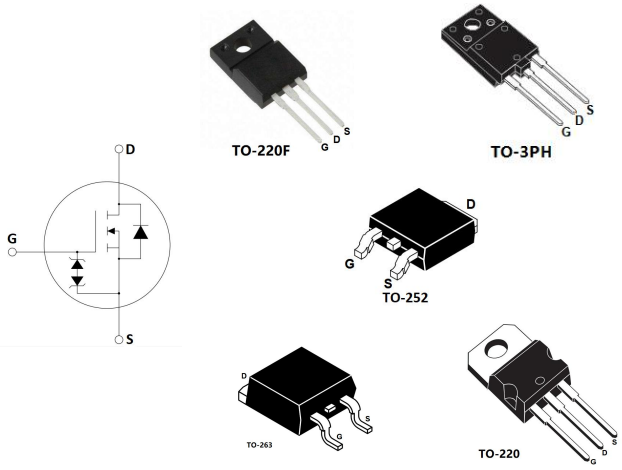
Features

- Extremely high dv/dt capability
- 100% avalanche tested
- Gate charge minimized
- Very low intrinsic capacitances
- Very good manufacturing repeatibility



Applications

- Switching application

Electrical ratings(Absolute maximum ratings)

Parameter	Symbol	Value				Unit
		TO-3PH	TO-220F	TO-252	TO-220/ TO-263	
Drain-source voltage（V_{GS}=0)	V_{DS}	1000				V
Transient Gate-source voltage	V_{GSM}	±30				
Continuous Gate-source voltage	V_{GSS}	±20				
Avalanche current repetitive or not-repetitive (pulse width limited by Tj Max)	I_{AR}	5				A
Single pulse avalanche energy (starting Tj=25℃ I_d=I_{AR} V_{dd}=50V)	E_{AS}	583				mJ
Drain current（continuous）at TC=25℃	I_D	5				A
Drain current（continuous）at TC=100℃	I_D	3				
Drain current（pulsed）	I_{DM}	18	18	18	18	
Total dissipation at TC=25℃	P_D	74	48	104	198	W
Operating junction temperature	T_J	-55 to 150				℃
Storage temperature	T_{STG}					
Maximum lead temperature for soldering purpose	T_L	300				℃

Electrical Characteristics(T_j=25℃ 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 (VGS=0)	I_{DSS}	V_{DS}=Max rating			1	μA
		T_C=125℃			50	μA
Gate body leakage current (VGS=0)	I_{GSS}	V_{GS}=±20V			±100	nA
Gate threshold voltage	$V_{GS(th)}$	V_{DS}=V_{GS} I_D=250μA	2.0	-	5.0	V
Static drain-source on resistance	$R_{DS(on)}$	V_{GS}=10V I_D=1A		3.5	4.2	Ω
Forward transconductance	g_{fs}	V_{DS} = 27 V, I_D = 5A		5.6		S
Dynamic						
Parameter	**Symbol**	**Test conditions**	**Min**	**Typ**	**Max**	**Unit**
Input capacitance	C_{iss}	V_{DS}=25V,f=1MHz,V_{GS}=0		506		pF
Output capacitance	C_{oss}			59		
Reverse transfer capacitance	C_{rss}			3		
Total gate charge	Q_g	V_{DD}=800V, I_D=2.5A V_{GS}=10V, R_G = 4.7 Ω		18.68		nC
Gate-source charge	Q_{gs}			2.1		
Gate-drain charge	Q_{gd}			7.3		
Switching times						
Parameter	**Symbol**	**Test conditions**	**Min**	**Typ**	**Max**	**Unit**
Turn-on delay time	$t_{d(on)}$	V_{DD} = 800 V, I_D = 2.5 A, R_G = 25Ω, V_{GS} = 10 V		35.6		ns
Rise time	t_r			22.9		
Turn-off-delay time	$t_{d(off)}$			42.7		
Fall time	t_f			13.6		
Source Drain Diode						
Parameter	**Symbol**	**Test conditions**	**Min**	**Typ**	**Max**	**Unit**
Source Drain Current	I_{SD}			5		A
Source Drain Current(Pulsed)	I_{SDM}			18		A
Forward On Voltage	V_{SD}	I_{SD}=5A,V_{GS}=0V		0.8	1.2	V

Reverse Recovery Time	T_{rr}	I_{SD}=5A, di/dt=200A/μs		1.02		us
Reverse Recovery Charge	Q_{rr}	V_R=100V,Tj=150℃		3.68		uC

