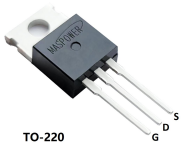
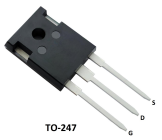
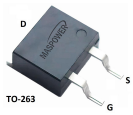
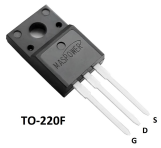
Features

- Low gate charge
- Low C_{rss} (typ 12pF)
- Fast switching
- 100% avalanche tested
- Improved dv/dt capability
- RoHS product



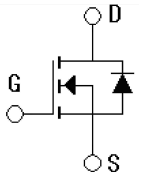






Applications

- High frequency switching mode power supply
- Electronic ballast based on half bridge
- LED power supplies



Absolute Ratings (Tc=25℃)

Parameter	Symbol		Value	Unit
Drain-Source Voltage	V_{DSS}		1000	V
Transient Gate-Source Voltage	V_{GSM}		±30	V
Continuous Gate-Source Voltage	V_{GSS}		±20	V
Drain Current-continuous	I_D	T_C=25℃	12	A
		T_C=100℃	8	A
Drain Current-pulse (note 1)	I_{DM}		20	A
Single pulse avalanche energy (note 2)	E_{AS}		1166	mJ
Avalanche Current（note 1）	I_{AR}		3	A
Repetitive Avalanche Energy	E_{AR}		90	mJ
Power Dissipation (MS12N100FC/FT)	P_D	T_C=25℃	312	W
		T_C=100℃	125	W
Power Dissipation (MS12N100FE)	P_D	T_C=25℃	100	W
		T_C=100℃	40	W
Power Dissipation (MS12N100FS)	P_D	T_C=25℃	67	W
		T_C=100℃	27	W
Operating and Storage Temperature Range	T_J,T_{STG}		-55~+150	℃
Maximum Lead Temperature for Soldering Purposes	T_L		300	℃

Electrical Characteristics(T_{CASE}=25℃ unless otherwise specified)

Parameter	Symbol	Tests conditions	Min	Type	Max	Units
Drain-Source Voltage	BV_{DSS}	I_D=250μA,V_{GS}=0V	1000	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=V_{DSS},V_{GS}=0V，T_C=25℃	-	-	1	μA
		V_{DS}=V_{DSS},T_C =125℃	-	-	10	μA
Gate body leakage current	I_{GSS}	V_{DS}=0V,V_{GS}=±20V	-	-	±100	nA
On-Characteristics						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=250μA	2.0	-	4.0	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=10V,I_D=1A，T_C=25℃(note 3)	-	1.0	1.2	Ω
Forward Transconductance	g_{FS}	V_{DS}=40V,I_D=6A (note 3)	-	16	-	S
Dynamic Characteristics						
Input capacitance	C_{iss}	V_{DS}=25V, V_{GS}=0V, f=1.0MHz(note 4)	-	1584	-	pF
Output capacitance	C_{oss}		-	166	-	pF
Reverse transfer capacitance	C_{rss}		-	12	-	pF

Electrical Characteristics(T_{CASE}=25℃ unless otherwise specified)

Parameter	Symbol	Tests conditions	Min	Type	Max	Units
Switching-Characteristics						
Turn-On delay time	$t_{d(on)}$	V_{DD}=600V,I_D=12A, R_{GEN}=25Ω	-	24	-	ns
Turn-On rise time	t_r		-	46	-	ns
Turn-Off delay time	$t_{d(Off)}$		-	118	-	ns
Turn-Off rise time	t_f		-	58	-	ns
Total Gate Charge	Q_g	V_{DS}=800V,I_D=12A, V_{GS}=10V (note 4)	-	41	-	nC
Gate-Source charge	Q_{gs}		-	9	-	nC
Gate-Drain charge	Q_{gd}		-	16	-	nC

Drain-Source Diode Characteristics and Maximum Ratings						
Diode Forward Voltage (note 3)	V_{SD}	V_{GS}=0V,I_S=1A (note 3)	-	-	1.2	V
Maximum Pulsed Drain-Source Diode Forward Current	I_{SM}	-	-	-	110	A
Maximum Continuous Drain Source Diode Forward Current	I_S	-	-	-	12	A
Reverse recovery time	t_{rr}	V_{GS}=0V, I_S=8A dI_F/dt=100A/μs	-	620	-	ns
Reverse recovery charge	Q_{rr}		-	4.39	-	μC

