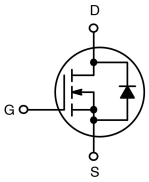
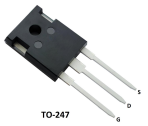
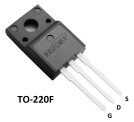
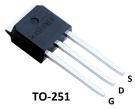
features

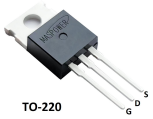
- Low gate charge (typical 12nC)
- Low Crss (typical 5.5pF)
- 100% avalanche tested
- Fast switching
- Improved dv/dt capability











Applications

- Switching application

Electrical ratings

Absolute maximum ratings

Parameter	Symbol	Value	Unit
Drain-source voltage（V_{GS}=0)	V_{DS}	1000	V
Gate-source voltage	V_{GS}	±30	
Drain current（continuous）at TC=25℃	I_D	3	A
Drain current（continuous）at TC=100℃	I_D	2.1	
Drain current（pulsed）	I_{DM}	12	A
Avalanche current repetitive or not-repetitive (pulse width limited by Tj Max)	IAR	3	A
Single pulse avalanche energy (starting Tj=25℃ Id=Iar Vdd=50V)	EAS	300	mJ
Total dissipation at TC=25℃(TO-247)	PD	272	W
Total dissipation at TC=25℃ (TO-252/TO-251)	PD	50	W
Total dissipation at TC=25℃（TO-220F）	PD	74	W
Total dissipation at TC=25℃（TO-220）	PD	60	W
Drain source ESD (HBM-C=100pF,R=1.5KΩ）	$V_{ESD(GS)}$	4000	V
Peak diode recovery voltage slope	dv/dt	4.5	V/ns
Insulation withstand voltage(RMS)from all three leads to external heat sink (t=1s TC=25℃）	V_{ISO}	2500	v
Operating junction temperature	T_J	-55 to 175	℃
Storage temperature	T_{STG}		

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

On/off states

Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
Drain-source breakdown voltage	V(BR)DSS	ID=1mA VGS=0	1000	-	-	V
Zero gate voltage drain current (VGS=0)	IDSS	VDS=Max rating	-	-	1	μA
		TC=125℃	-	-	100	μA
Gate body leakage current (VGS=0)	IGSS	VGS=±30V	-	-	±100	nA
Gate threshold voltage	VGS(th)	VDS=VGS ID=100μA	3.0	4.0	5.0	V
Static drain-source on resistance	RDS(on)	VGS=10V ID=1A	-	5.2	5.8	Ω

Dynamic

Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
Forward transconductance	g_{fs}	V_{DS} = 15 V, I_D = 1.75A	-	3	-	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 Ω, V_{GS} = 10 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

Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
Source Drain Current	I_{SD}		-	-	3	A
Source Drain Current(Pulsed)	I_{SDM}		-	-	12	A
Forward On Voltage	V_{SD}	I_{SD}=3A,V_{GS}=0V	-	-	1.2	V
Reverse Recovery Time	Trr	I_{SD}=3A,di/dt=100A/μS	-	400	-	ns
Reverse Recovery Charge	Qrr	I_{SD}=3A,di/dt=100A/μS	-	1.6	-	μC

Thermal data

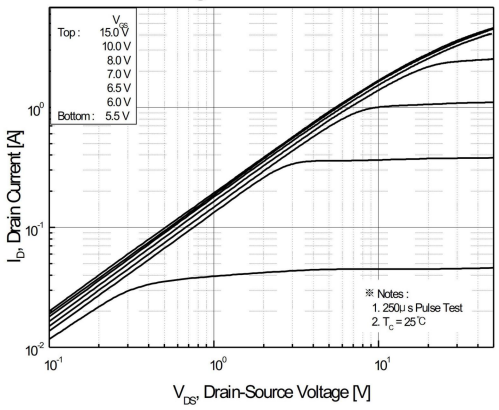
Parameter	Symbol	Value	Unit
Thermal resistance junction max(TO-247)	Rthj-case	0.46	℃/W
Thermal resistance junction max(TO-252/TO-251)	Rthj-case	2.5	℃/W
Thermal resistance junction max(TO-220F)	Rthj-case	1.69	℃/W
Thermal resistance junction max(TO-220)	Rthj-case	4.2	℃/W

