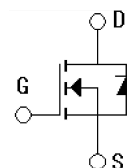
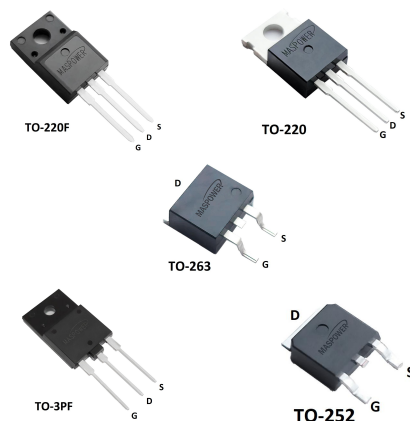


Features

- Low gate charge
- Low C_{rss} (typ 15pF)
- 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 ($T_c=25^\circ\text{C}$)

Parameter	Symbol		Value	Unit
Drain-Source Voltage	V _{DSS}		1000	V
Transient Gate- Source Voltage	V _{GSM}		± 30	
Continuous Gate- Source Voltage(DC)	V _{GSS}		± 20	
Drain Current-continuous	I _D	T _C =25℃	6	A
		T _C =100℃	3.8	A
Drain Current-pulse (note 1)	I _{DM}		18*	A
Single pulse avalanche energy(note 2)	E _{AS}		160	mJ
Avalanche Current （note 1）	I _{AR}		6	A
Repetitive Avalanche Energy(note 1)	E _{AR}		2	mJ
Peak Diode Recovery	dv/dt		4	V/ns
Power Dissipation (TO-220F)	PD		29	W
Power Dissipation (TO-252)			83	W
Power Dissipation (TO-220/TO-263)			198	W
Power Dissipation (TO-3PF)			73	W

Operating and Storage Temperature Range	T_J, T_{STG}	-55~+150	°C
Maximum Lead Temperature for Soldering Purposes	T_L	300	°C

*Drain current limited by maximum junction temperature

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

Parameter	Symbol	Tests conditions	Min	Type	Max	Units
Drain-Source Voltage	BV_{DSS}	$I_D=250\mu\text{A}, V_{GS}=0\text{V}$	1000	-	-	V
Breakdown Voltage Temperature Coefficient	$\Delta BV_{DSS}/\Delta T_J$	$I_D=250\mu\text{A}$, referenced to 25°C	-	0.9	-	V/°C
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=1000\text{V}, V_{GS}=0\text{V}$	-	-	1	μA
		$V_{DS}=800\text{V}, T_C=125^{\circ}\text{C}$	-	-	10	μA
Gate body leakage current	I_{GSS}	$V_{DS}=0\text{V}, V_{GS}=\pm 30\text{V}$	-	-	± 100	nA
On-Characteristics						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu\text{A}$	2.0	-	4.0	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10\text{V}, I_D=2\text{A}, T_C=25^{\circ}\text{C}$	-	2.6	3.3	Ω
Forward Transconductance	g_{FS}	$V_{DS}=40\text{V}, I_D=4\text{A}$ (note 4)	-	7.7	-	S
Dynamic Characteristics						
Input capacitance	C_{iss}	$V_{DS}=25\text{V}, V_{GS}=0\text{V}, f=1.0\text{MHz}$	-	651	-	pF
Output capacitance	C_{oss}		-	77	-	pF
Reverse transfer capacitance	C_{rss}		-	15	-	pF

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

Parameter	Symbol	Tests conditions	Min	Type	Max	Units
Switching-Characteristics						
Turn-On delay time	$t_{d(on)}$	$V_{DD}=450\text{V}, I_D=4\text{A}, R_{GEN}=25\Omega$ (note 4,5)	-	12.6	-	ns
Turn-On rise time	t_r		-	25	-	ns
Turn-Off delay time	$t_{d(off)}$		-	46.2	-	ns

Turn-Off rise time	t _f		-	31	-	ns
Total Gate Charge	Q _g	V _{DS} =720V,I _D =4A, V _{GS} =10V (note 4,5)	-	14.7	-	nC
Gate-Source charge	Q _{gs}		-	4	-	nC
Gate-Drain charge	Q _{gd}		-	4.53	-	nC
Drain-Source Diode Characteristics and Maximum Ratings						
Diode Forward Voltage (note 3)	V _{SD}	V _{GS} =0V,I _S =6A	-	-	1.4	V
Maximum Pulsed Drain-Source Diode Forward Current	I _{SM}	-	-	-	18	A
Maximum Continuous Drain Source Diode Forward Current	I _S	-	-	-	6	A
Reverse recovery time	t _{rr}	V _{GS} =0V, I _S =4A	-	467	-	ns
Reverse recovery charge	Q _{rr}	dI _F /dt=100A/μs (note 4)	-	2235	-	μC

