

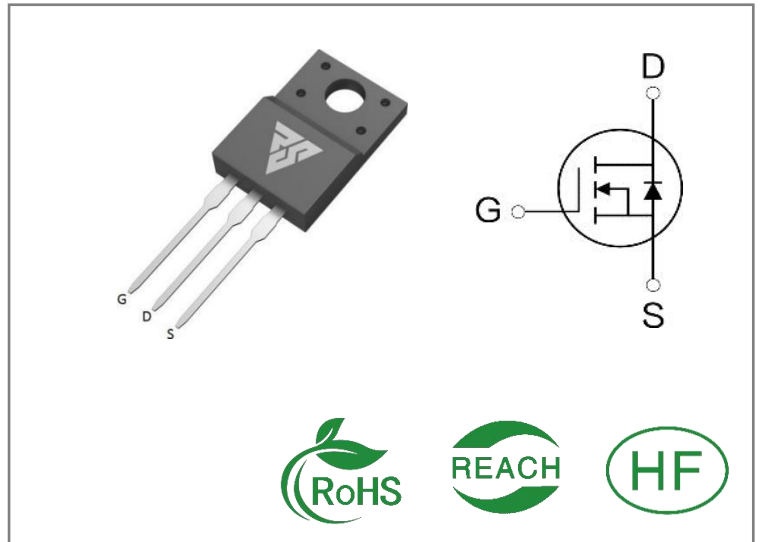
ID	$R_{DS(ON)}$ (Typ)	VDSS
20A	165mΩ	600V

Applications:

- Switch Mode Power Supply(SMPS)
- Uninterruptible Power Supply (UPS)
- Power Factor Correction (PFC)
- AC-DC Switching Power Supply

Features:

- Fast switching speed
- 100% avalanche tested
- Improved dv/dt capability
- Fast Recovery Time


Ordering Information

Part Number	Package	Marking	Packing	Qty.
RSF60R190F	T0-220F	RSF60R190F	Tube	50 PCS

Absolute Maximum Ratings $T_c = 25^\circ\text{C}$ unless otherwise specified

Symbol	Parameter	RSF60R190F	Units
VDSS	Drain-to-Source Voltage	600	V
ID	Continuous Drain Current $T_C=25^\circ\text{C}$	20	A
ID	Continuous Drain Current $T_C=100^\circ\text{C}$	12	
IDM	Pulsed Drain Current (Note*1)	39	
PD	Power Dissipation	115	W
VGS	Gate- to- Source Voltage	± 30	V
EAS	Single Pulse Avalanche Energy $L=10\text{mH}, V_{DS}=50\text{V}, R_G=25\Omega, T_C=25^\circ\text{C}$	720	mJ
TL TPKG	Maximum Temperature for Soldering	300 260	$^\circ\text{C}$
	Leads at 0.063in(1.6mm)from Case for 10 seconds Package Body for 10 seconds		
TJ and TSTG	Operating Junction and Storage Temperature Range	-55 to 150	

* Drain Current Limited by Maximum Junction Temperature

Caution: Stresses greater than those listed in the "Absolute Maximum Ratings" Table may cause permanent damage to the device.

Thermal Resistance

Symbol	Parameter	RSF60R190F	Units	Test Conditions
R θ JC	Junction-to-Case	1.08	°C / W	Drain lead soldered to water cooled heatsink, PD adjusted for a peak junction temperature of + 150 °C
R θ JA	Junction-to- Ambient	43.5		1 cubic foot chamber, free air.

OFF Characteristics TJ= 25°C unless otherwise specified

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
BVDSS	Drain- to- source Breakdown Voltage	600	--	--	V	VGS=0V, ID=250μA
IDSS	Drain- to- Source Leakage Current	--	--	1	μA	VDS=600V VGS=0V
IGSS	Gate- to- Source Forward Leakage	--	--	100	nA	VGS=30V ,VDS=0V
	Gate- to- Source Reverse Leakage	--	--	-100		VGS=-30V,VDS=0V