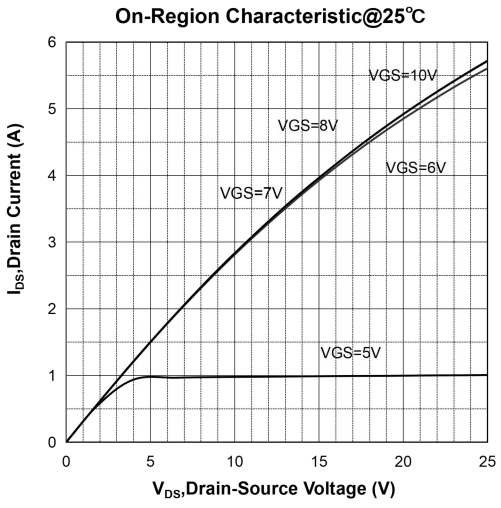
Thermal Characteristics

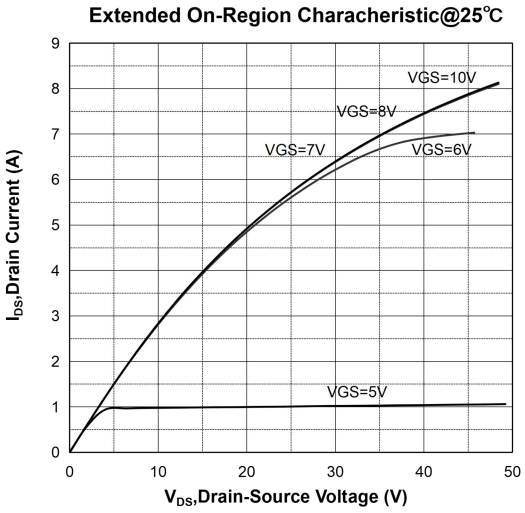
Parameter	Symbol	Value				Unit
		TO-3PH	TO-220F	TO-252	TO-220/ TO-263	
Thermal resistance junction,max	R_{thj-c}	1.69	2.6	1.2	0.63	℃/W
Thermal resistance junction-ambient,max	R_{thc-a}	47.4	58	68	35	℃/W

Order codes

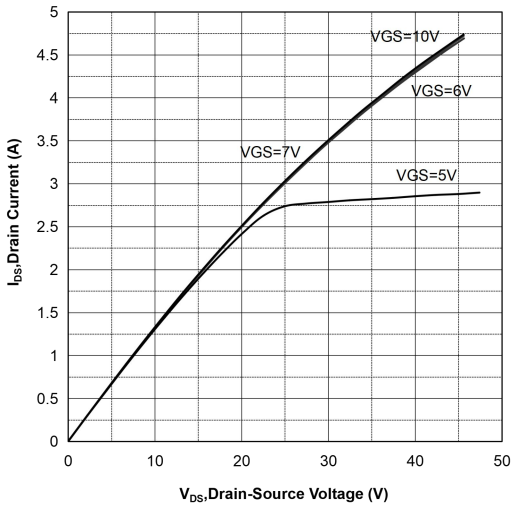
Part number	Marking	Package
MS5N100	MS5N100	TO-3PH
MS5N100S	MS5N100S	TO-220F
MS5N100FT	MS5N100FT	TO-220
MS5N100FE	MS5N100FE	TO-263/D2PAK
MS5N100FD	MS5N100FD	TO-252/DPAK

Electrical characteristics (curves)

