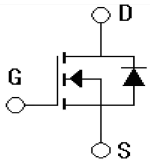
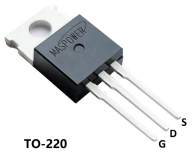
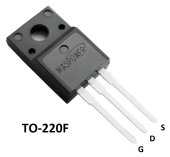
Features

- Low Crss (typical 22pF)
- Low gate charge
- 100% avalanche tested
- Improved dv/dt capability
- RoHS product







Applications

- UPS
- High efficiency switch mode power supplies
- Electronic lamp ballasts based on half bridge

Absolute Ratings (Tc=25℃)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DSS}	400	V
Gate-Source Voltage	V_{GSS}	±30	V
Drain Current-continuous	I_D	10	A
Drain Current-pulse	I_{DM}	30	A
Single Pulsed Avalanche Energy	E_{AS}	450	mJ
Maximum Power Dissipation(TO-220/TO-252)	PD	134	W
Maximum Power Dissipation(TO-220F)	PD	68	
Operating and Storage Temperature Range	T_J,T_{STG}	-55~+150	℃

*Drain current limited by maximum junction temperature

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

Parameter	Symbol	Tests conditions	Min	Typ	Max	Units
Drain-Source Voltage	BV_{DSS}	I_D=0.25mA,V_{GS}=0V	400	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=V_{DSS},V_{GS}=0V	-	-	10	μA
Gate-Body Leakage Current	I_{GSS}	V_{GS}=±30V，V_{DS}=0V	-	-	±100	nA

On-Characteristics						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=0.25mA	2.0	-	4.0	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=10V,I_D=5A	-	0.43	0.54	Ω
Forward Transconductance	g_{fs}	V_{DS}=40V,I_D=5A	-	9.6	-	S
Dynamic Characteristics						
Input capacitance	C_{iss}	V_{DS}=25V, V_{GS}=0V, f=1.0MHZ	-	650	809	pF
Output capacitance	C_{oss}		-	70	95	pF
Reverse transfer capacitance	C_{rss}		-	25	33	pF

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

Parameter	Symbol	Tests conditions	Min	Typ	Max	Units
Switching-Characteristics						
Turn-On delay time	$t_{d(on)}$	V_{DS}=200V,I_D=10A, R_G=25Ω	-	20	50	ns
Turn-On rise time	t_r		-	80	170	ns
Turn-Off delay time	$t_{d(Off)}$		-	125	260	ns
Turn-Off rise time	t_f		-	85	180	ns
Total Gate Charge	Q_g	V_{DS}=320V,I_D=10A, V_{GS}=10V	-	19.7	25.6	nC
Gate-Source charge	Q_{gs}		-	7.38	-	nC
Gate-Drain charge	Q_{gd}		-	4.66	-	nC
Drain-Source Diode Characteristics and Maximum Ratings						
Maximum Continuous Drain-Source Diode Forward Curret	V_{SD}	V_{GS}=0V,I_S=10A	-	1.5	-	V
Diode Forward Current	I_S	TC=25℃	-	-	10	A
Reverse recovery time	Trr	I_S=10A, dI/dT=100A/μS	-	-	217	nS
Reverse recovery charge	Qrr		-	2.45	-	μC

Thermal Characteristic

Parameter	Symbol	Value		Unit
		TO-220/ TO-252	TO-220F	
Thermal Resistance,junction to Case	R_{th}(j-C)	0.93	1.83	℃/W
Thermal Resistance,junction to Ambient	R_{th}(j-A)	62.5		℃/W

Notes:

