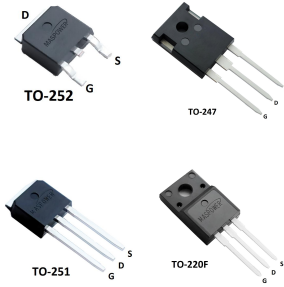
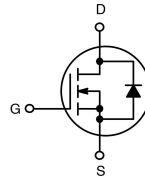


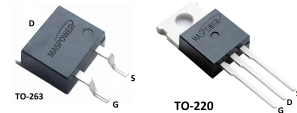
features

- Low gate charge (typical 12nC)
- Low C_{RSS} (typical 5.5pF)
- 100% avalanche tested
- Fast switching
- Improved dv/dt capability



Applications

- Switching application



Electrical ratings($T_C=25^{\circ}\text{C}$, unless otherwise specified)

Parameter	Symbol	Value	Unit
Drain-source voltage ($V_{GS}=0$)	V_{DSS}	1000	V
Transient Gate-source voltage	V_{GSM}	± 30	
Continuous Gate-source voltage(DC)	V_{GS}	± 20	
Drain current (continuous)	I_D	$T_C=25^{\circ}\text{C}$ 3	A
		$T_C=100^{\circ}\text{C}$ 2.1	
Drain current-pulsed(note 1)	I_{DM}	12	A
Avalanche current repetitive or not-repetitive (note 1)	I_{AR}	2.5	A
Single pulse avalanche energy (note 2)	E_{AS}	300	mJ
Total dissipation (TO-247/TO-220/TO-263)	P_D	271	W
Total dissipation(TO-252/TO-251)	P_D	50	W
Total dissipation(TO-220F)	P_D	73	W
Peak diode recovery voltage slope (note 3)	dv/dt	4.5	V/ns
Operating junction temperature	T_J	-55 to 150	$^{\circ}\text{C}$
Storage temperature	T_{STG}		
Maximum Lead Temperature for Soldering Purposes	T_L	300	$^{\circ}\text{C}$

Electrical characteristics ($T_{CASE}=25^{\circ}C$ unless otherwise specified)

Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
On/off states						
Drain-source breakdown voltage	$V_{(BR)DSS}$	$I_D=1mA$ $V_{GS}=0$	1000	-	-	V
Zero gate voltage drain current ($V_{GS}=0$)	I_{DSS}	$V_{DS}=\text{Max rating}$	-	-	1	μA
		$T_C=125^{\circ}C$	-	-	100	μA
Gate body leakage current ($V_{GS}=0$)	I_{GSS}	$V_{GS}=\pm 20V$	-	-	± 100	nA
Gate threshold voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}$ $I_D=250\mu A$	2.5	3.5	4.5	V
Static drain-source on resistance	$R_{DS(on)}$	$V_{GS}=10V$ $I_D=1A$	-	4.8	6.0	Ω
Dynamics						
Forward transconductance	g_{fs}	$V_{DS} = 10\text{ V},$ $I_D = 1A$	-	0.15	-	S
Input capacitance	C_{iss}	$V_{DS}=25V, f=1MHz,$ $V_{GS}=0$	-	390	500	pF
Output capacitance	C_{oss}		-	45	60	
Reverse transfer capacitance	C_{rss}		-	5.5	7.0	
Total gate charge	Q_g	$V_{DD}=800V, I_D=3A$ $V_{GS}=10V$	-	12	15	nC
Gate-source charge	Q_{gs}		-	2.8	-	
Gate-drain charge	Q_{gd}		-	6.1	-	
Turn-on delay time	$t_{d(on)}$	$V_{DD} = 500V,$ $I_D = 3A,$ $R_G = 25\ \Omega,$ $V_{GS} = 10\text{ V}$	-	15	40	ns
Rise time	t_r		-	35	80	
Turn-off-delay time	$t_{d(off)}$		-	20	50	
Fall time	t_f		-	30	70	
Source Drain Diode						
Source Drain Current	I_{SD}		-	-	3	A
Source Drain Current(Pulsed)	I_{SM}		-	-	12	A
Forward On Voltage	V_{SD}	$I_{SD}=1A, V_{GS}=0V$	-	-	1.2	V
Reverse Recovery Time	T_{rr}	$I_{SD}=3A,$ $di/dt=100A/\mu s$	-	400	-	ns
Reverse Recovery Charge	Q_{rr}	$I_{SD}=3A,$ $di/dt=100A/\mu s$	-	1.6	-	μC

Note:

1. Pulse width limited by maximum junction temperature
2. $L=91.2mH, I_{AS}=I_{AR}, V_{DD}=50V, R_G=25\Omega$, Starting $T_J=25^{\circ}C$
3. $I_{SD} \leq I_{DM}, di/dt \leq 300A/\mu s, V_{DD} \leq BV_{DSS}$, Starting $T_J=25^{\circ}C$
4. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$
5. Essentially independent of operating temperature