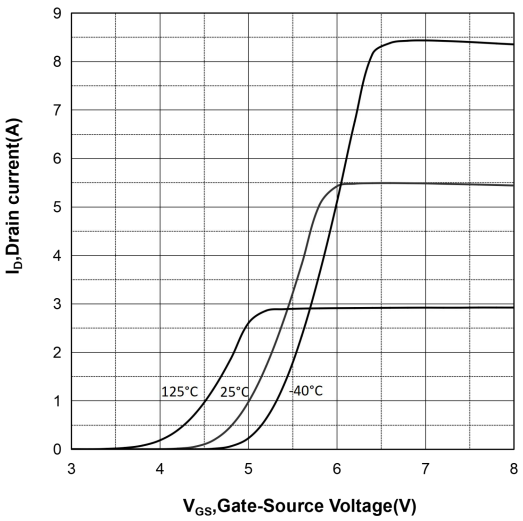




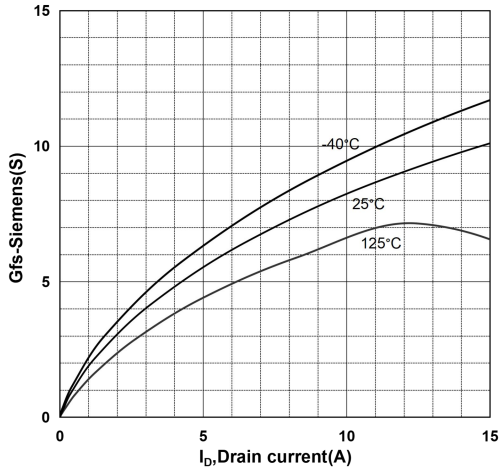
On-Region Characteristic@125℃



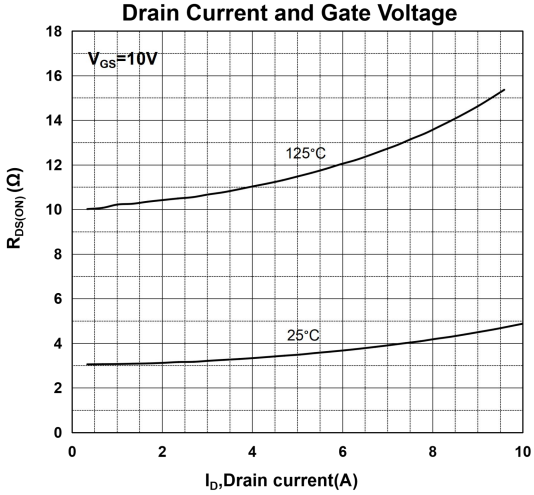
Transfer Characteristics



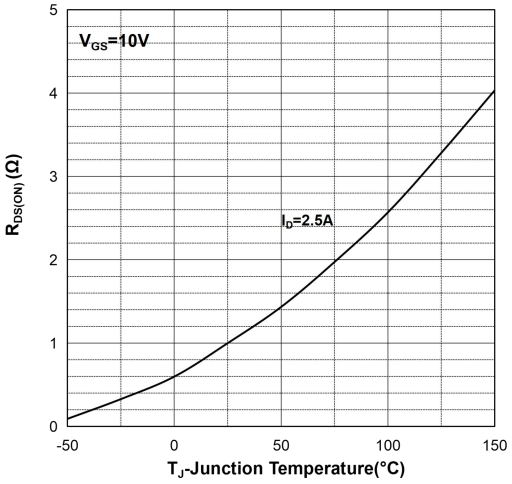
Transconductance



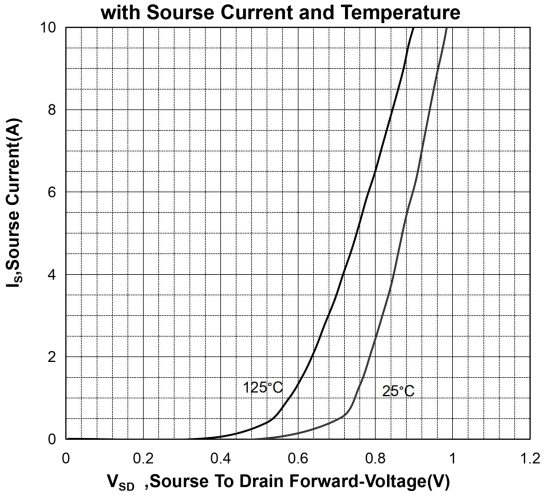
On-Resistance Variation vs Drain Current and Gate Voltage



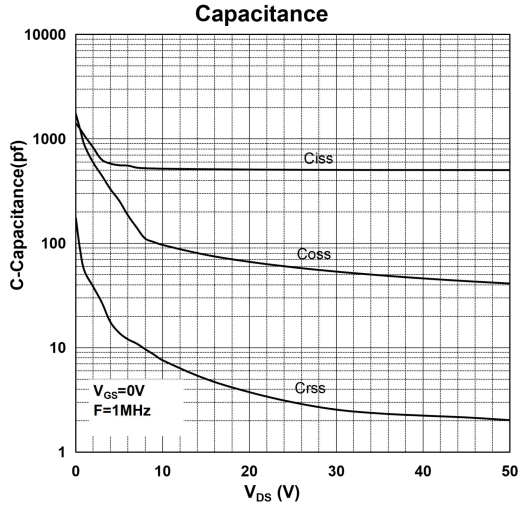
On-Resistance Variation vs Temperature



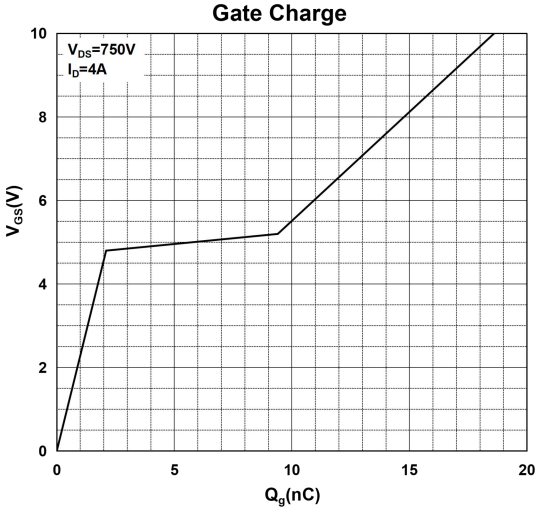
Body Diode Forward Voltage Variation with Sourse Current and Temperature