Order codes

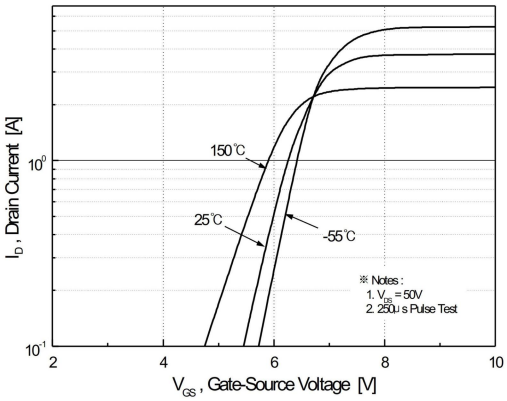
Partnumber	Marking	Package
MS3N100HGC0	MS3N100HGC0	TO-247
MS3N100HGD0	MS3N100HGD0	TO-252
MS3N100HGT1	MS3N100HGT1	TO-220F
MS3N100HGD1	MS3N100HGD1	TO-251
MS3N100HGT0	MS3N100HGT0	TO-220

Electrical characteristics (curves)

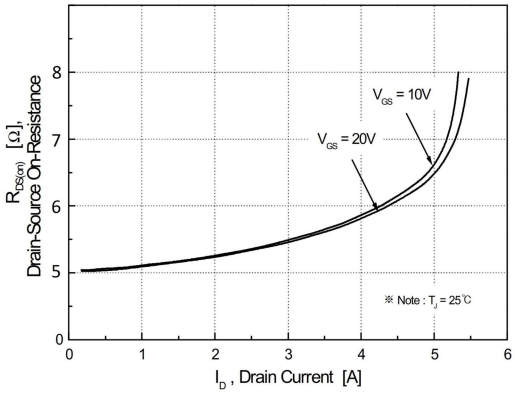
On-Region Characteristics



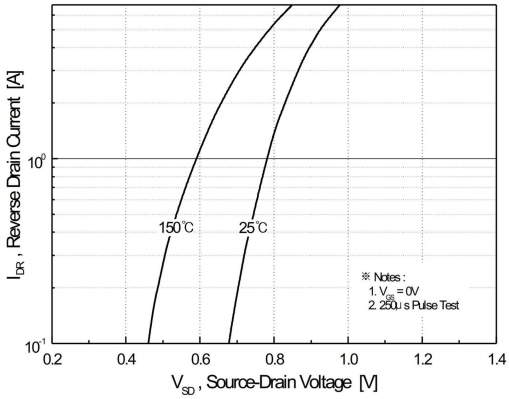
Transfer Characteristics



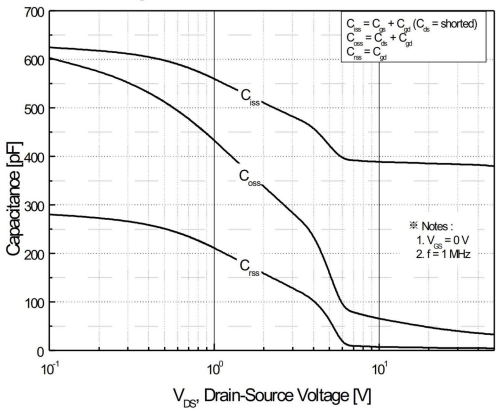
On-Resistance Variation vs. Drain Current and Gate Voltage



