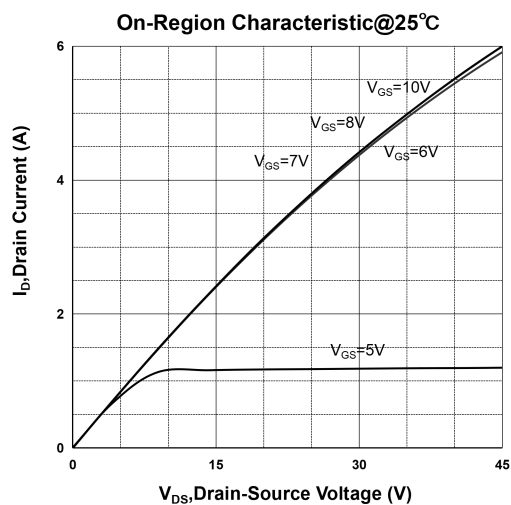
On /off states						
Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
Drain-source breakdown voltage	$V_{(BR)DSS}$	$I_D = 1\text{ mA}$, $V_{GS} = 0V$	1200			V
Zero gate voltage drain current ($V_{GS} = 0$)	I_{DSS}	$V_{DS} = \text{Max rating}$ $V_{DS}=\text{Max rating}$, $T_C=125\text{ }^{\circ}\text{C}$			66	μA
Gate-body leakage current ($V_{DS} = 0$)	I_{GSS}	$V_{GS} = \pm 30\text{ V}$			± 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	$R_{DS(on)}$	$V_{GS} = 10V$, $I_D = 1A$		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}	$V_{DS}=25V, f=1MHz, V_{GS}=0$		1121		pF
Output capacitance	C_{oss}			97		
Reverse transfer capacitance	C_{rss}			19		
Equivalent Output capacitance	$C_{oss\text{ eq.}}$	$V_{GS}=0, V_{DS}=0\text{ to }1200V$		120		
Total gate charge	Q_g	$V_{DD}=600V, I_D=3A$ $V_{GS}=10V$		85		nC
Gate-source charge	Q_{gs}			14		
Gate-drain charge	Q_{gd}			48		
Switching times						
Parameter	Symbol	Test conditions	Min	Typ	Max	Unit