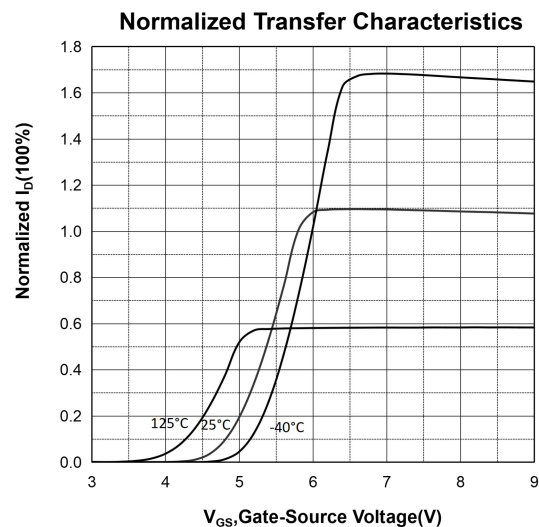
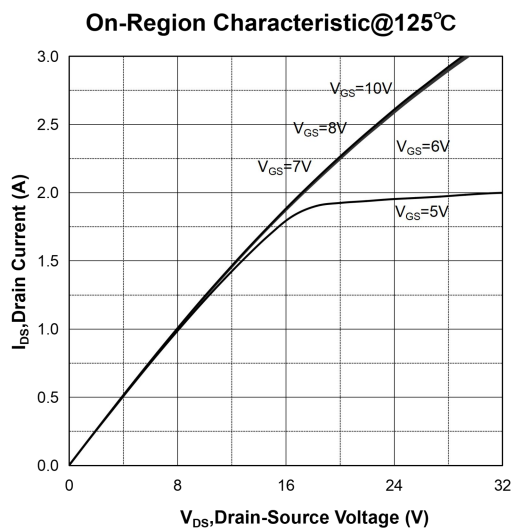
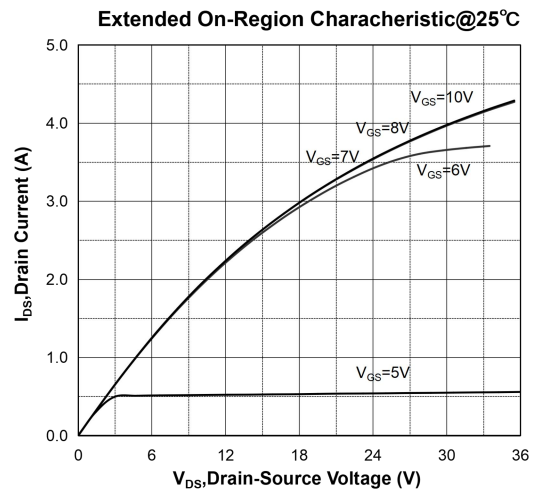
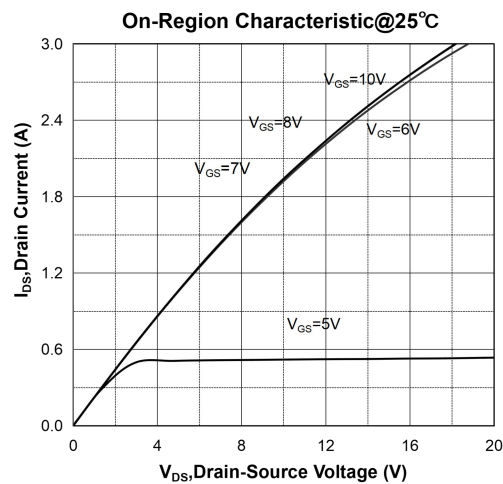
Thermal data

Parameter	Symbol	Value			Unit
		TO-247/TO-220 /TO-263	TO-252/ TO-251	TO-220F	
Thermal resistance junction max	R_{thj-C}	0.46	2.5	1.69	$^{\circ}C/W$
Thermal resistance junction to ambient	R_{thj-A}	40	65	52	$^{\circ}C/W$

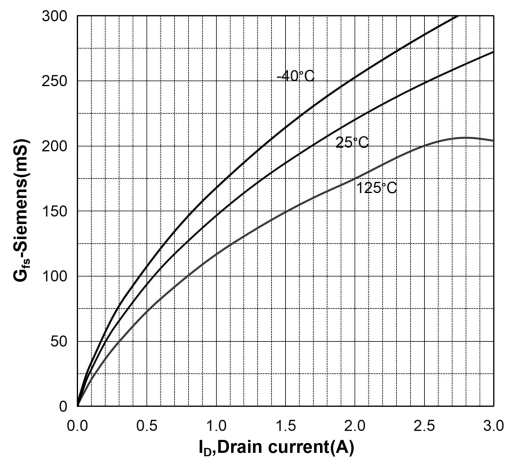
Order codes

Part number	Marking	Package
MS3N100HGC0	MS3N100HGC0	TO-247
MS3N100HGD0	MS3N100HGD0	TO-252
MS3N100HGT1	MS3N100HGT1	TO-220F
MS3N100HGD1	MS3N100HGD1	TO-251
MS3N100HGT0	MS3N100HGT0	TO-220
MS3N100HGE0	MS3N100HGE0	TO-263