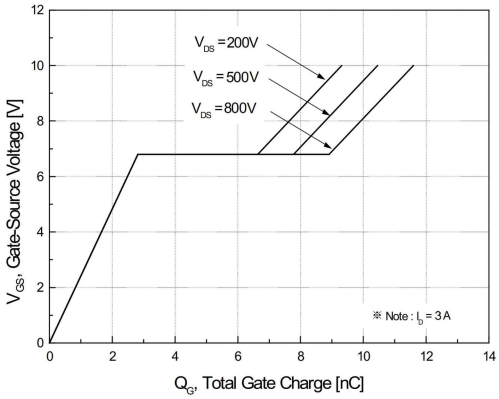
Body Diode Forward Voltage Variation vs. Source Current and Temperature



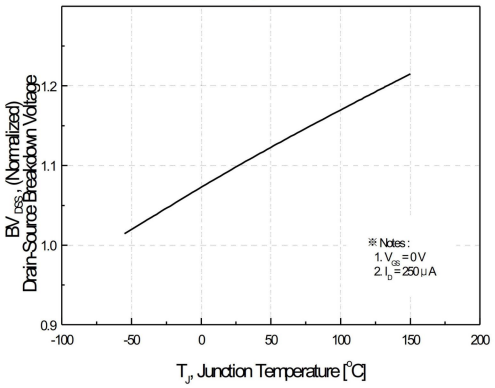
Capacitance Characteristics



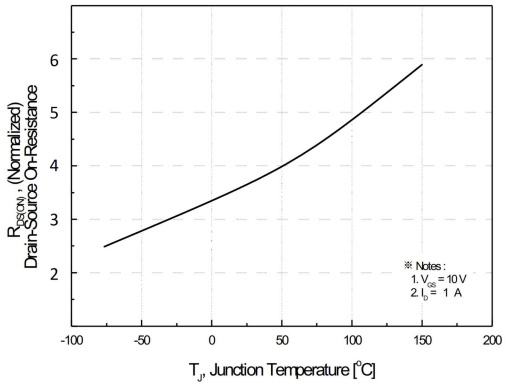
Gate Charge Characteristics



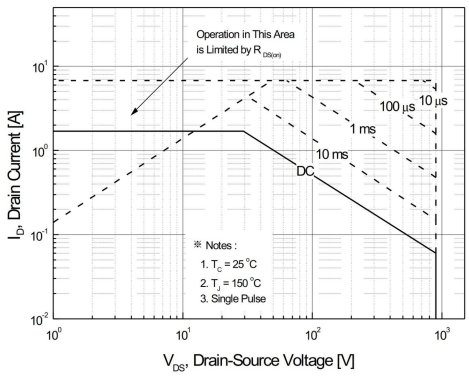
Breakdown Voltage Variation vs. Temperature