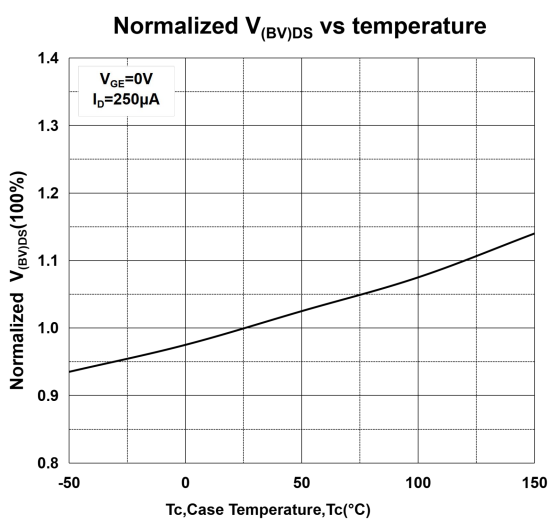
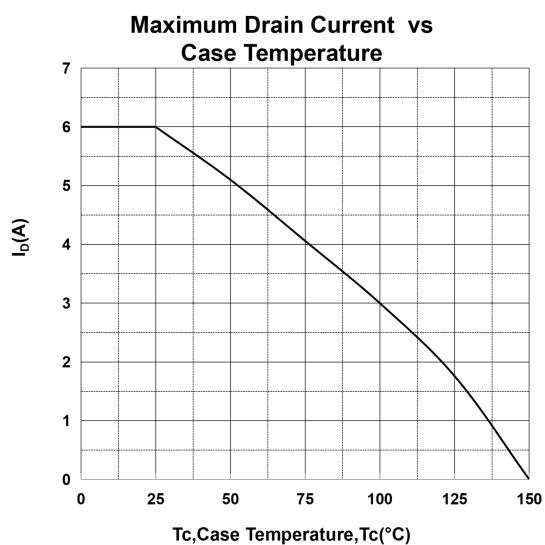
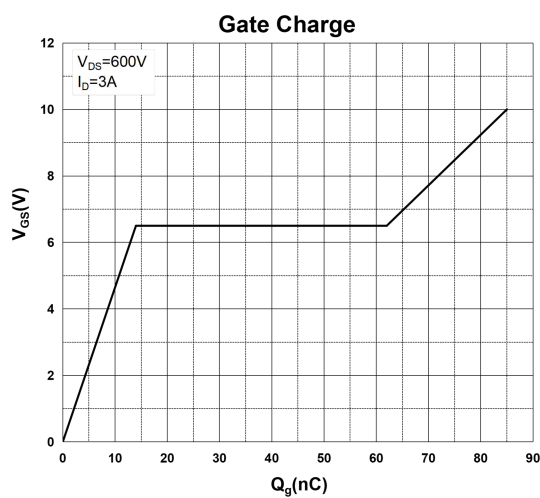
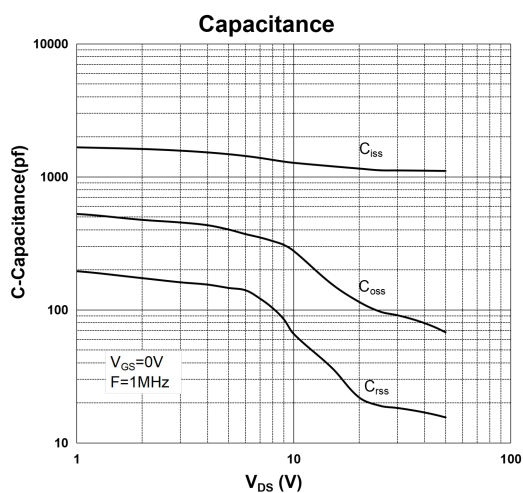
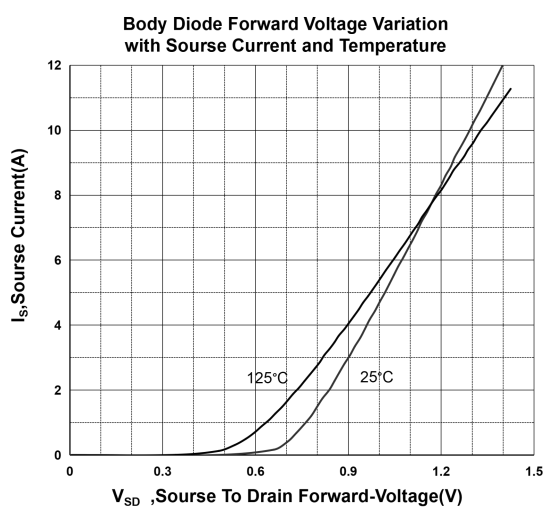
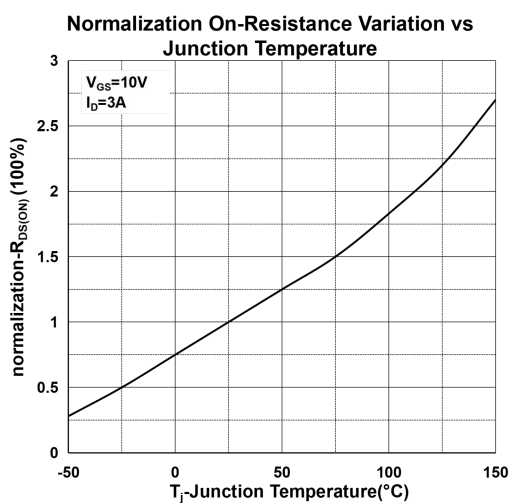
Turn-on delay time	t _{d(on)}	V _{DD} = 960V, I _D = 3 A, R _G = 4.7 Ω, V _{GS} = 10 V		33		ns
Rise time	t _r			26		
Turn-off-delay time	t _{d(off)}			46		
Fall time	t _f			21		
Source drain diode						
Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
Source-drain current	I _{SD}			6		A
Source-drain 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/μs 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/μs V _{DD} = 600V T _J =125°C		520		ns
Reverse recovery charge	Q _{rr}			7.6		μC
Reverse recovery current	I _{RRM}			17		A