Thermal Characteristic

Parameter	Symbol	Value			Unit
		MS12N100FC/FT	MS12N100FE	MS12N100FS	
Thermal Resistance,junction to Case	R_{th}(j-C)	0.4	1.25	1.84	℃/W
Thermal Resistance, Junction to Ambient	R_{th}(j-A)	36	62.5	62.5	℃/W

Order information

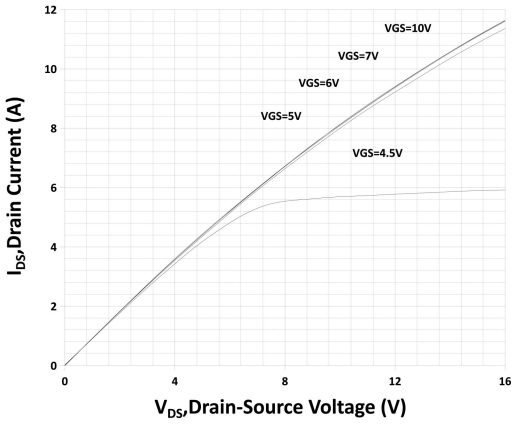
Order codes	Package	Packaging
MS12N100FC	TO-247	Tube
MS12N100FE	TO-263	Tube
MS12N100FT	TO-220	Tube
MS12N100FS	TO-220F	Tube

Notes:

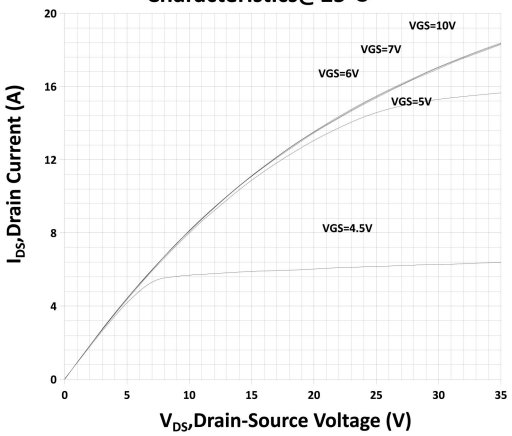
1. Pulse width limited by maximum junction temperature
2. L=15mH, I_{AS}=12A, V_{DD}=50V, R_G=25 Ω,Starting T_J=25℃
3. Pulse Test：Pulse Width ≤300μs,Duty Cycle≤2%
4. Essentially independent of operating temperature

ELECTRICAL CHARACTERISTICS (curves)