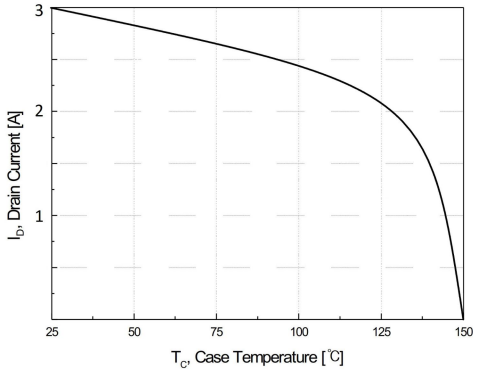
On-Resistance Variation vs. Temperature



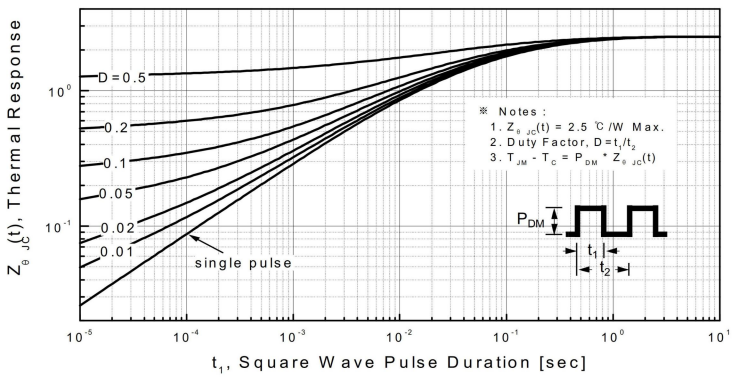
Maximum Safe Operating Area



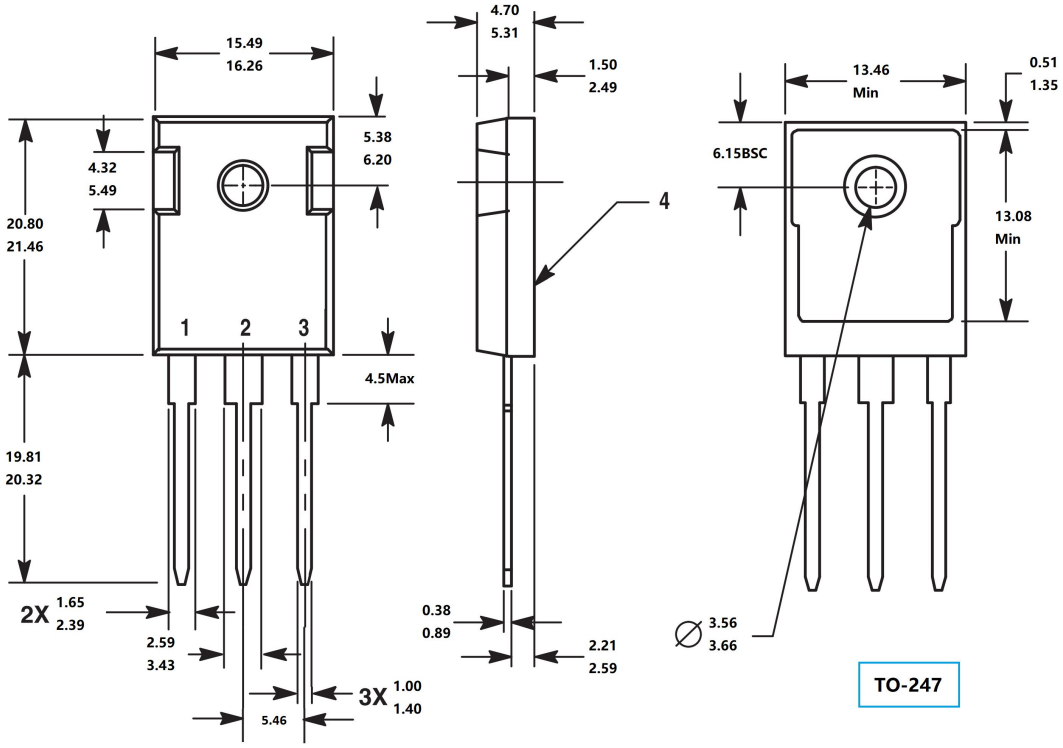
Maximum Drain Current vs. Case Temperature