Order information

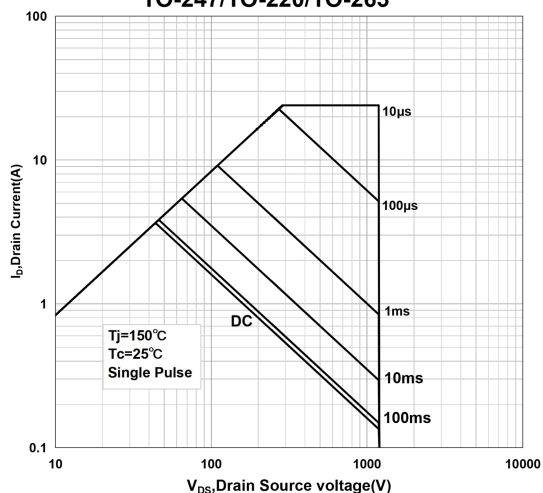
	Parking		
MS6N120FS	TO-220F	Tube	
MS6N120FT	TO-220	Tube	
MS6N120FC	TO-247	Tube	
MS6N120FE	TO-263	Tube	
MS6N120FD	TO-252	Tube	

Electrical characteristics

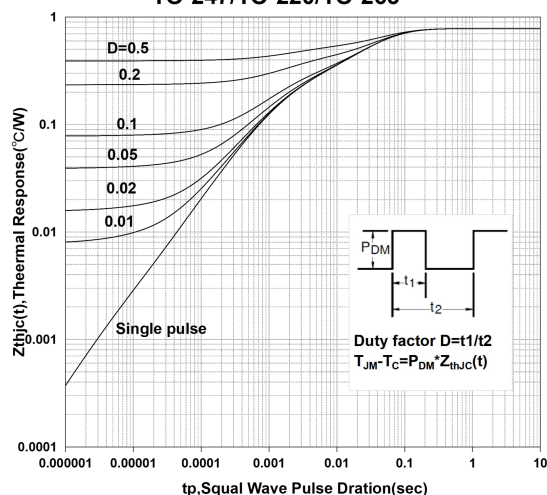




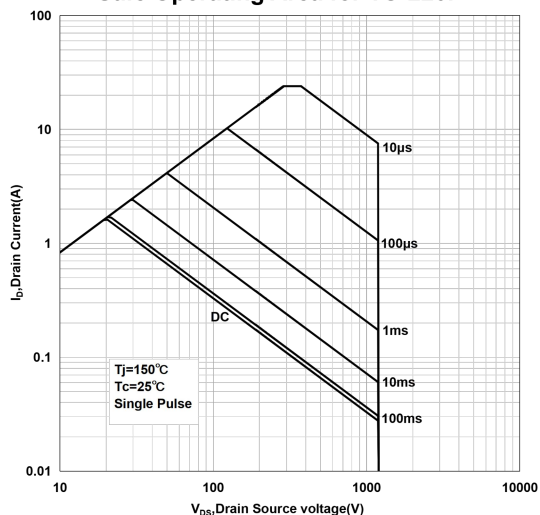
Safe Operating Area for TO-247/TO-220/TO-263



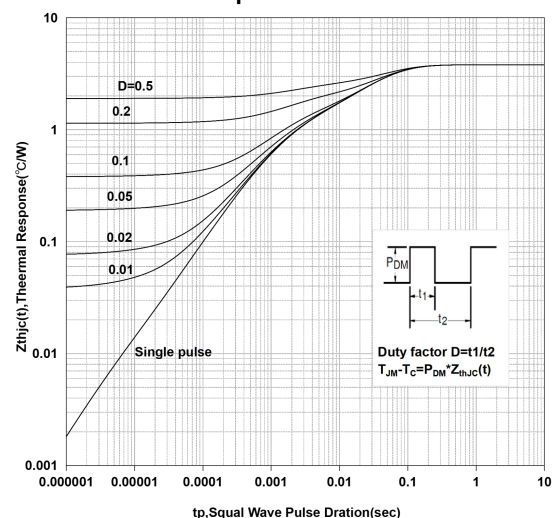
Transient response Curve for TO-247/TO-220/TO-263