Thermal Characteristic

Parameter	Symbol	Value				Unit
		TO-220F	TO-220/ TO-263	TO-252	TO-3PF	
Thermal Resistance, junction to Case,max	$R_{th(j-C)}$	4.2	0.63	1.5	1.69	$^{\circ}C/W$
Thermal Resistance, Junction to Ambient,max	$R_{th(j-A)}$	47.4	48	35	58	$^{\circ}C/W$

Order Codes

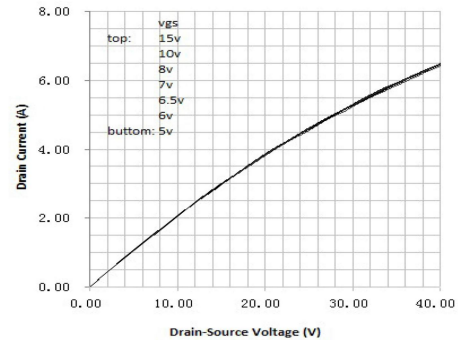
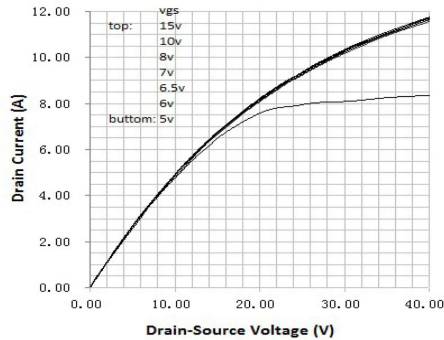
Part number	Marking	Package
MS6N100FS	MS6N100FS	TO-220F
MS6N100FT	MS6N100FT	TO-220
MS6N100FE	MS6N100FE	TO-263
MS6N100FA	MS6N100FA	TO-3PF
MS6N100FD	MS6N100FD	TO-252

Notes:

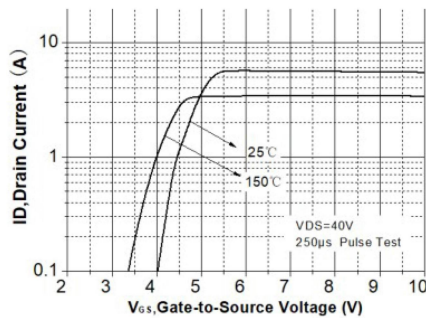
1. Pulse width limited by maximum junction temperature
2. $L=10mH, I_{AS}=6A, V_{DD}=100V, R_G=25 \Omega$, Starting $T_J=25^{\circ}C$
3. $I_{SD} \leq 6A, di/dt \leq 100A/\mu s, V_{DD} \leq BV_{DSS}$, Starting $T_J=25^{\circ}C$
4. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$
5. Essentially independent of operating temperature

ELECTRICAL CHARACTERISTICS (curves)

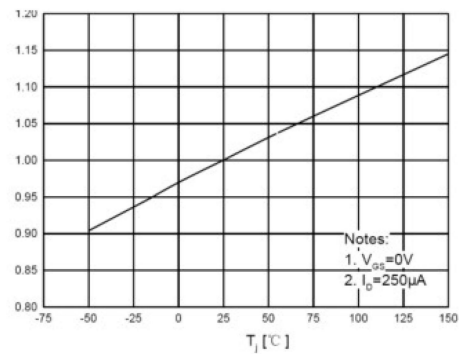
On-Region Characteristics($T_j=25^\circ\text{C}$) On-Region Characteristics($T_j=150^\circ\text{C}$)



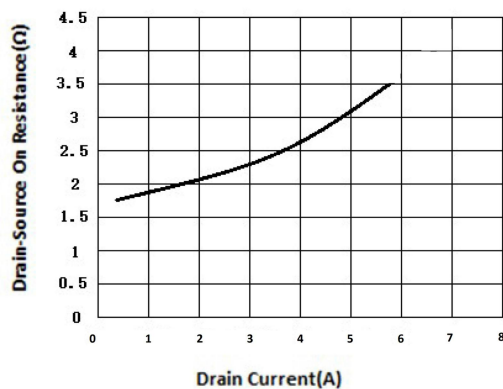
Transfer Characteristics



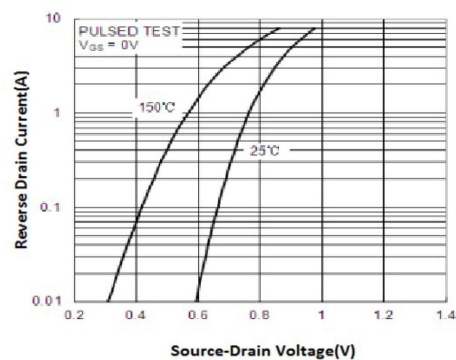
Breakdown Voltage Variation vs. Temperature