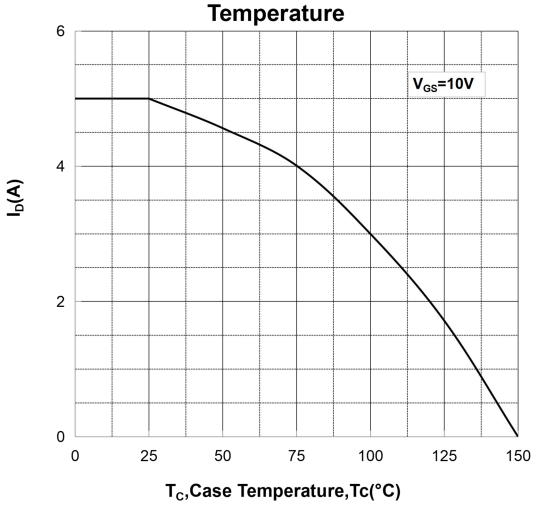
Capacitance



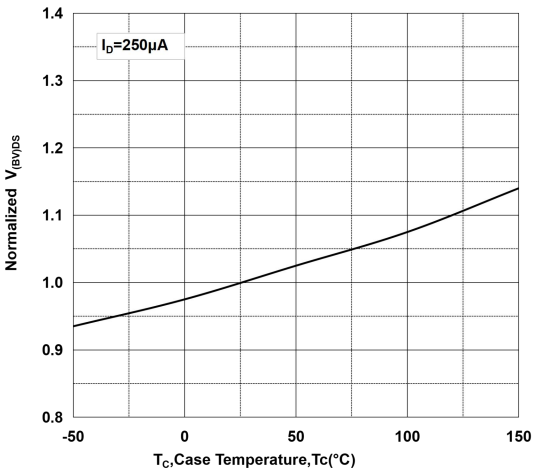
Gate Charge



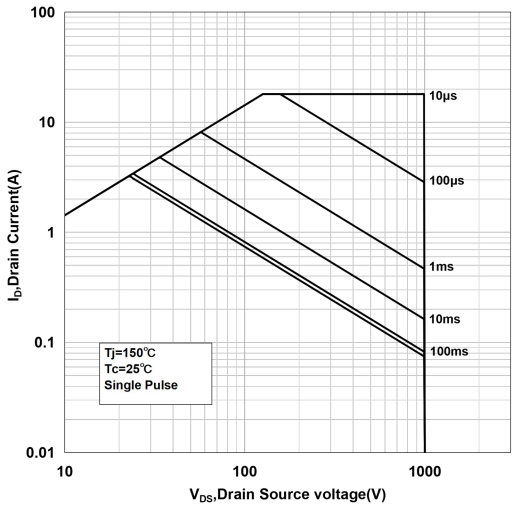
Maximum Drain Current vs Case Temperature



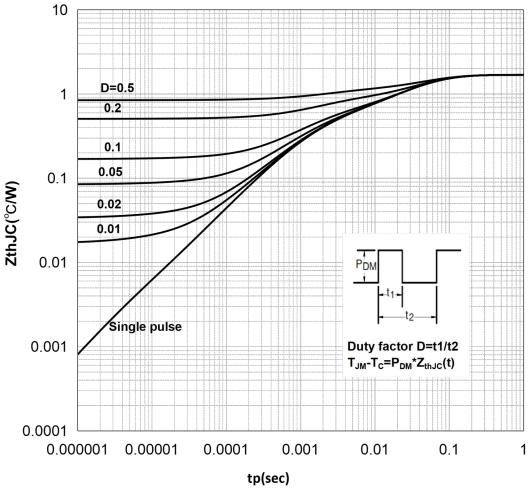
Normalized $V_{(BV)DS}$ vs temperature



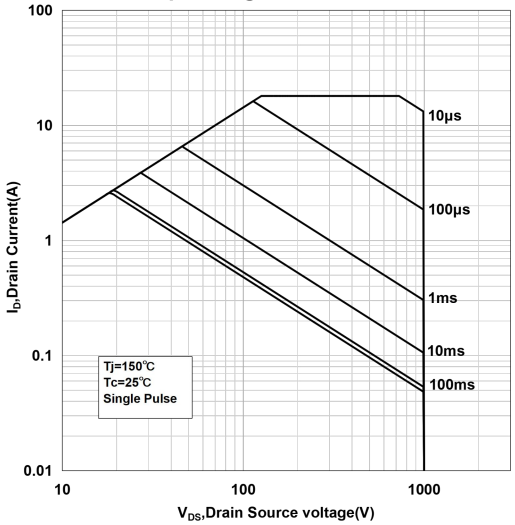
Safe Operating Area for TO-3PH



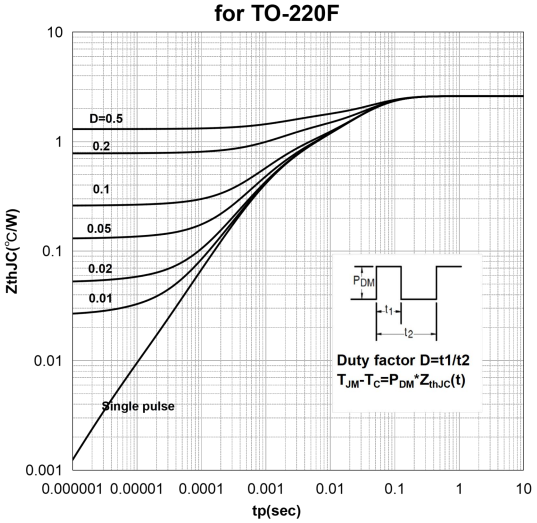
Transient Thermal Response Curve for TO-3PH



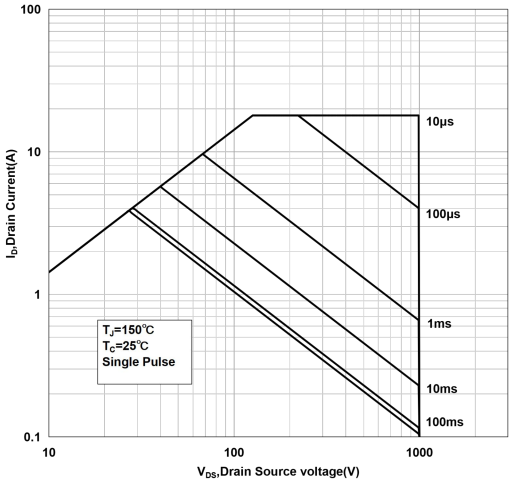
Safe Operating Area for TO-220F



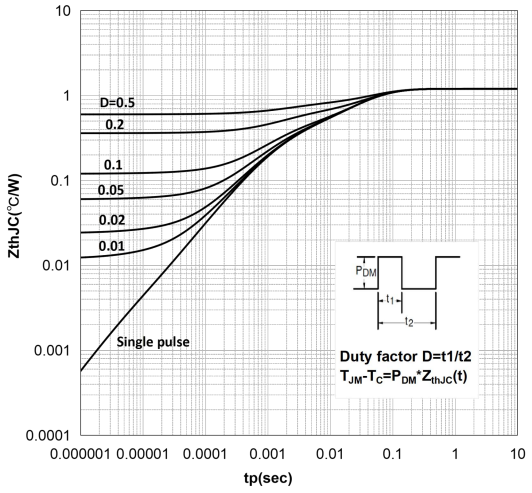
Transient Thermal Response Curve for TO-220F