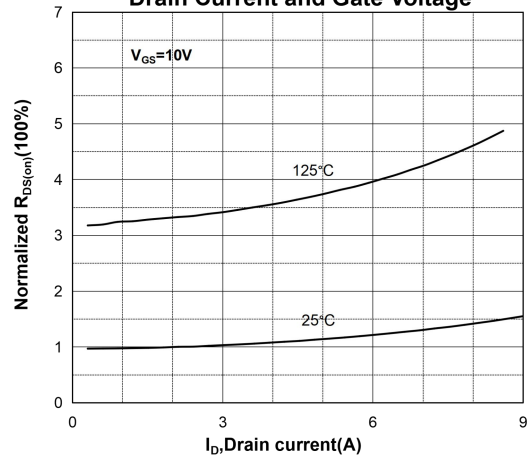
Electrical characteristics (curves)



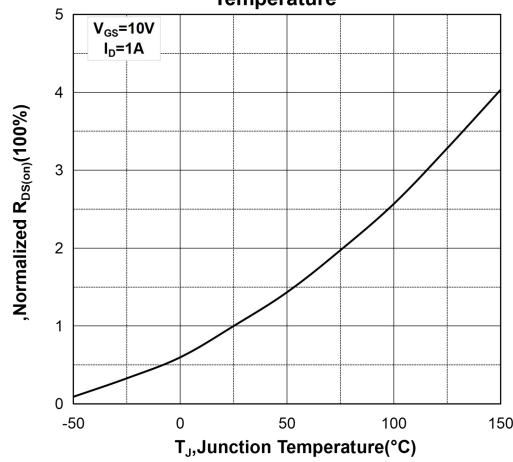
Transconductance



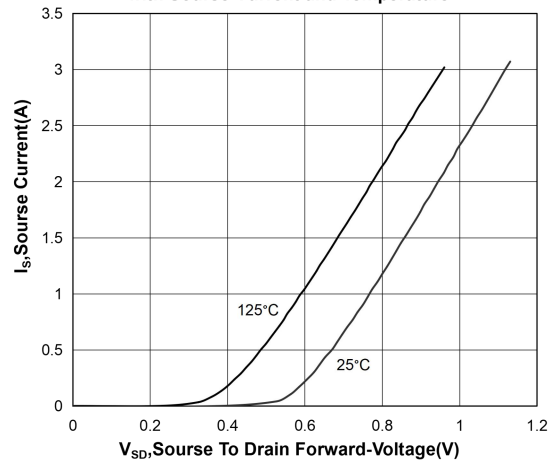
Normalized On-Resistance Variation vs Drain Current and Gate Voltage



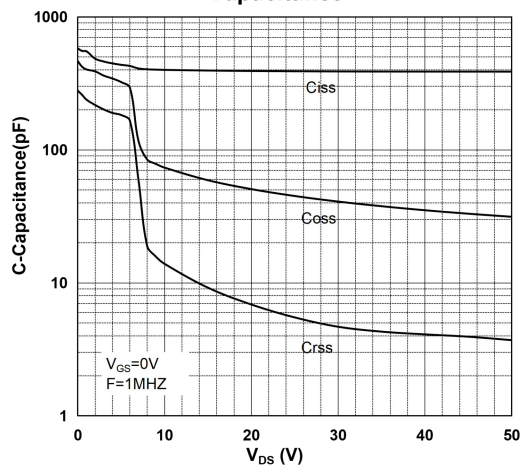
Normalized On-Resistance Variation vs Temperature



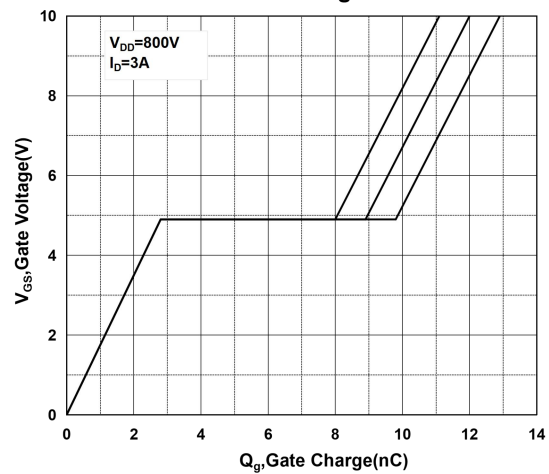
Body Diode Forward Voltage Variation with Source Current and Temperature