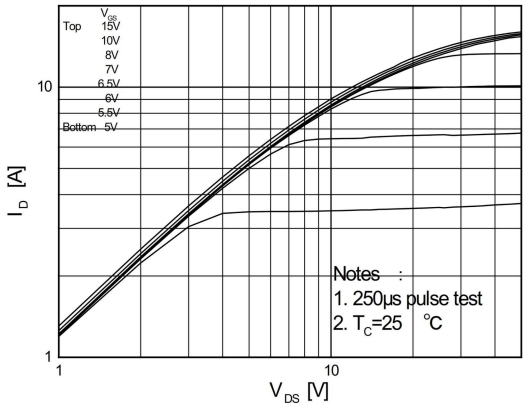
1. Pulse width limited by maximum junction temperature
2. L=7.9mH, IAS=10A, VDD=50V, RG=25 Ω,Starting TJ=25℃
3. ISD ≤10A,di/dt ≤300A/μs,VDD≤BVDSS, Starting TJ=25℃
4. Pulse Test：Pulse Width ≤300μs,Duty Cycle≤2%
5. Essentially independent of operating temperature

Order information

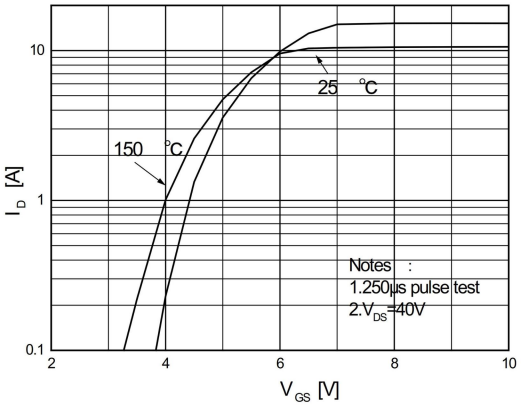
Order codes	Package	Packaging
MS10N40HGT0	TO-220	Tube
MS10N40HGT1	TO-220F	Tube
MS10N40HGD0	TO-252	Reel

Electrical Characteristics

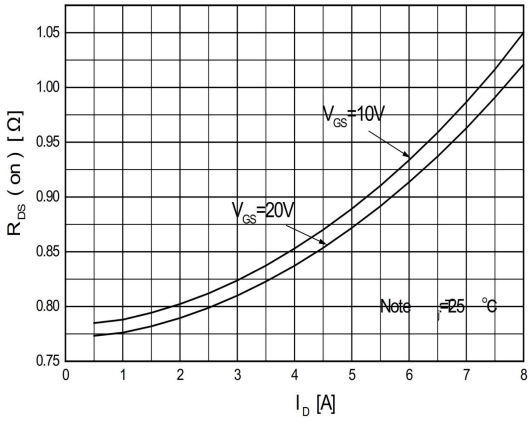
On-Region Characteristics



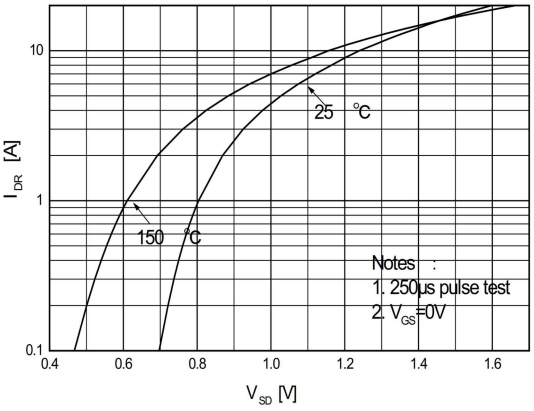
Transfer Characteristics



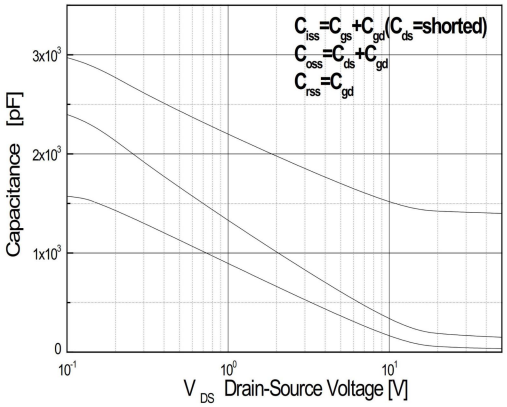
On-Resistance Variation vs. Drain Current and Gate Voltage