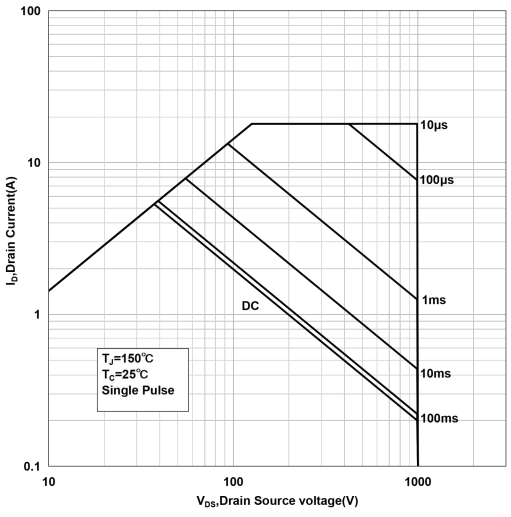
Safe Operating Area for TO-252



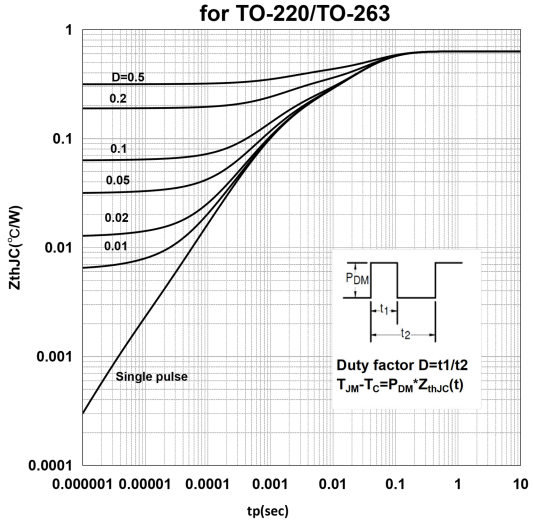
Transient Thermal Response Curve for TO-252