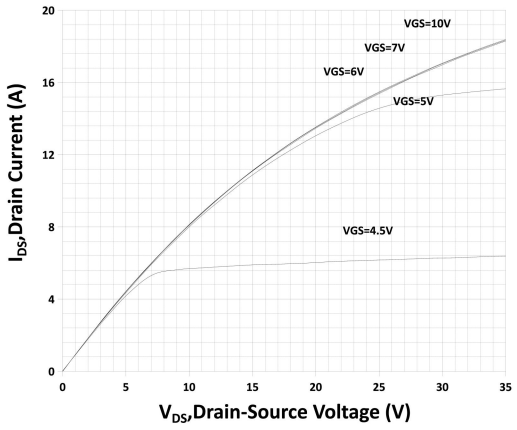
On-Region Characteristics@25℃



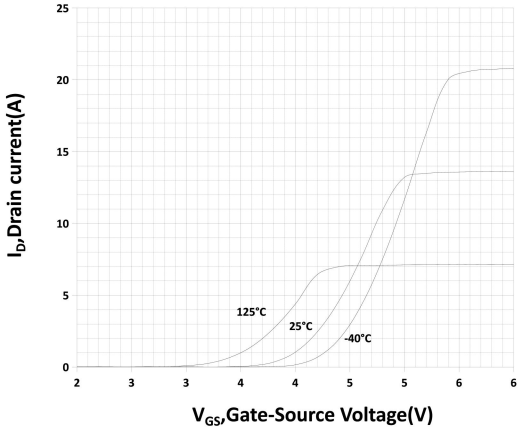
Extended On-Region Characteristics@25℃



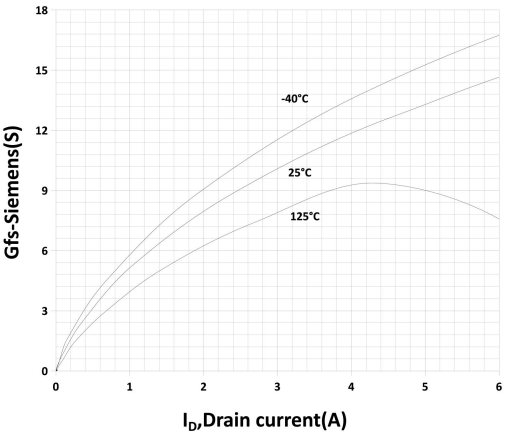
On-Region Characteristics@125℃



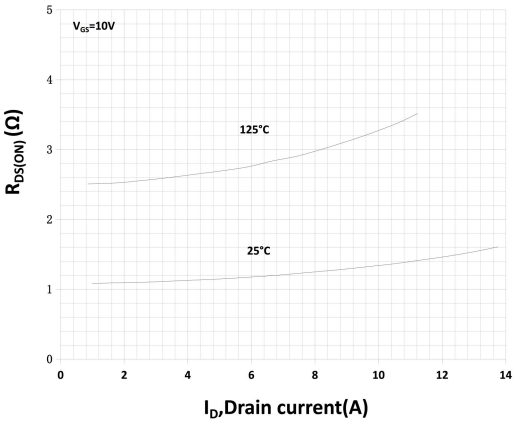
Transfer Characteristics



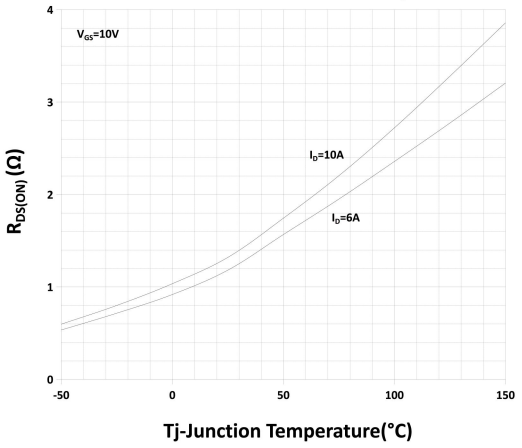
Transconductance



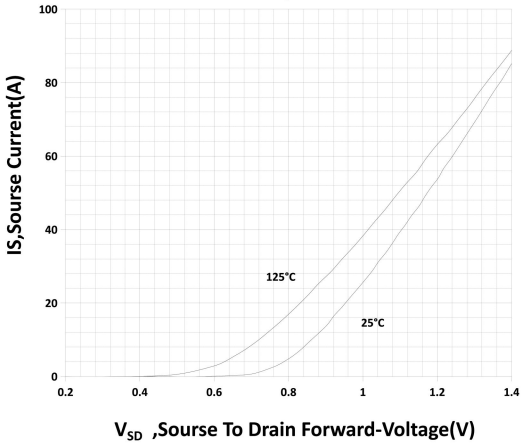
On-Resistance Variation vs Drain Current and Gate Voltage



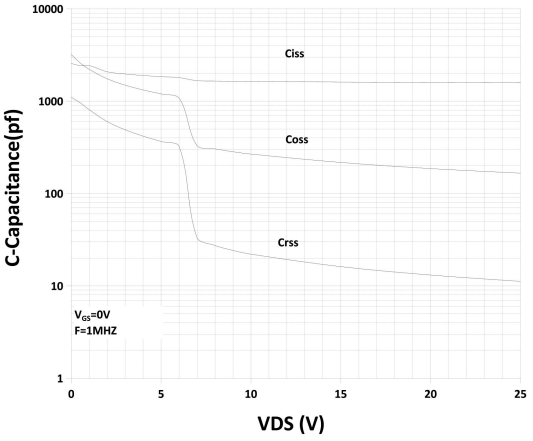
On-Resistance Variation vs Temperature



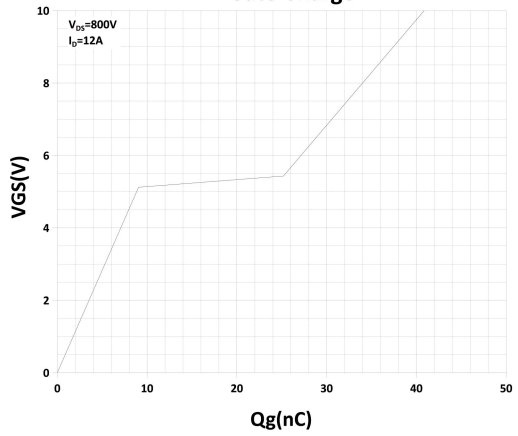
Body Diode Forward Voltage Variation with Source Current and Temperature