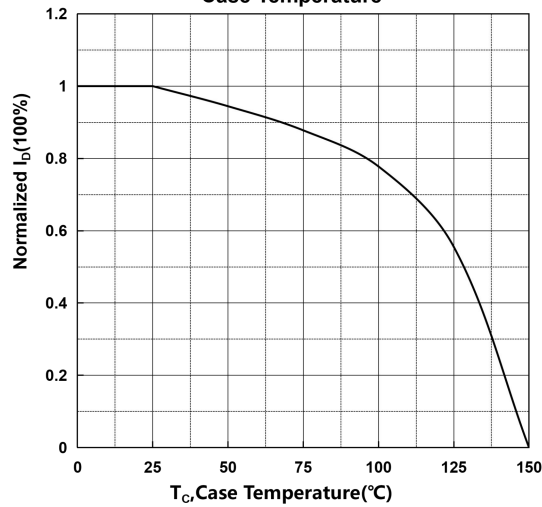
Capacitance



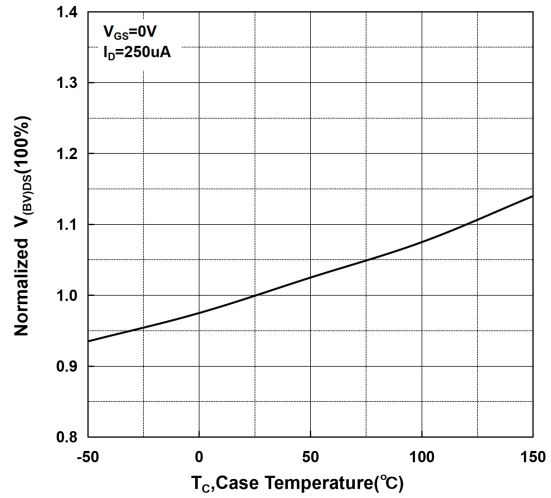
Gate Charge



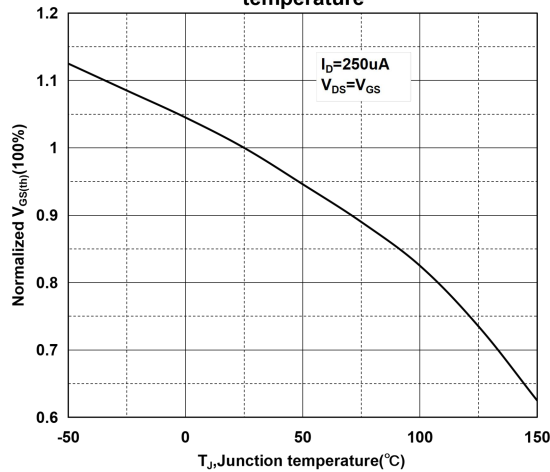
Normalized Maximum Drain Current vs Case Temperature



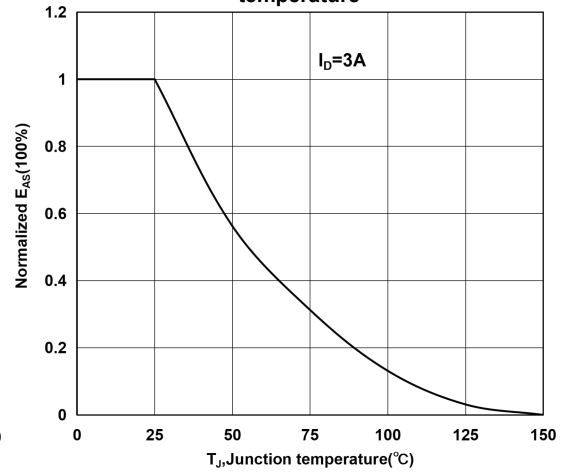
Normalized $V_{(BV)DS}$ vs temperature



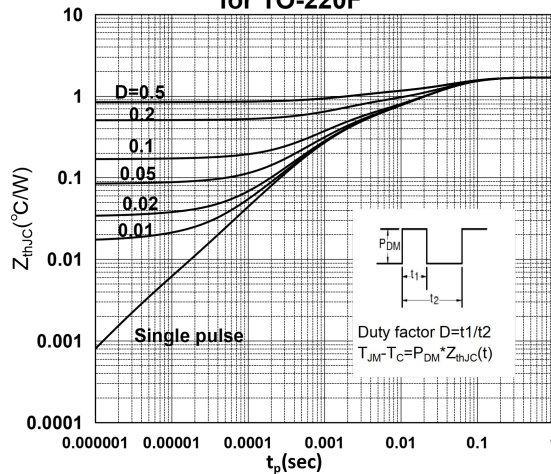
Normalized gate threshold voltage vs temperature



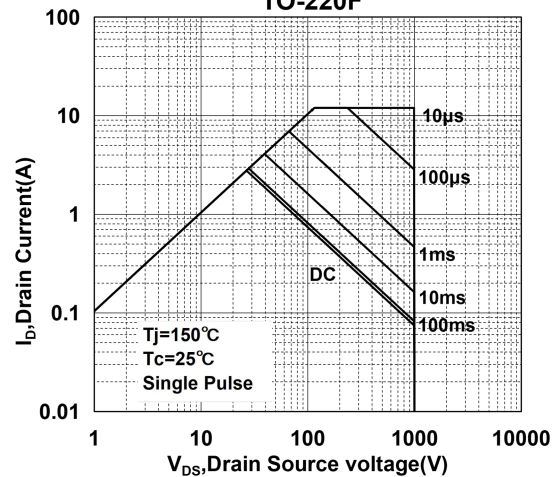
Normalized Maximum avalanche energy vs temperature