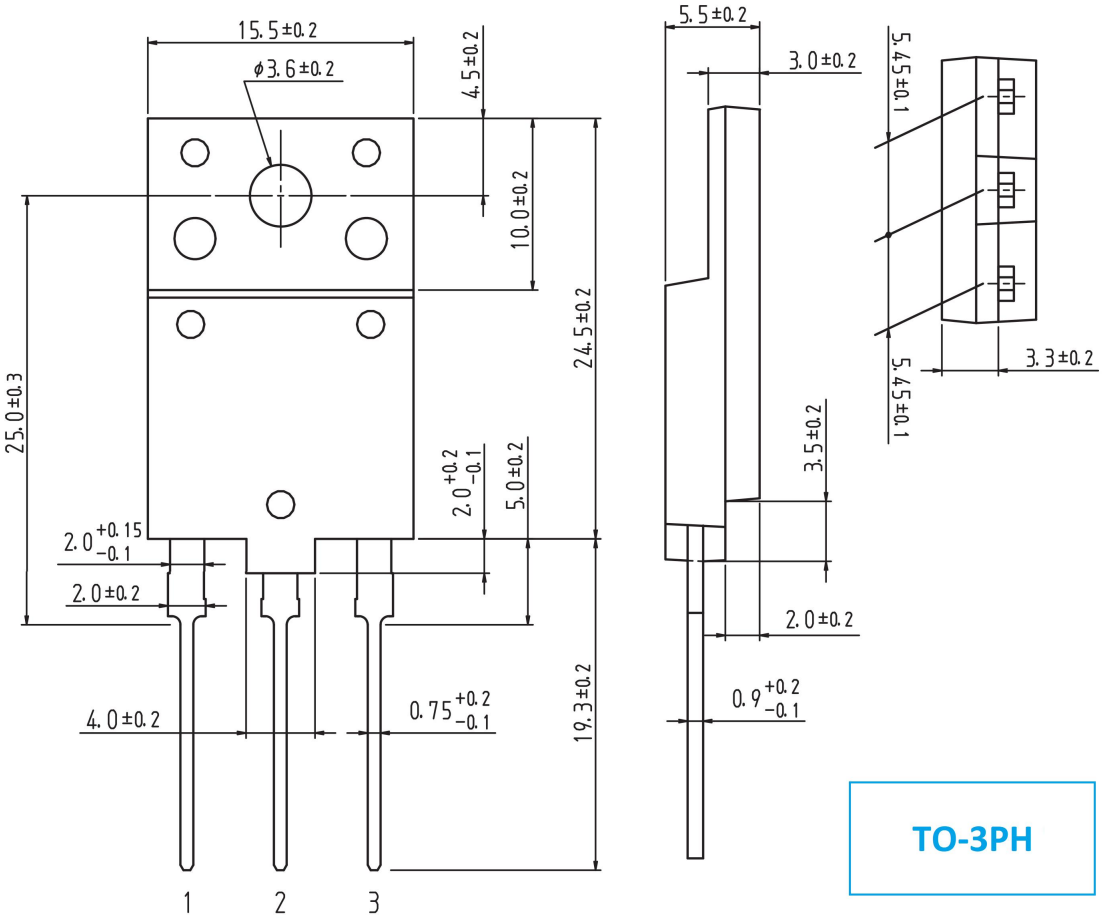
Safe Operating Area for TO-220/TO-263

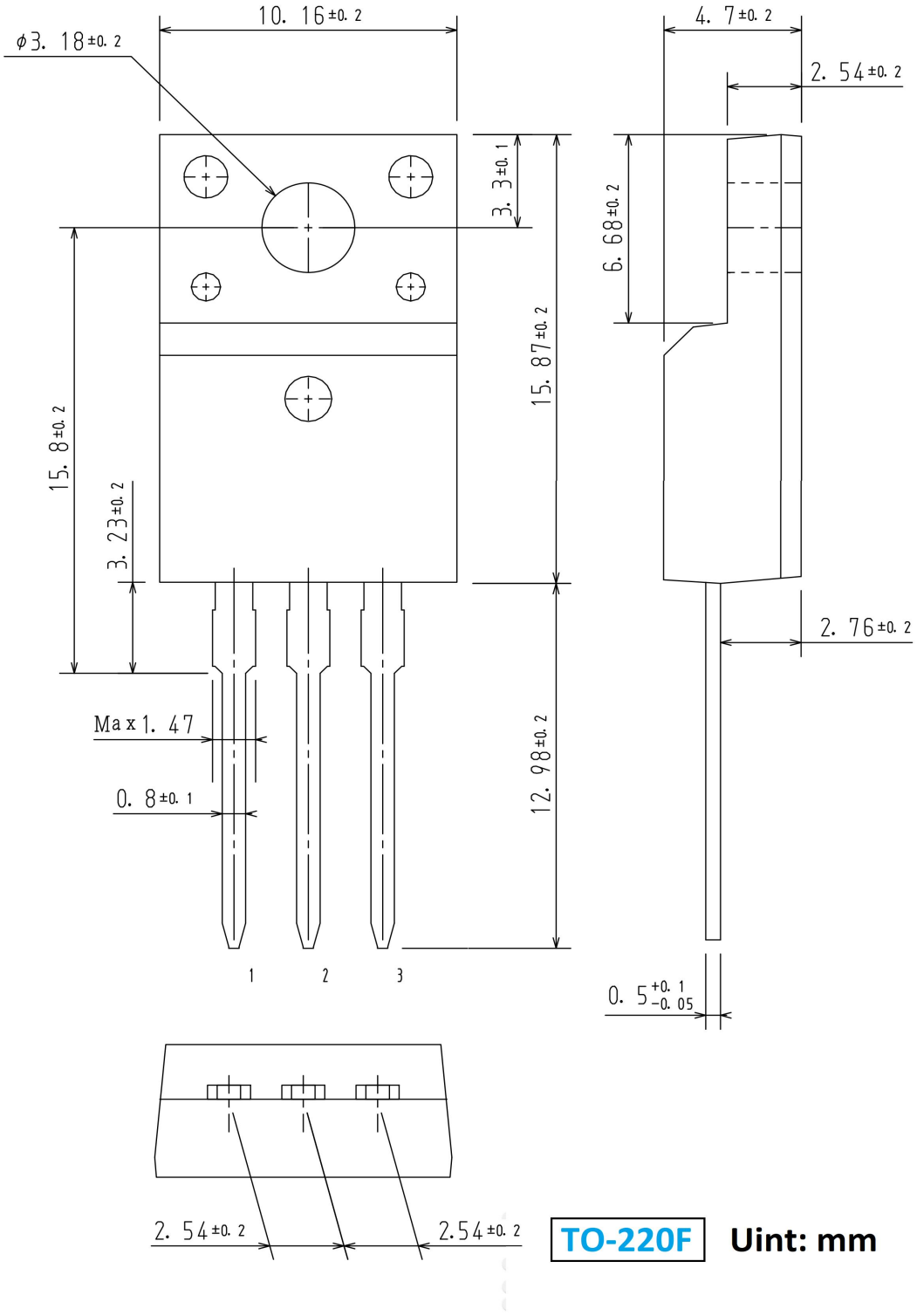


Transient Thermal Response Curve for TO-220/TO-263

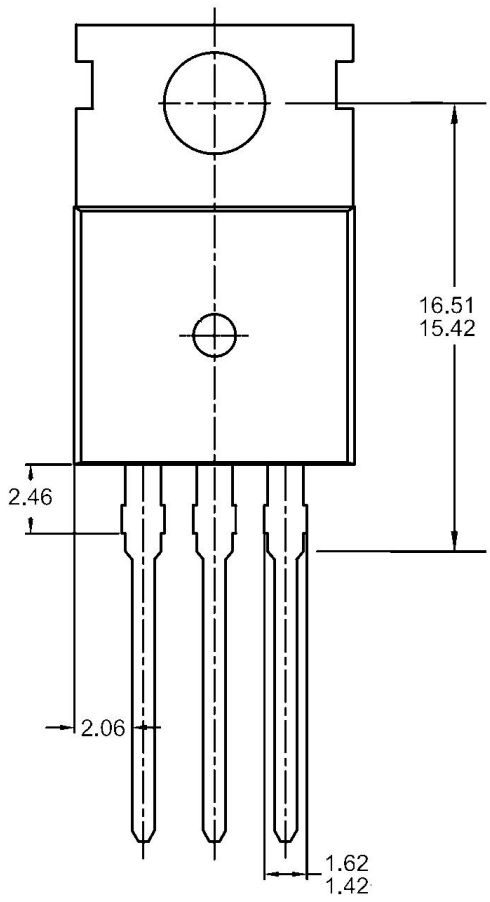


Package outline dimension