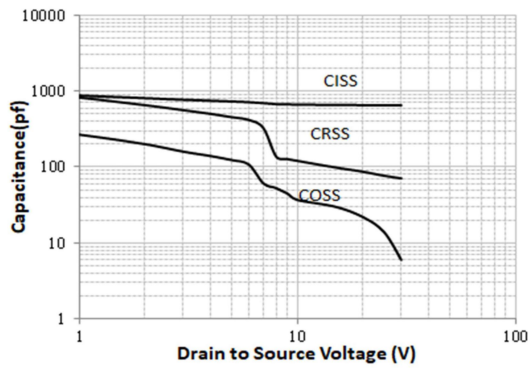
On-Resistance Variation vs. Drain Current and Gate Voltage



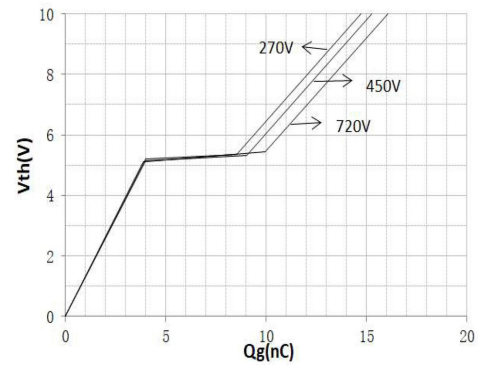
Body Diode Forward Voltage Variation vs. Source current and Temperature