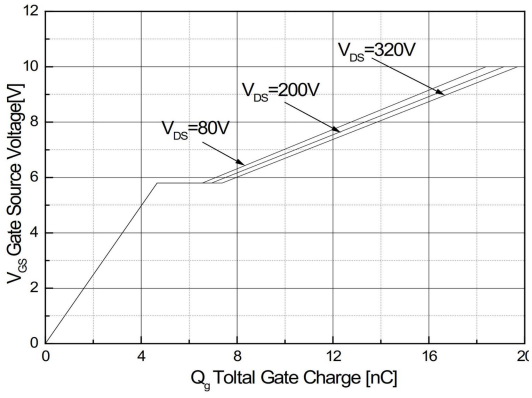
Body Diode Forward Voltage Variation vs.Source Current and Temperature



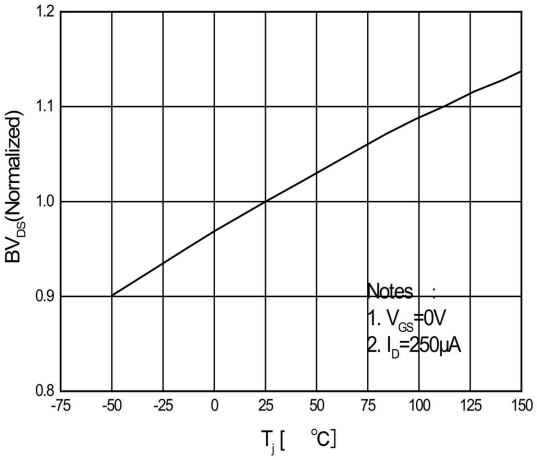
Capacitance Characteristics



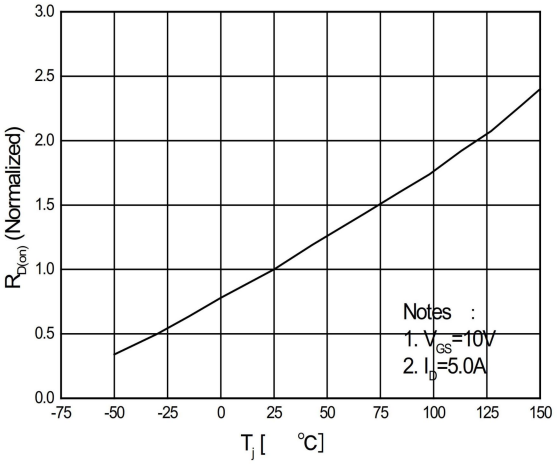
Gate Charge Characteristics



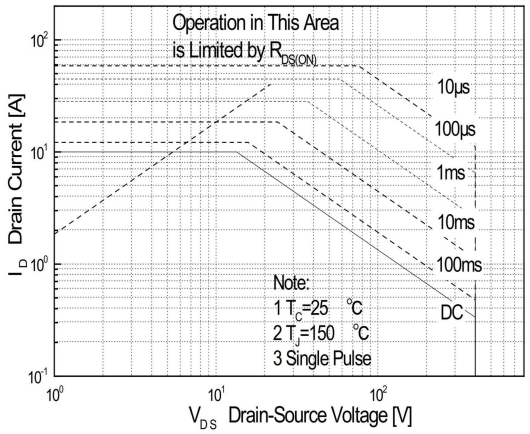
Breakdown Voltage Variation vs. Temperature