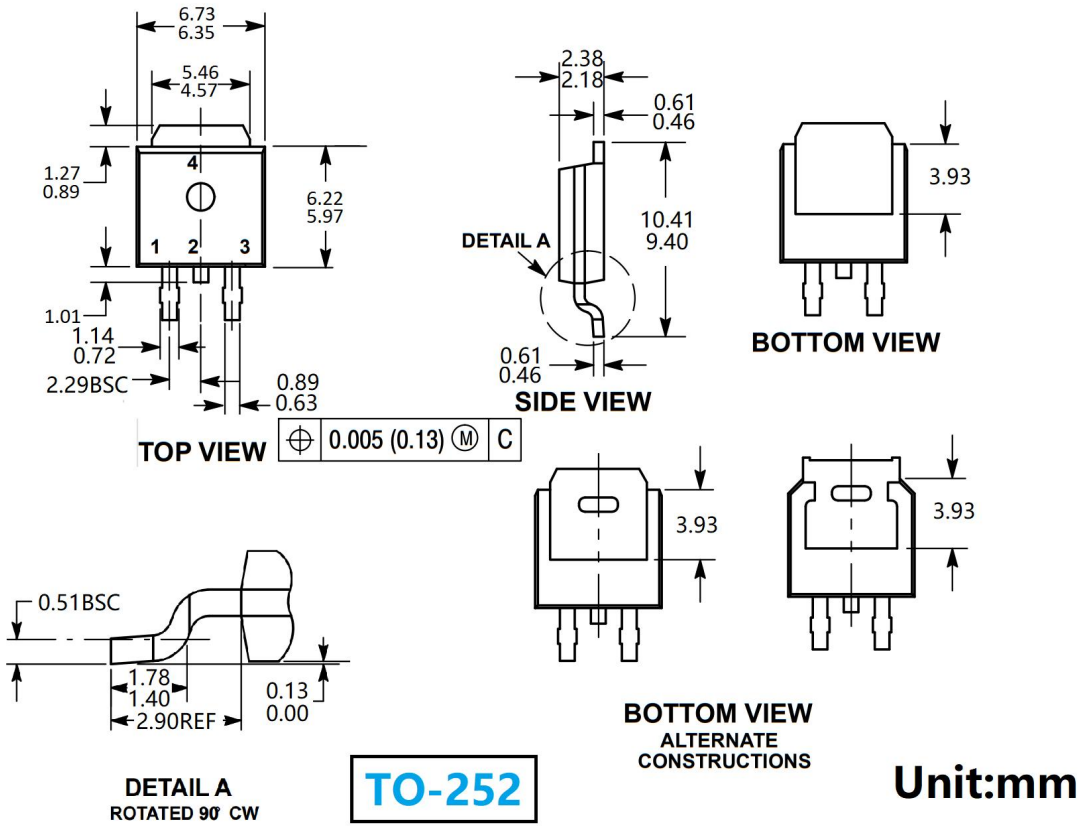


Transient Thermal Response Curve



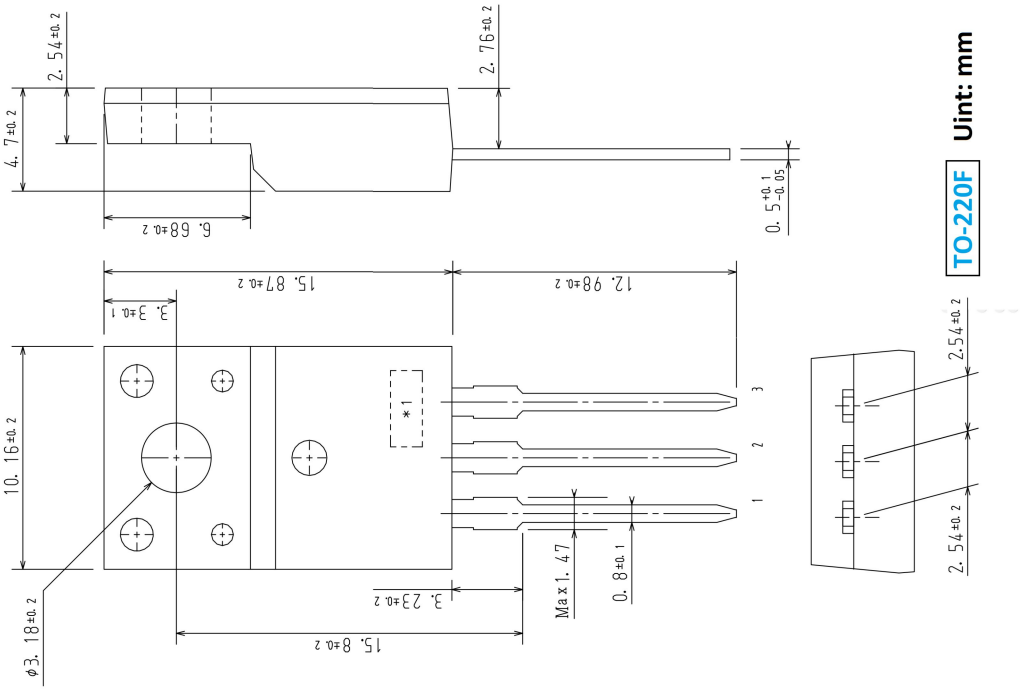