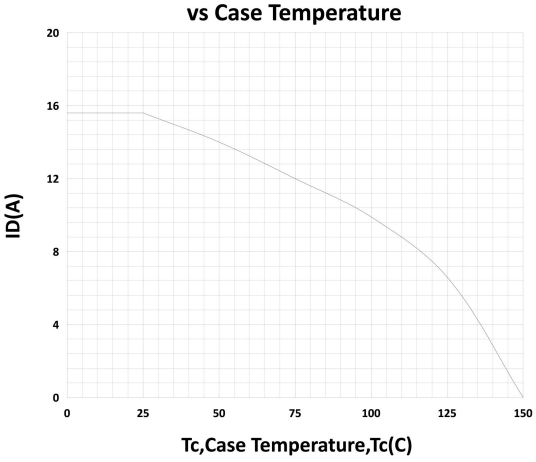
Capacitance



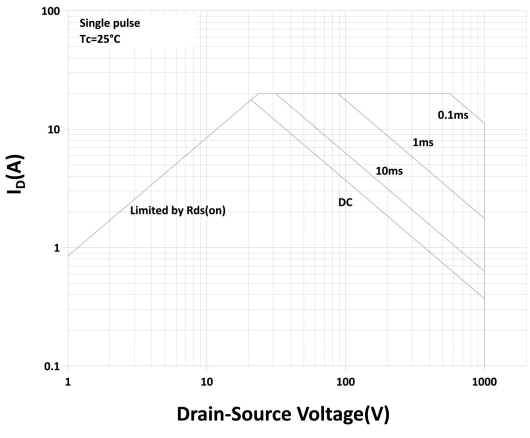
Gate Charge

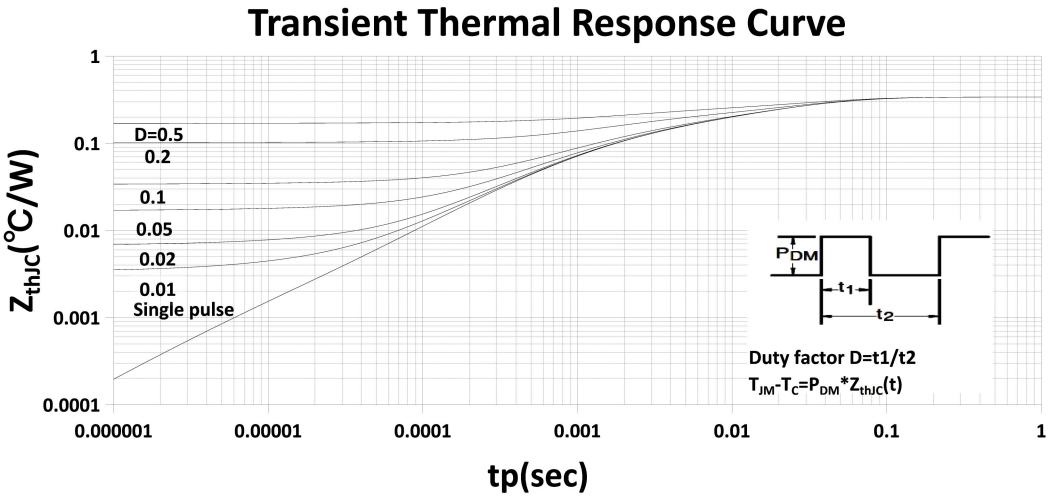


Maximum Drain Current vs Case Temperature