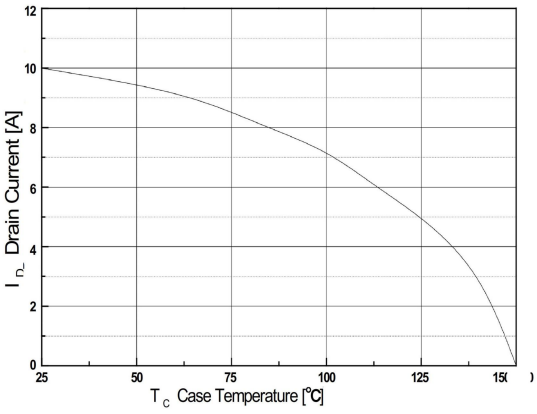
On-Resistance Variation vs.Temperature



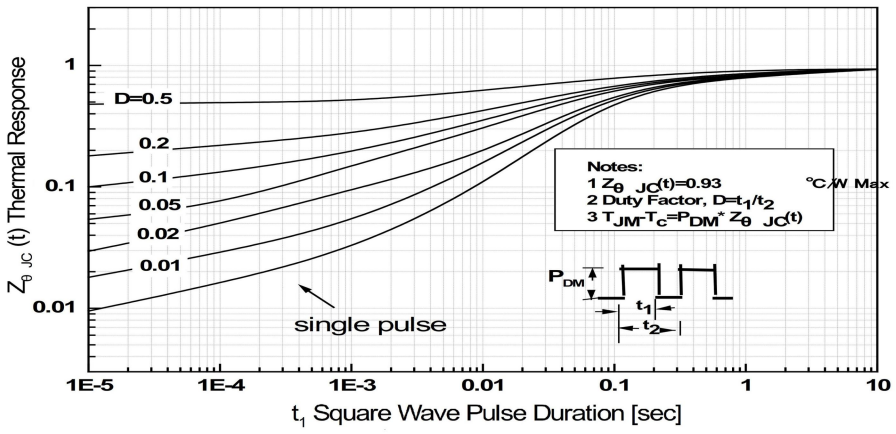
Maximum Safe Operating Area



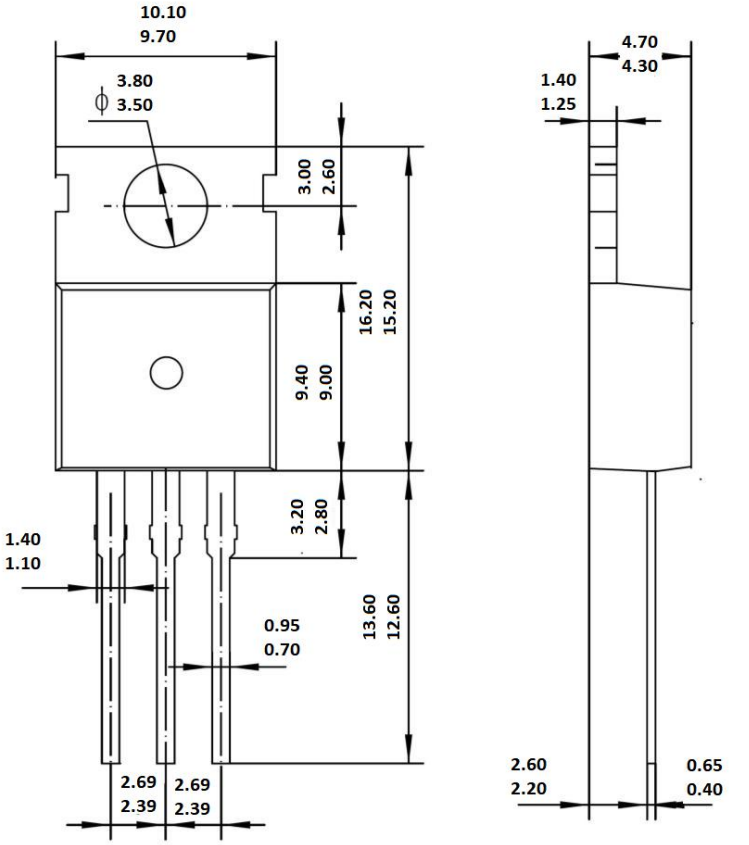
Maximum Drain Current vs. Case Temperature