ON Characteristics TJ=25°C unless otherwise specified

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
RDS(on)	Static Drain- to- Source On-Resistance(Note*2)	--	165	190	mΩ	VGS=10V, ID=10A
VGS(TH)	Gate Threshold Voltage	3	4	5	V	VGS=VDS ID=250μA

Resistive Switching Characteristics Essentially independent of operating temperature

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
td(ON)	Turn- on Delay Time	--	13	--	nS	VDS=400V ID=10A RG=2.5Ω
trise	Rise Time	--	9	--		
td(OFF)	Turn- OFF Delay Time	--	30	--		
tfall	Fall Time	--	7	--		

Dynamic Characteristics Essentially independent of operating temperature

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
Ciss	Input Capacitance	--	1463	--	pF	VGS=0V VDS=100V f=1MHz
Coss	Output Capacitance	--	47	--		
Crss	Reverse Transfer Capacitance	--	0.43	--		
Qg	Total Gate Charge	--	33	--	nC	VDS=480V ID=10A VGS=10V
Qgs	Gate- to- Source Charge	--	8.6	--		
Qgd	Gate-to-Drain(" Miller") Charge	--	14	--		

Source- Drain Diode Characteristics

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
IS	Continuous Source Current	--	--	20	A	Integral pn- diode in MOSFET
ISM	Maximum Pulsed Current	--	--	48	A	
VSD	Diode Forward Voltage	--	--	1.2	V	IS=20A,VGS=0V
trr	Reverse Recovery Time	--	98	--	nS	VR=300V IS=10A di/dt=100A/μs
Qrr	Reverse Recovery Charge	--	1	--	μC	

Notes:

- * 1. Repetitive rating, pulse width limited by maximum junction temperature.
- * 2. Pulse Test: Pulse width ≤ 300μs, Duty Cycle ≤ 2%