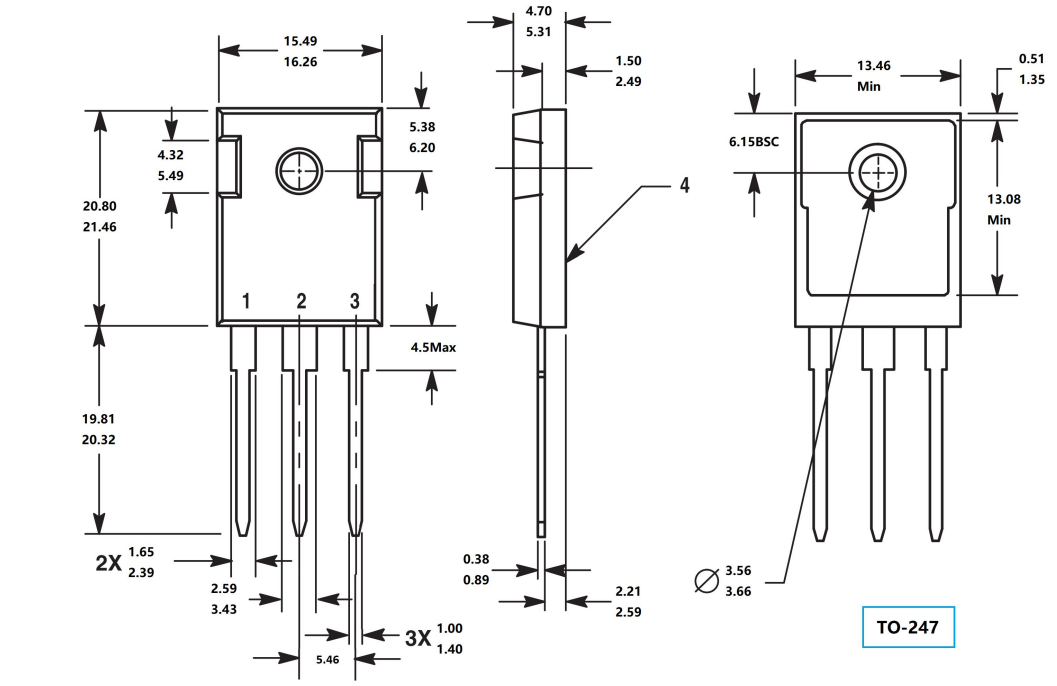


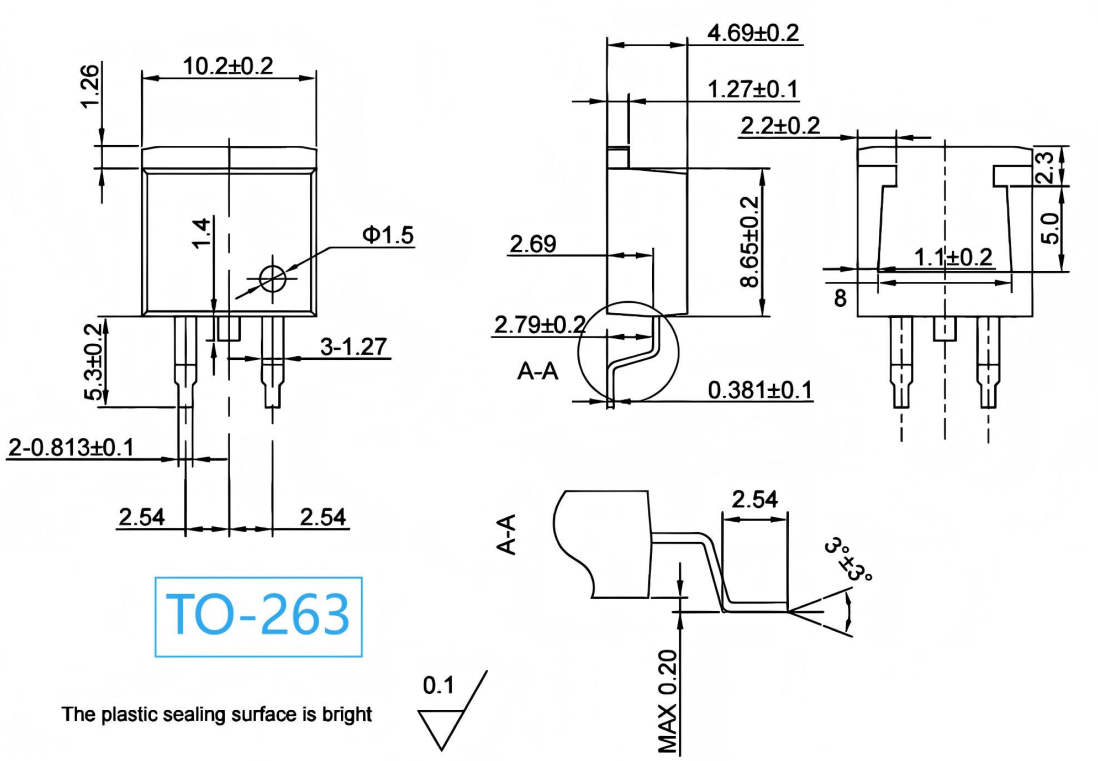
SOA




Transient Thermal Response Curve
1
0.1
0.01
0.001
0.0001
Z_{thJC}(°C/W)
D=0.5
0.2
0.1
0.05
0.02
0.01
Single pulse
P_{DM}
t_1
t_2