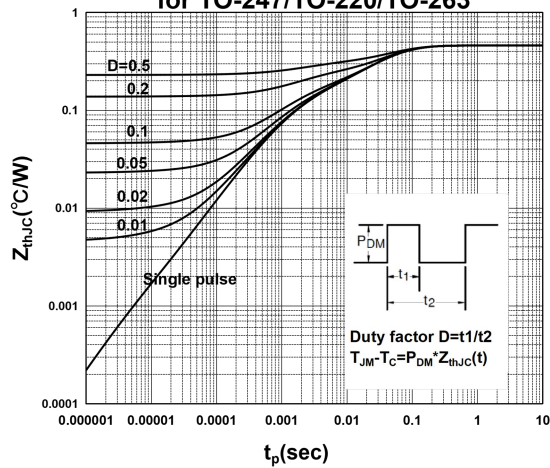
Transient Thermal Response Curve for TO-220F



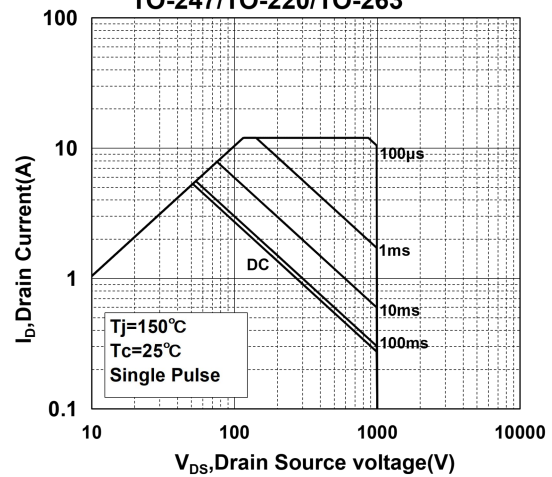
Safe Operating Area for TO-220F



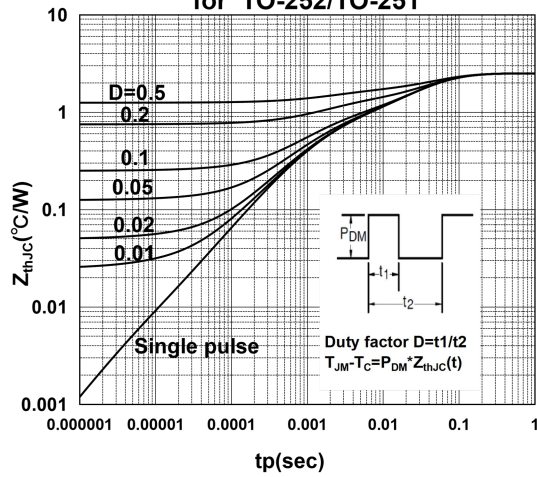
Transient Thermal Response Curve for TO-247/TO-220/TO-263



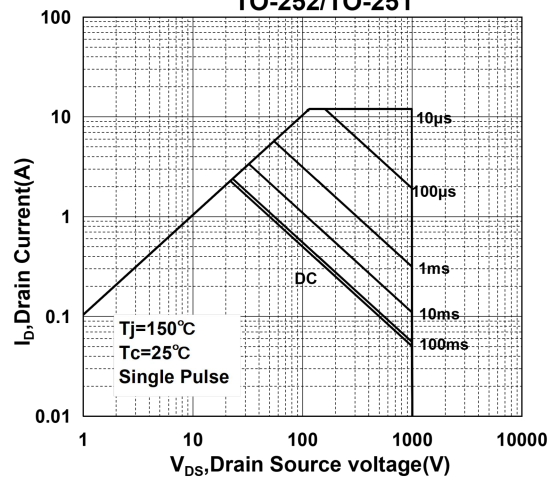
Safe Operating Area for TO-247/TO-220/TO-263