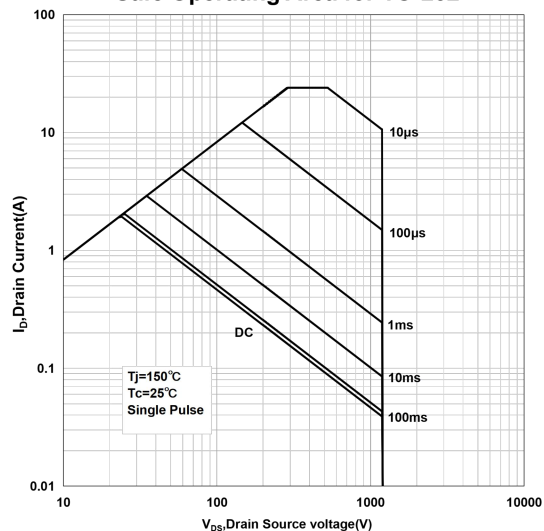
Safe Operating Area for TO-220F



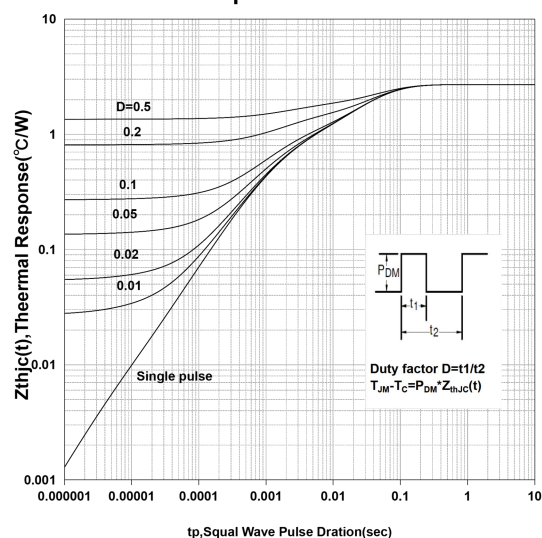
Transient response Curve for TO-220F