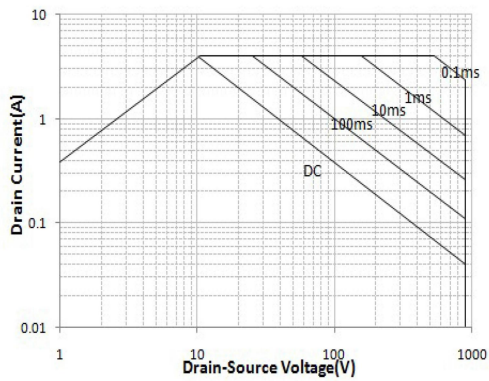
Capacitance Characteristics



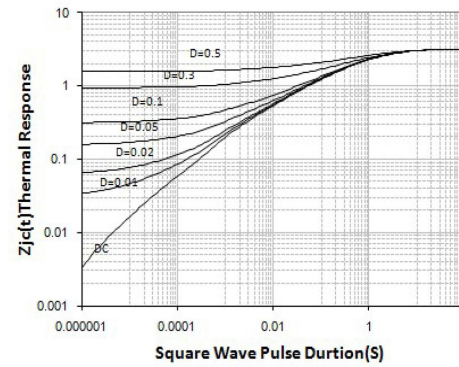
Gate Charge Characteristics



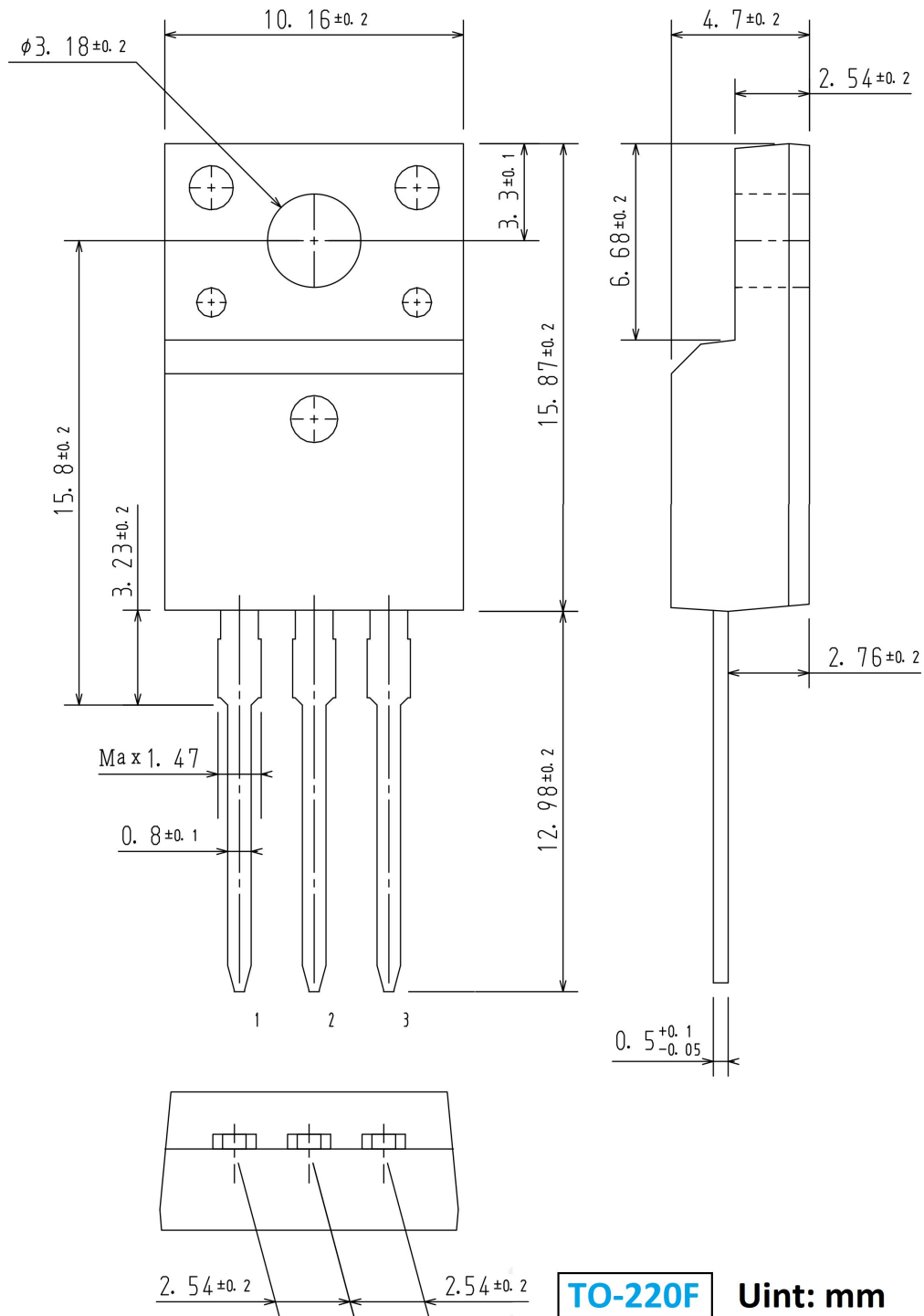
Maximum safe operating area

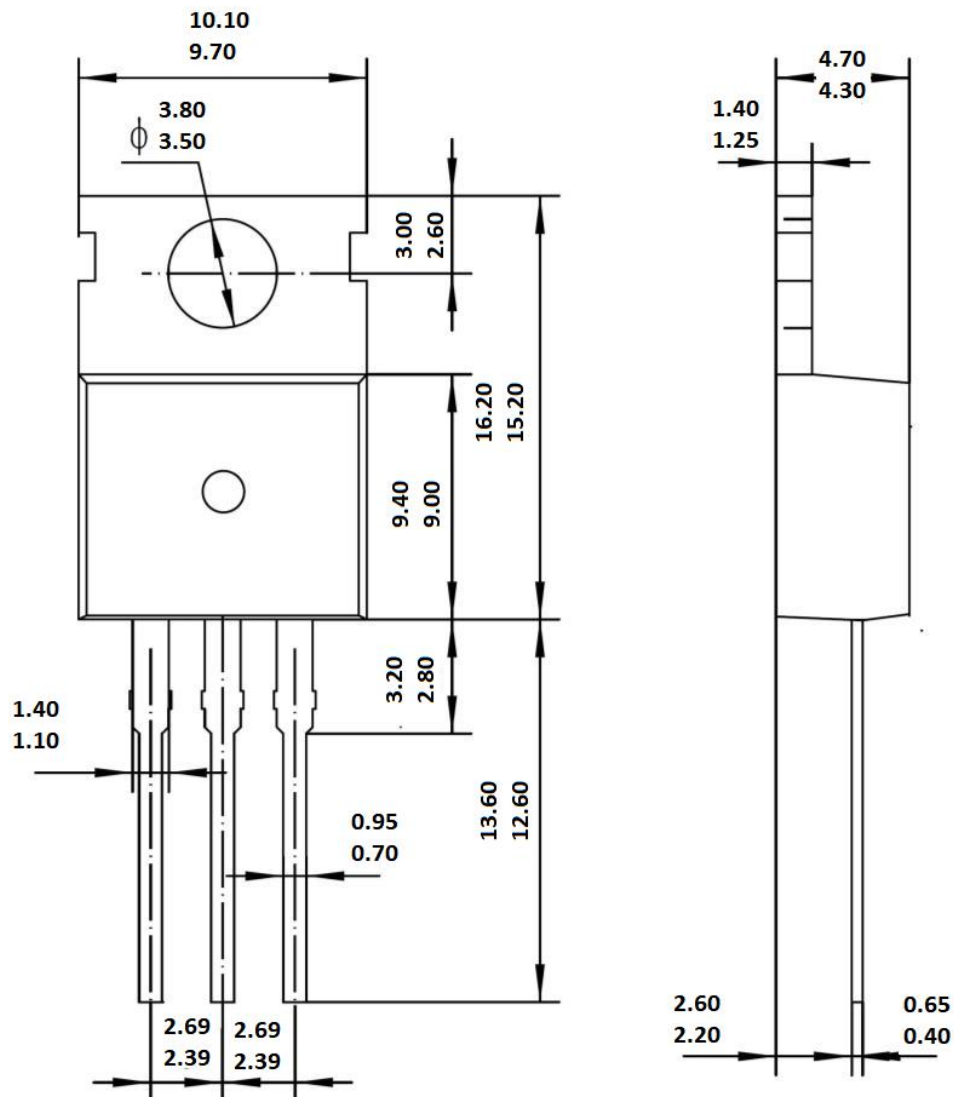