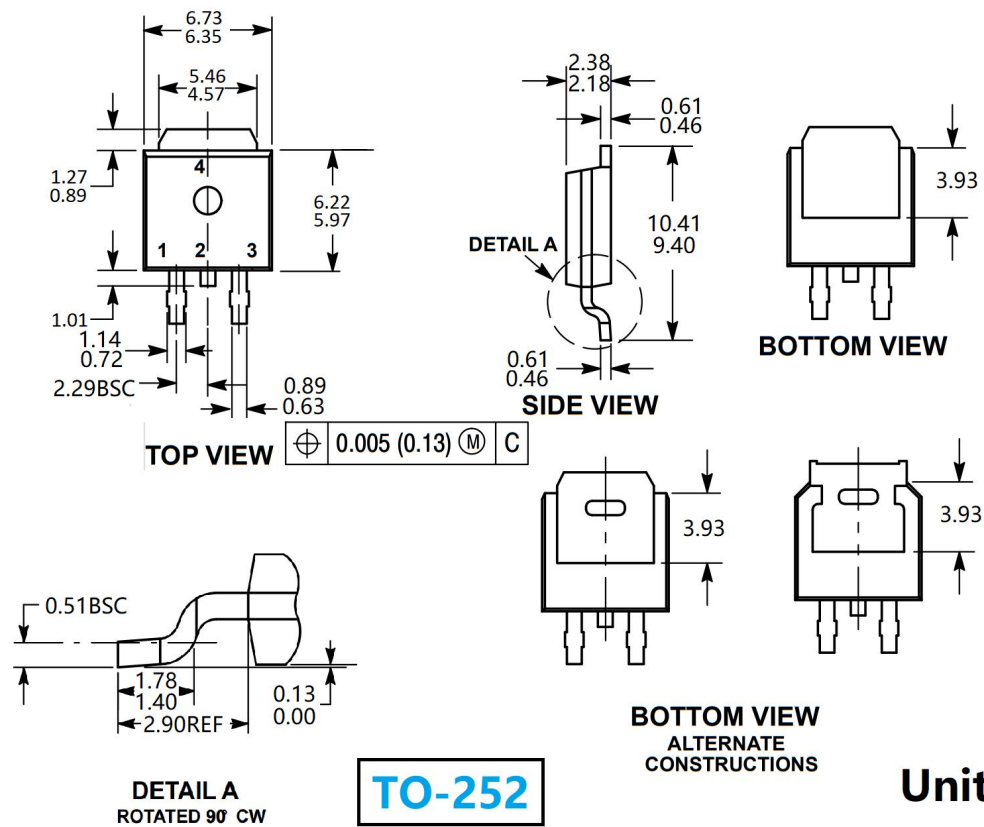
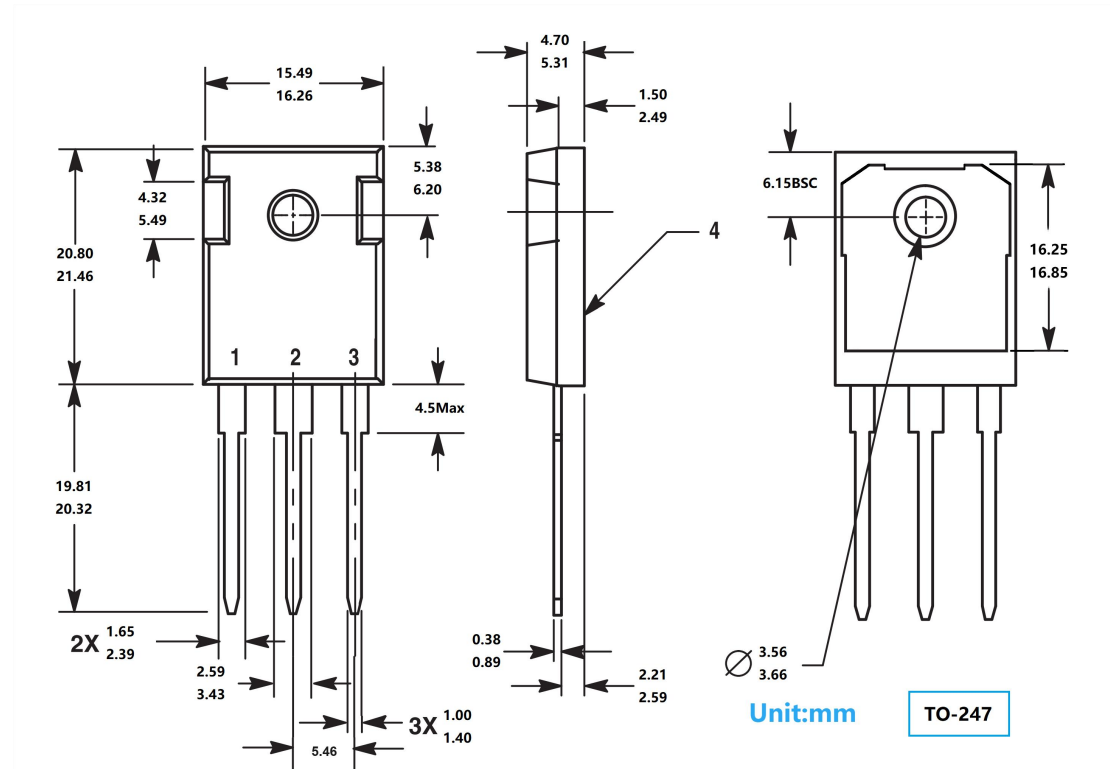
Transient Thermal Response Curve for TO-252/TO-251