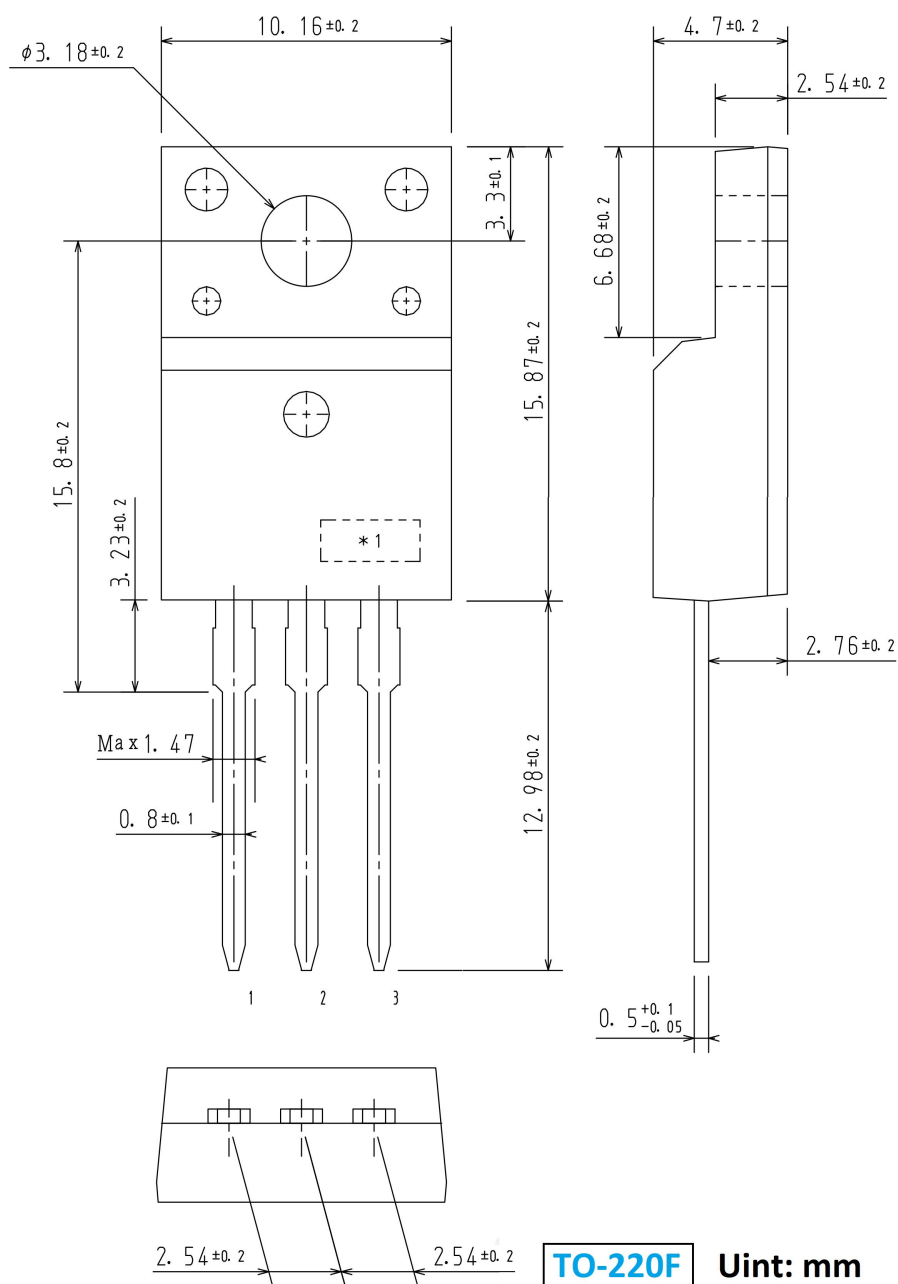
Safe Operating Area for TO-252

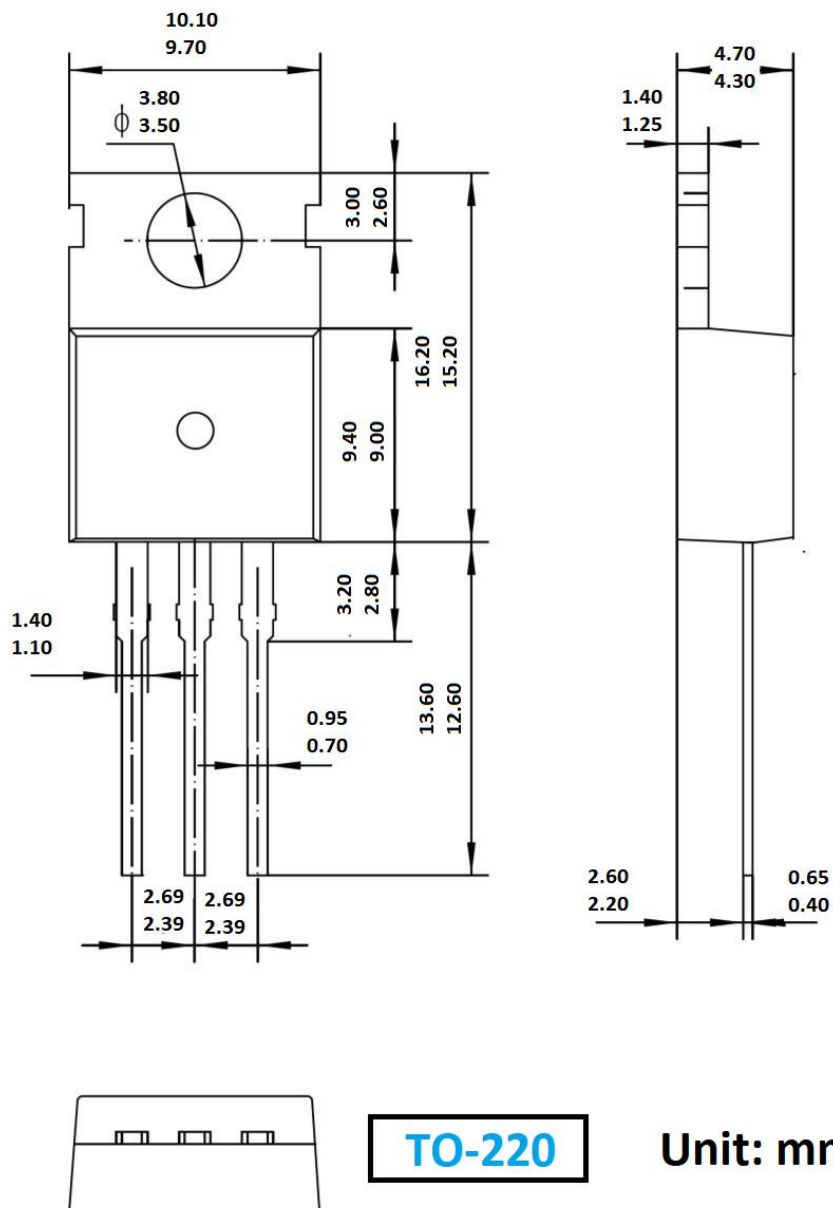