Duty factor D=t1/t2
T_{JM}-T_C=P_{DM}*Z_{thJC}(t)
0.000001
0.00001
0.0001
0.001
0.01
0.1
1
tp(sec)

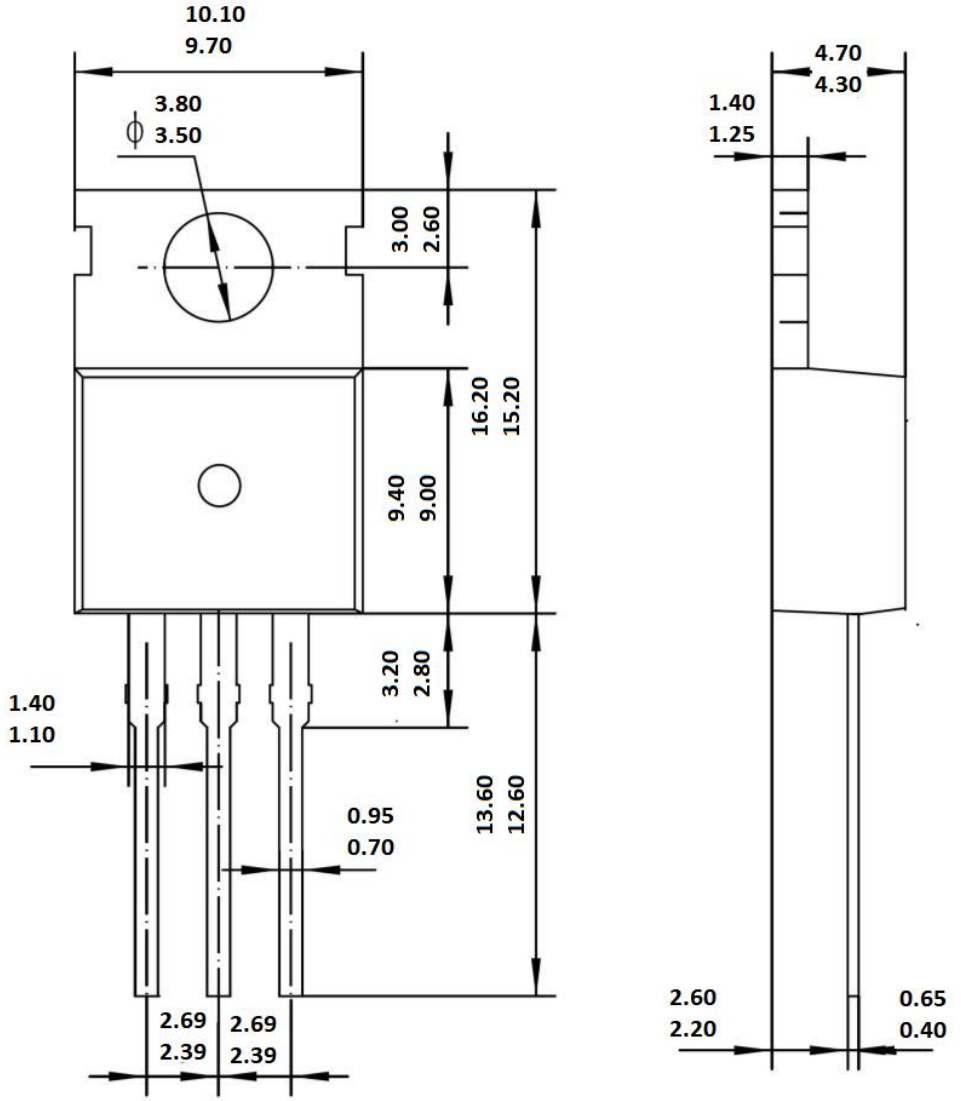
PACKAGE MECHANICAL DATA

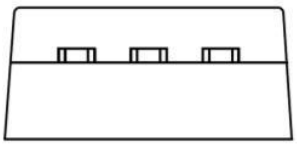




Notes:

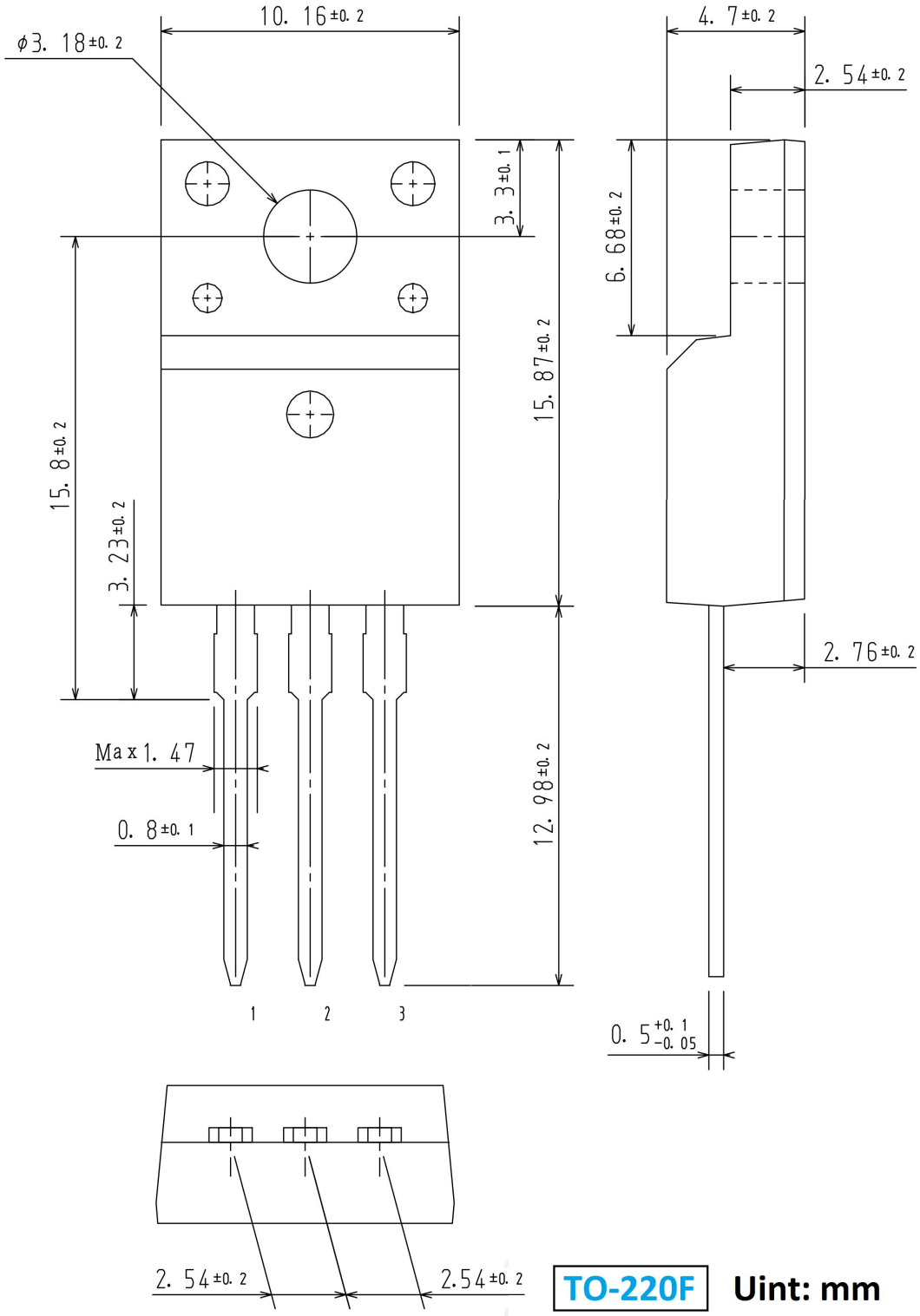
1. Unmarked tolerance±0.15mm;unmarked R<0.15mm
2. The resin body is not allowed to have defects, shrinkage holes, cracks, bubbles and other harmful defects
3. The drawing indicates that the leg has reinforcement
4. Unit : mm





TO-220

Unit: mm



TO-220F **Uint: mm**