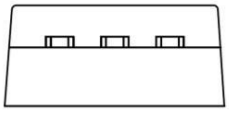


Transient Thermal Response Curve



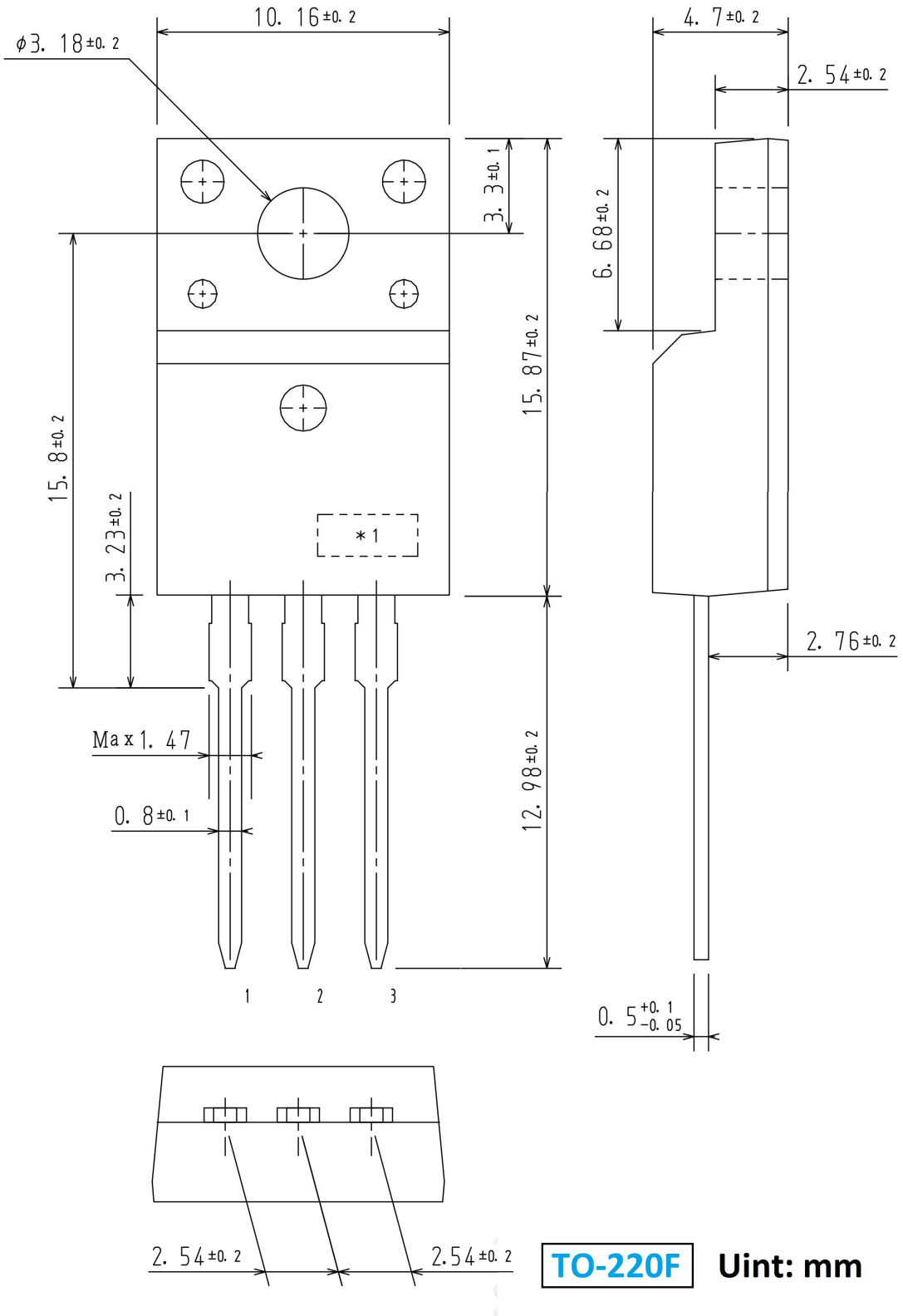
Package Mechanical DATA



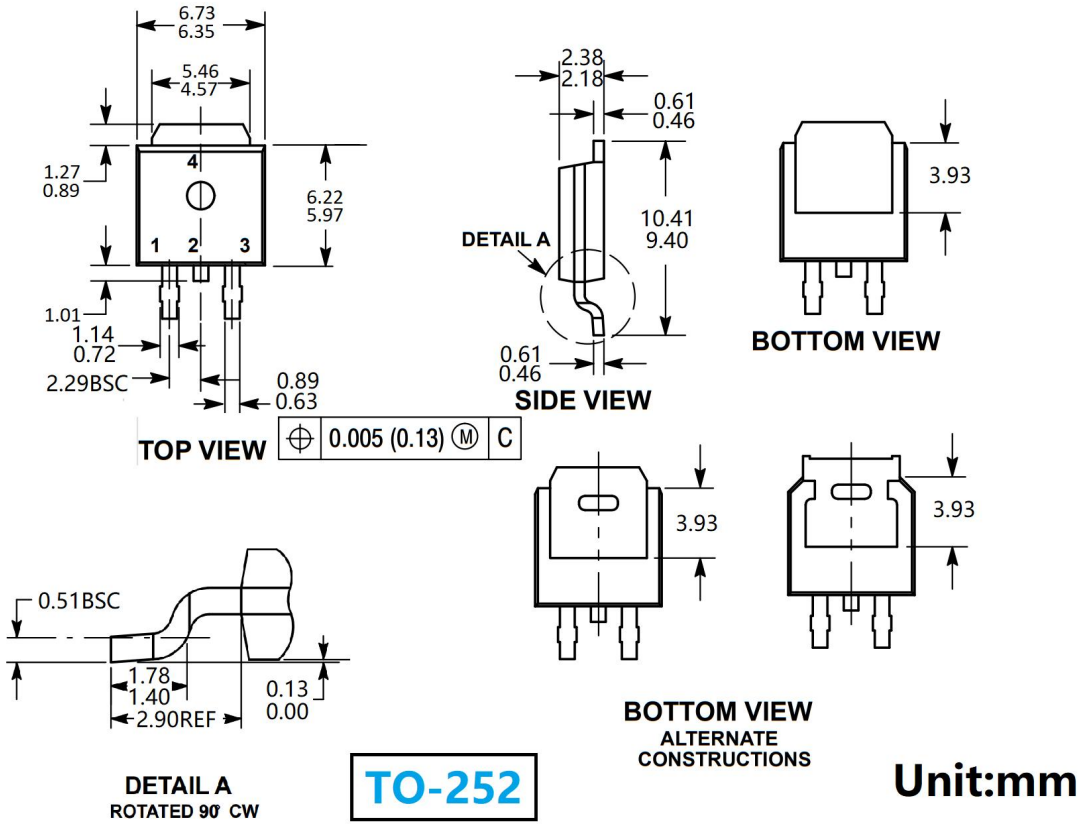


TO-220

Unit: mm



TO-220F **Uint: mm**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5.46
4.57
1.27
0.89
6.22
5.97
4
1 2 3
1.01
1.14
0.72
2.29BSC
0.89
0.63
TOP VIEW
0.005 (0.13) M C
2.38
2.18
0.61
0.46
DETAIL A
10.41
9.40
0.61
0.46
SIDE VIEW
3.93
BOTTOM VIEW
3.93
3.93
0.51BSC
1.78
1.40
2.90REF
0.13
0.00
DETAIL A
ROTATED 90° CW
BOTTOM VIEW
ALTERNATE
CONSTRUCTIONS
TO-252
Unit:mm