Transient Thermal Response Curve



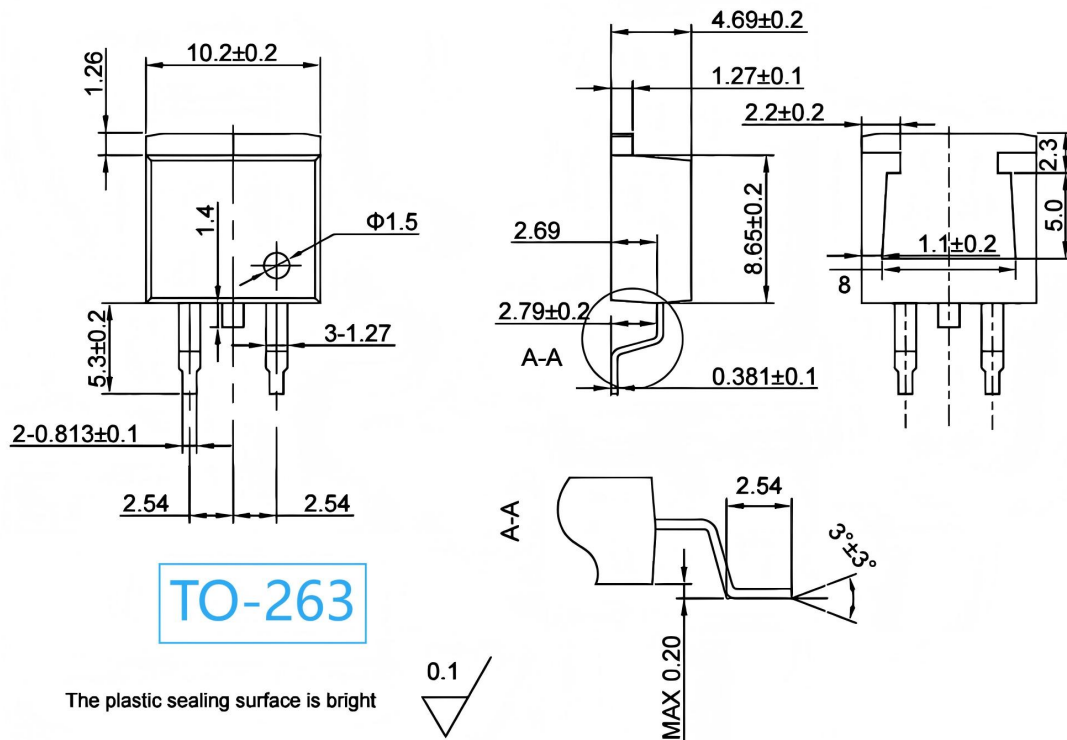
PACKAGE MECHANICAL DATA





TO-220

Unit: mm



Notes:

1. Unmarked tolerance ± 0.15 mm; unmarked $R < 0.15$ mm
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