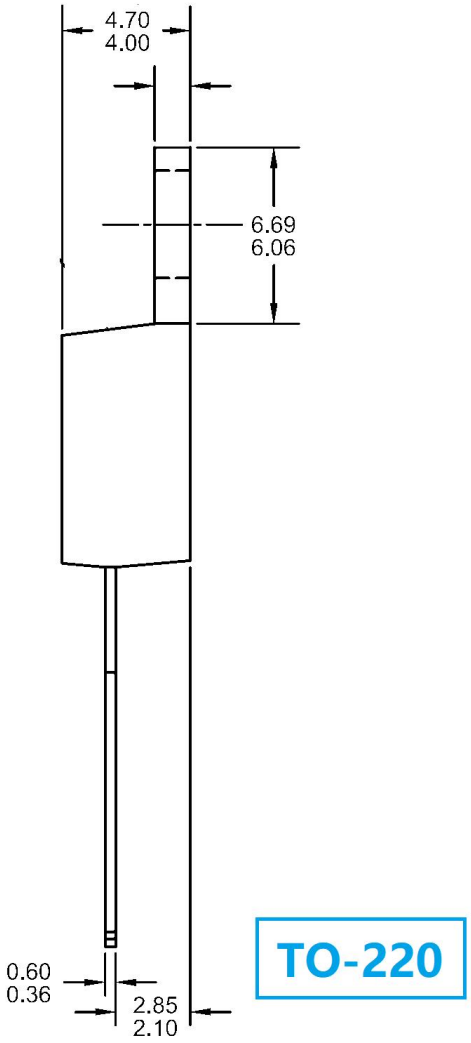


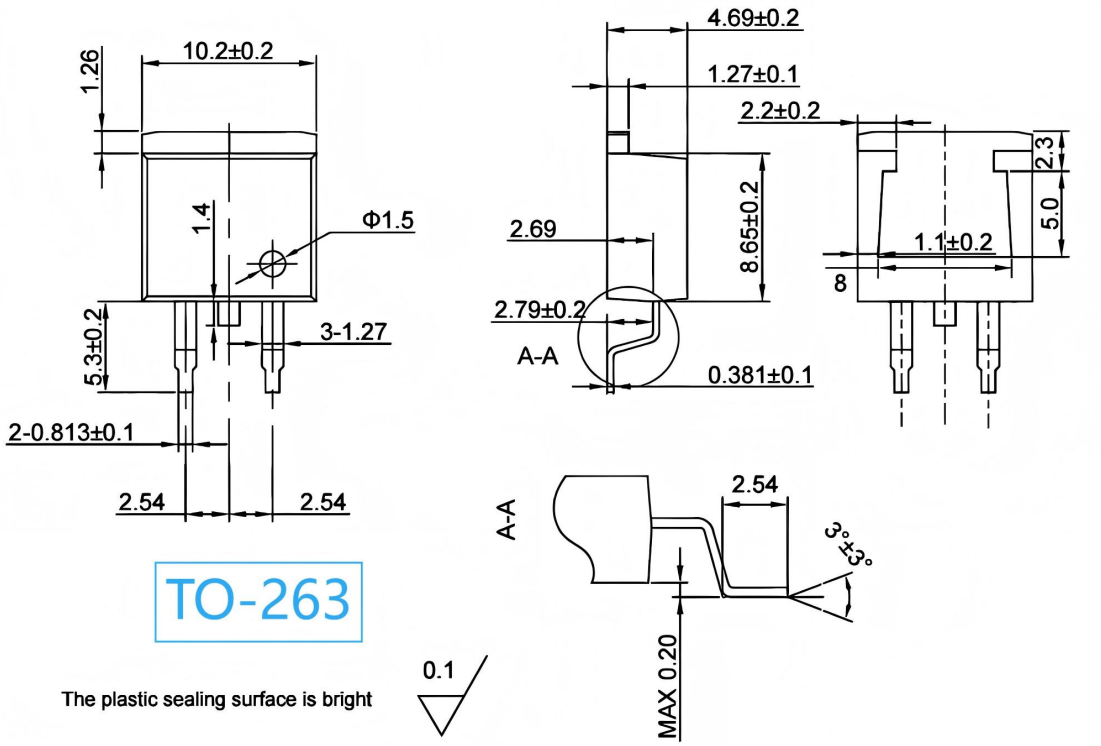


TO-220F **Uint: mm**



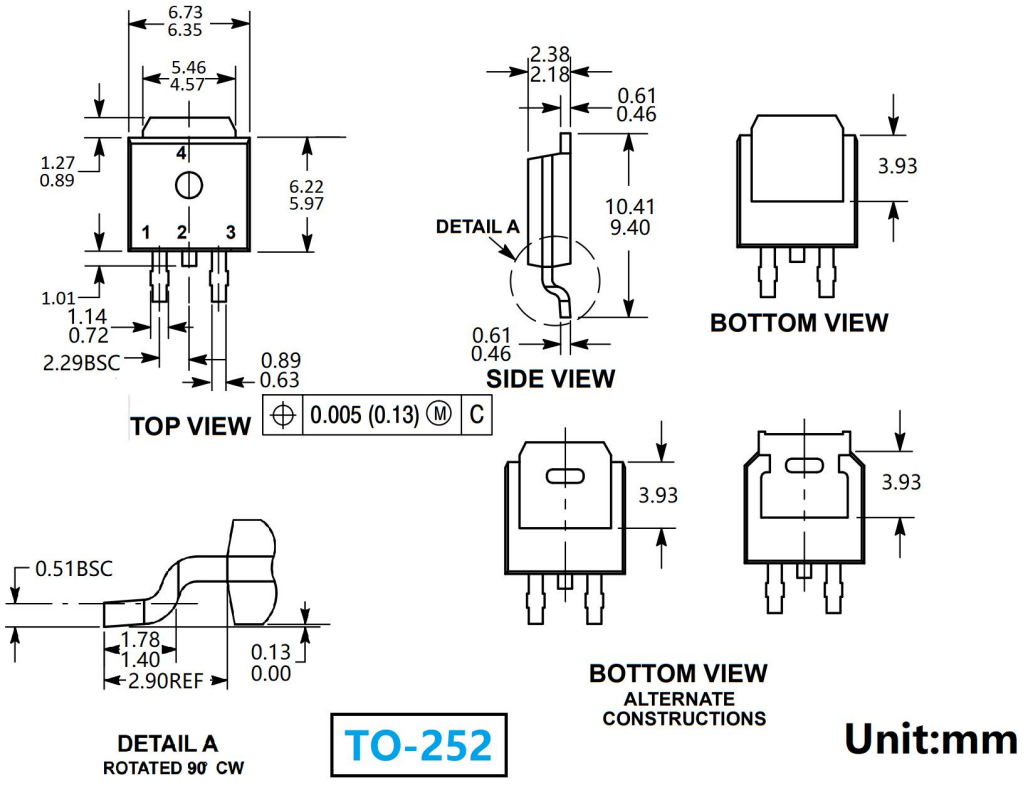
TO-220





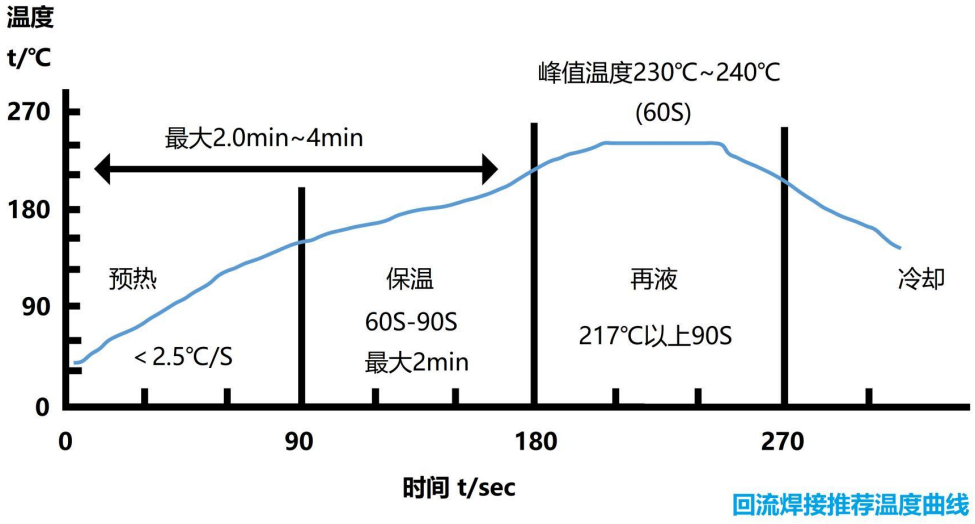
Notes:

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. Unit : mm



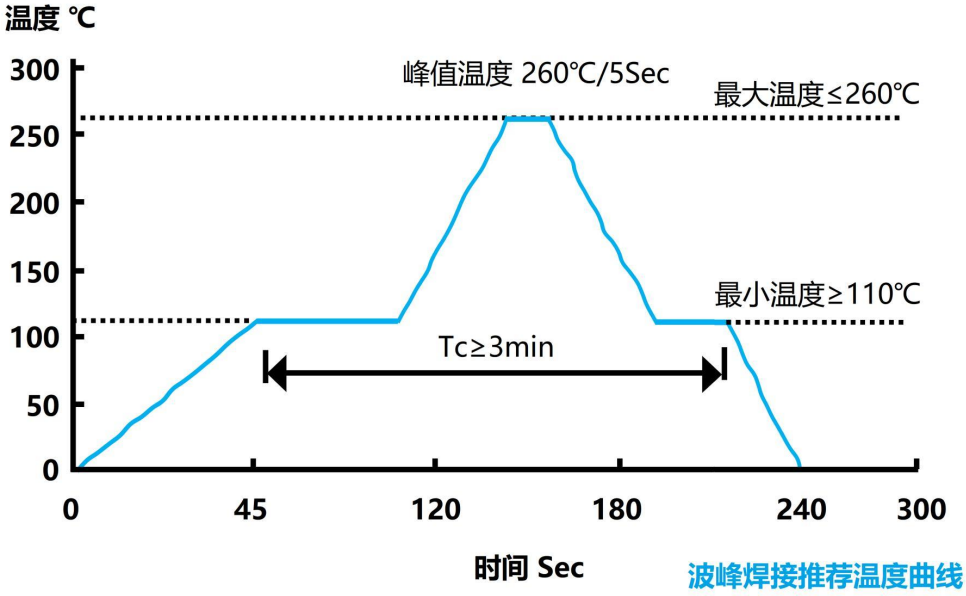
Welding temperature curve ：

- Reflow Solder temperature curve(MSL 3，SMD)



回流焊接推荐温度曲线

- Wave soldering temperature curve(Tube)



波峰焊接推荐温度曲线