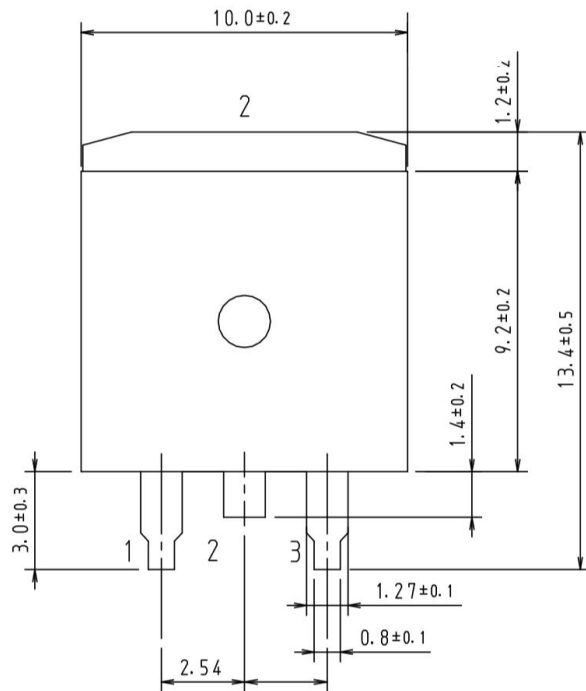
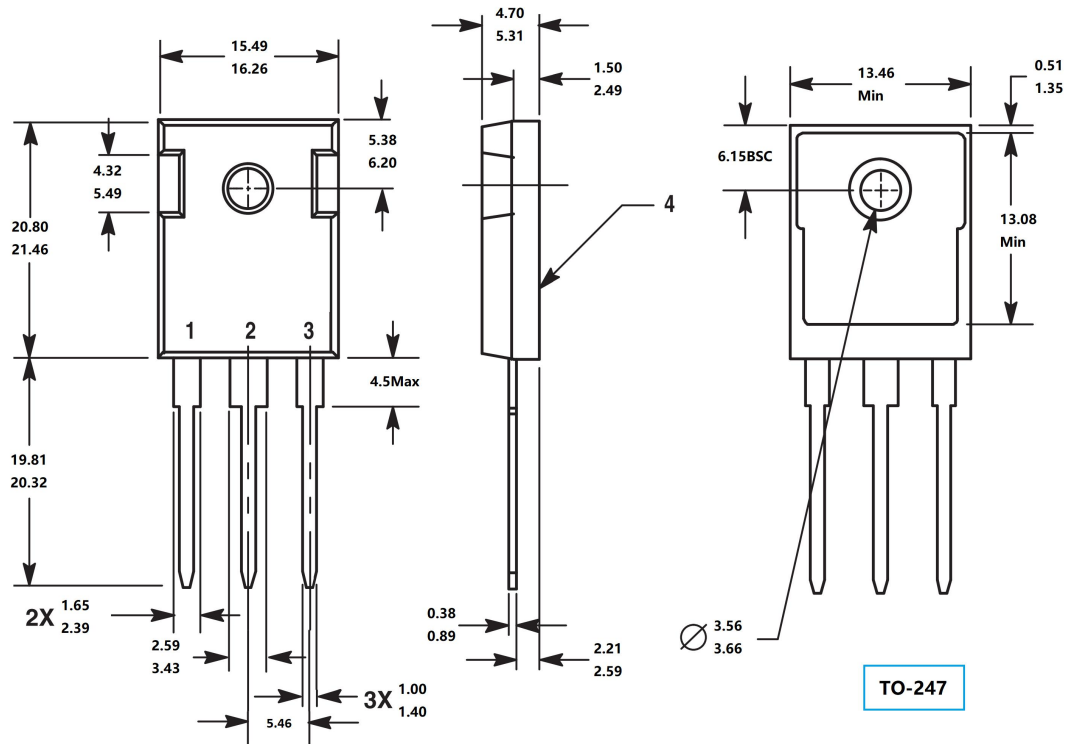
Transient response Curve for TO-252



Package outline dimension







Unit:mm