Package outline dimension



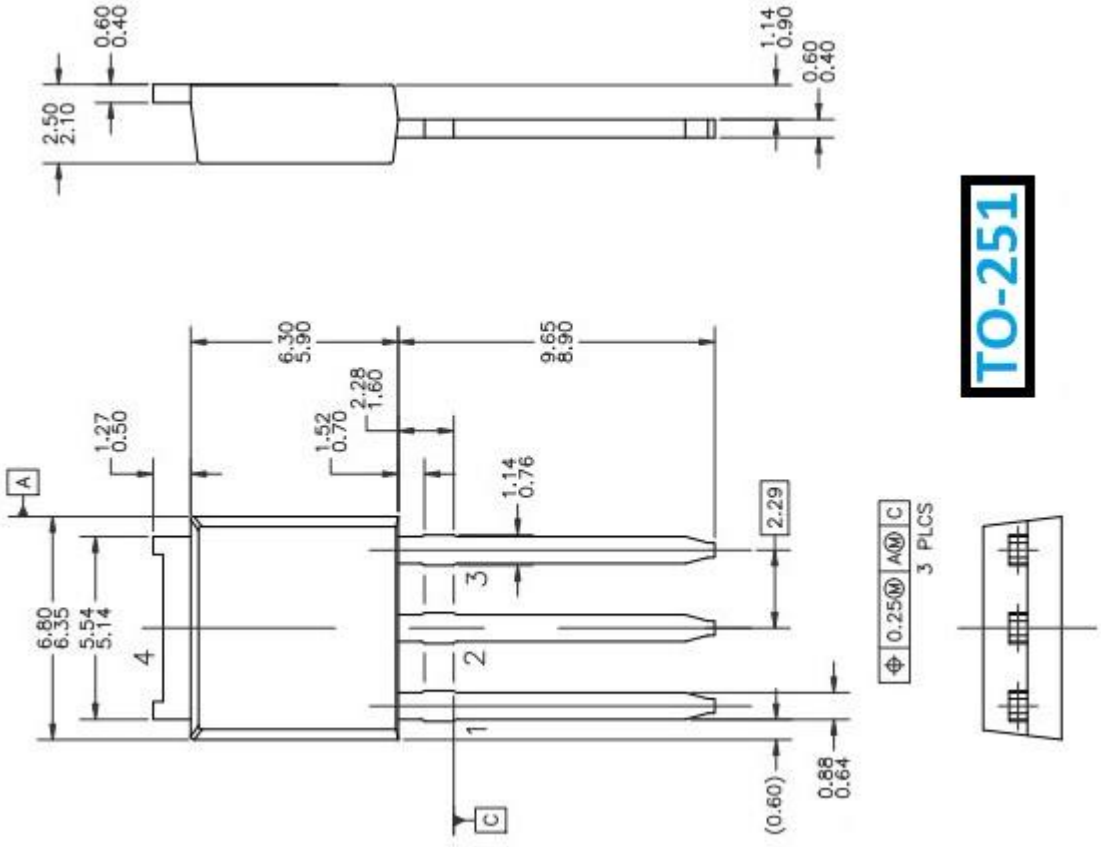


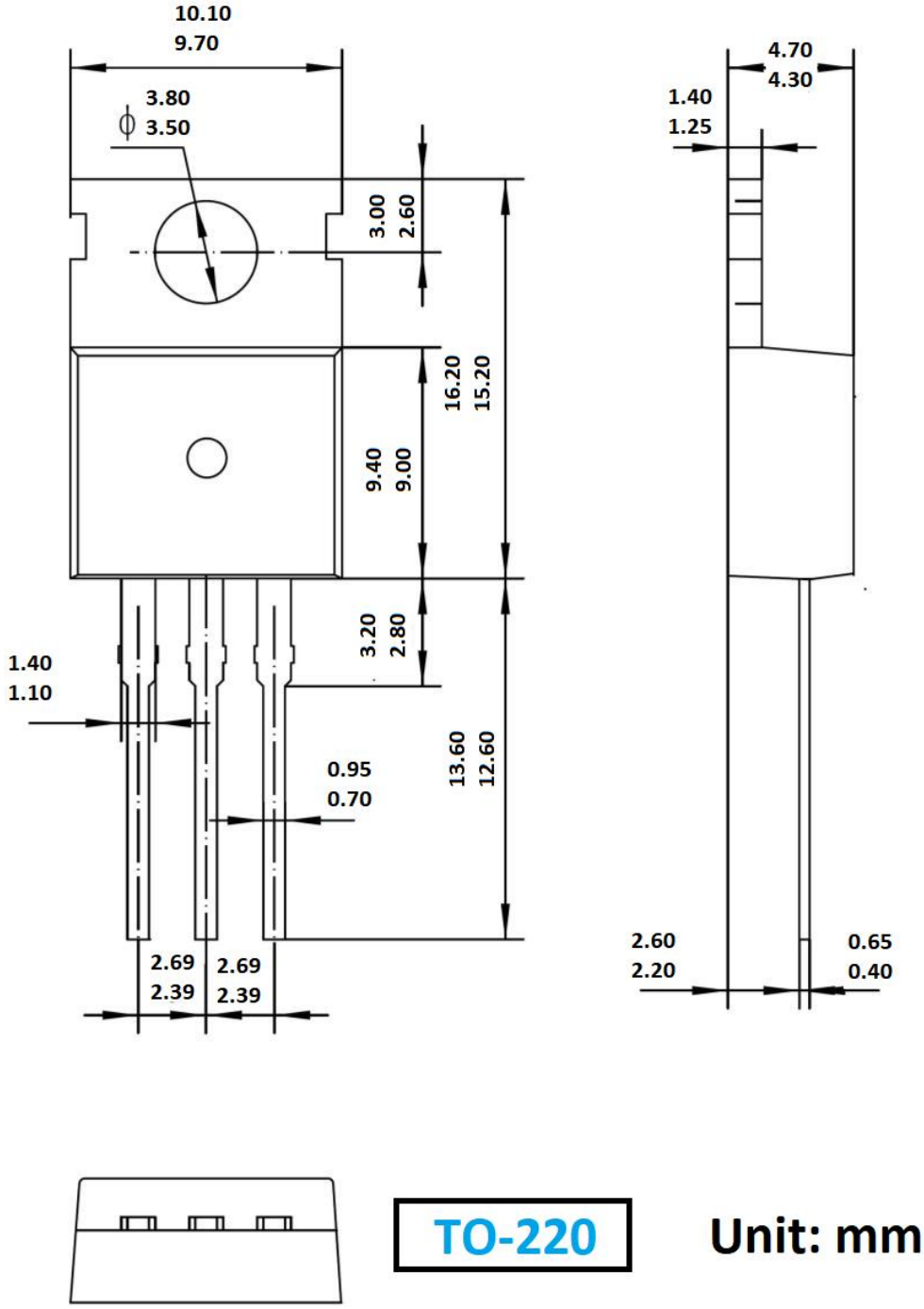
Uint: mm

TO-220F



TO-251





TO-220

Unit: mm

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