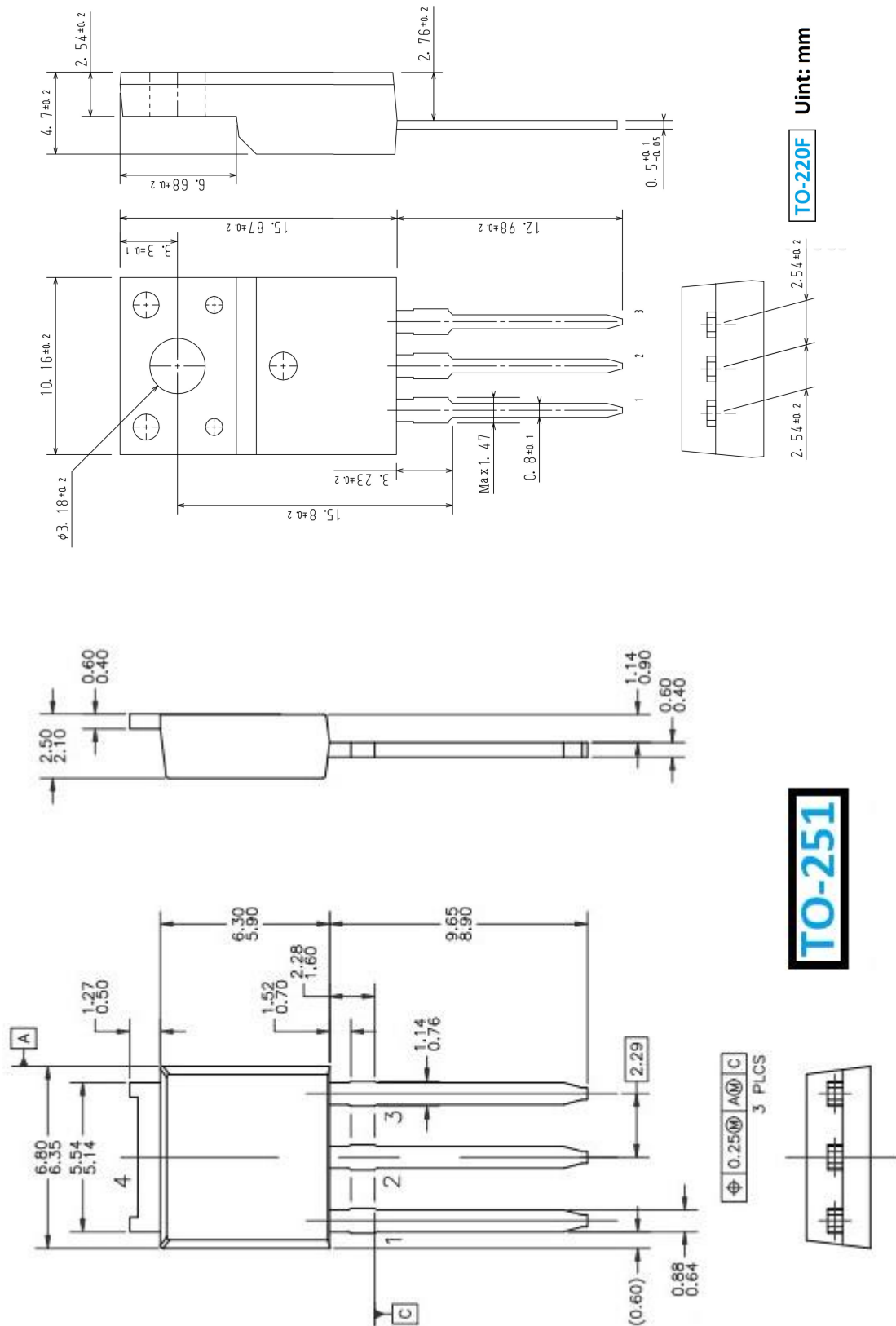


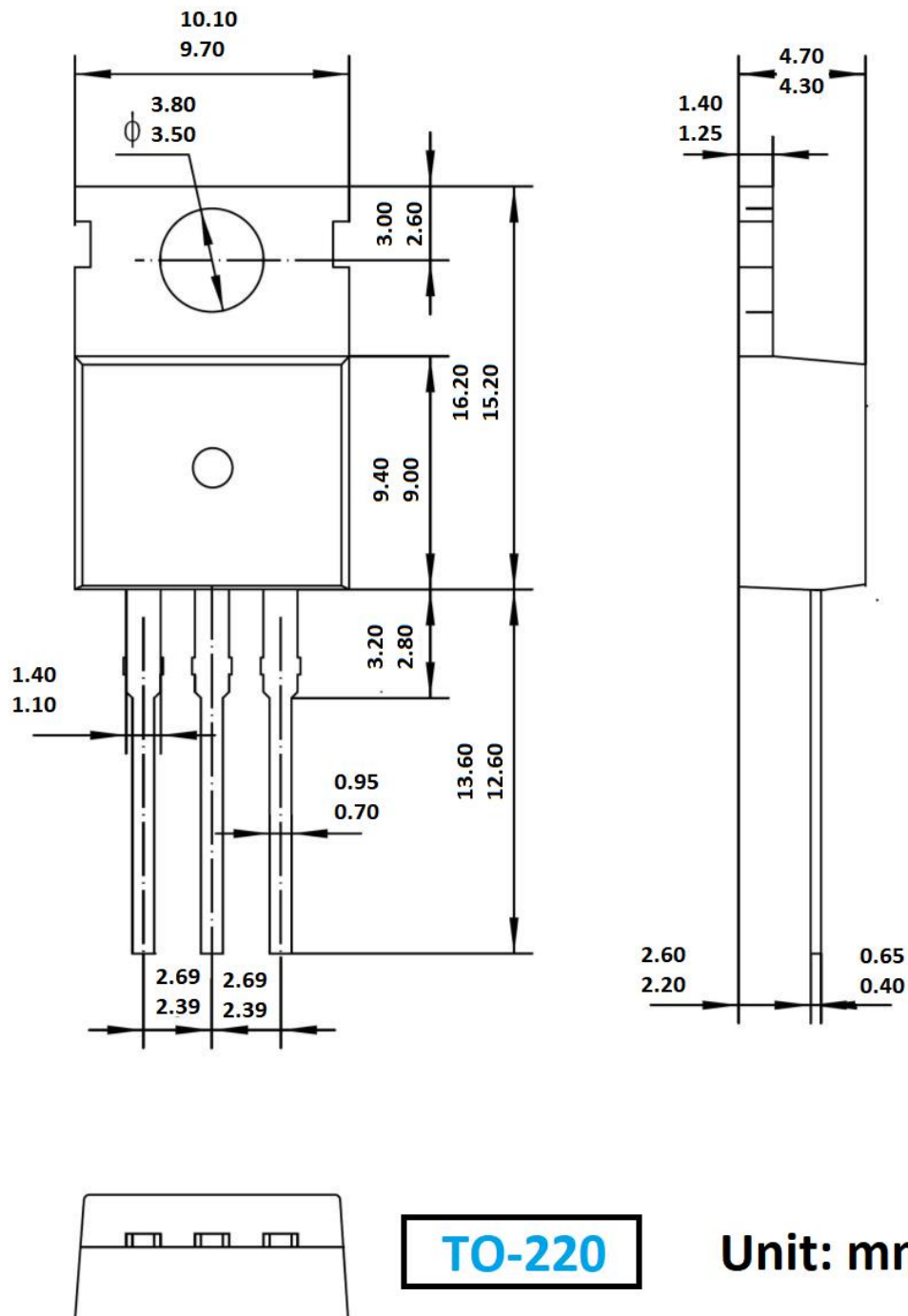
Safe Operating Area for TO-252/TO-251

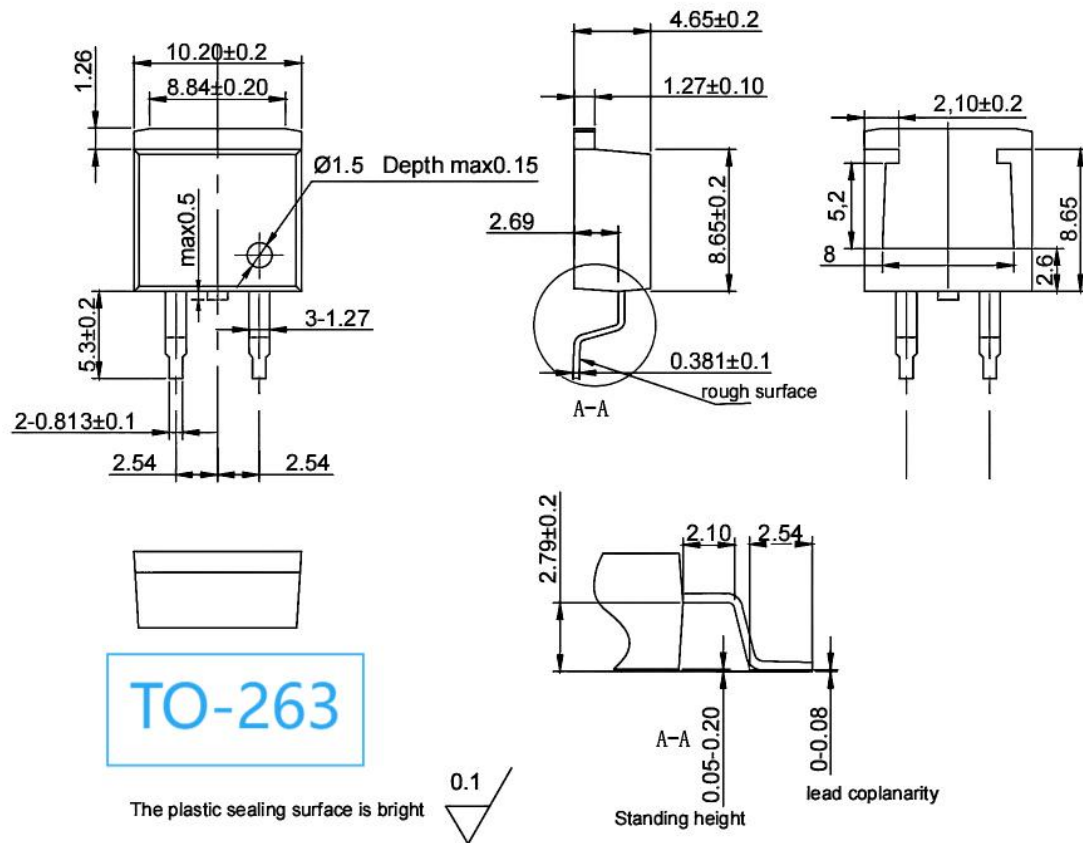


Package outline dimension









Notes:

1. unmarked tolerance±0.15mm;unmarked R<0.15mm
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. The top pinhole is not allowed to protrude the surface of the plastic sealing body
5. Unit: mm