Typical Feature Curve

Figure 1. Typical Output Characteristics

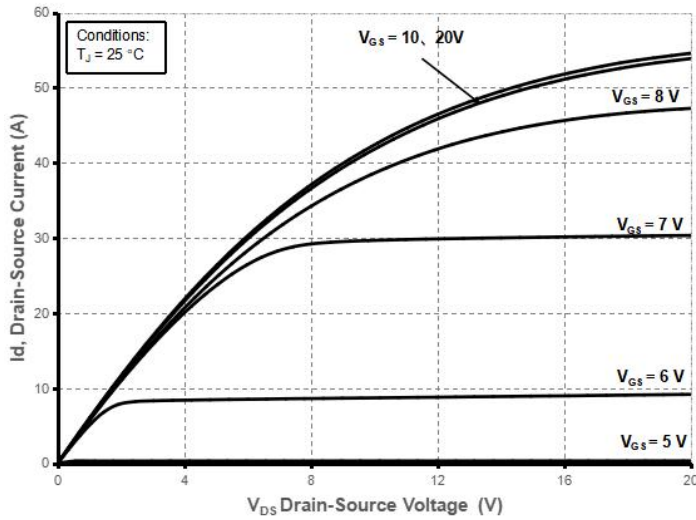


Figure 2. Typical Transfer Characteristics

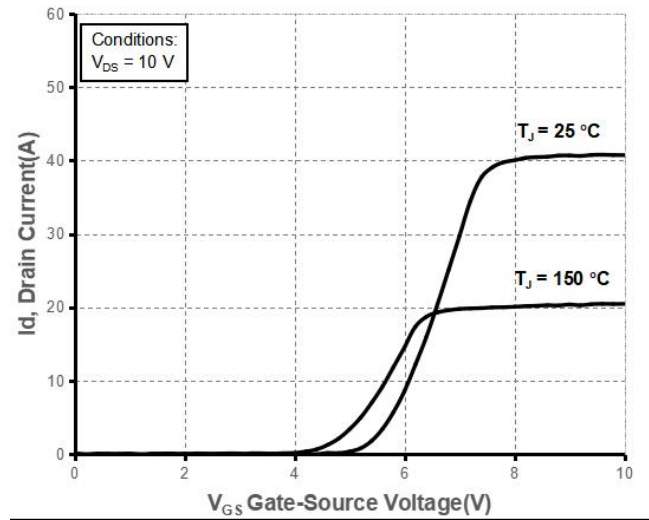


Figure 3. On-Resistance versus Drain Current

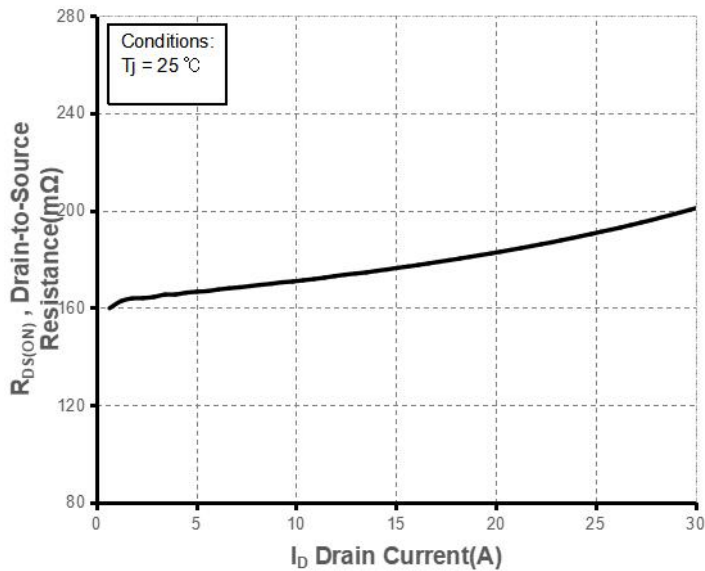


Figure 4. Diode forward voltage versus Current

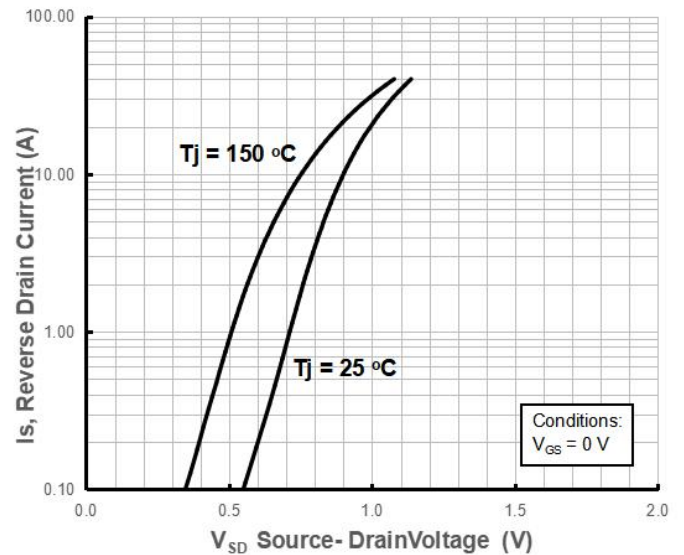


Figure 5. Typical Capacitance versus VDS

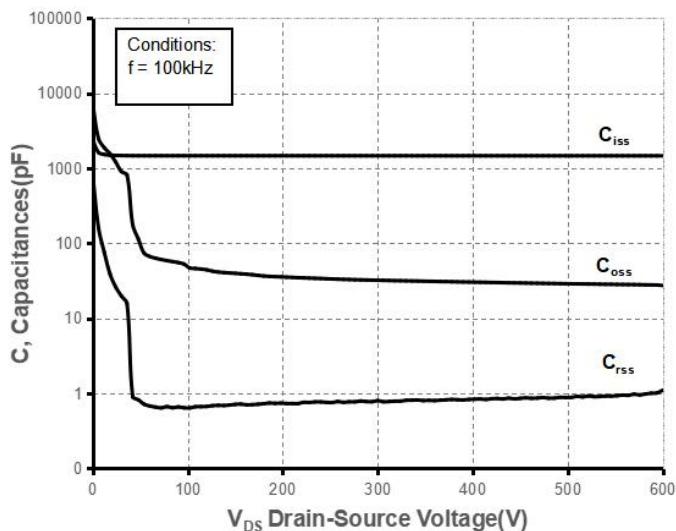


Figure 6. Typical Gate Charge versus VGS

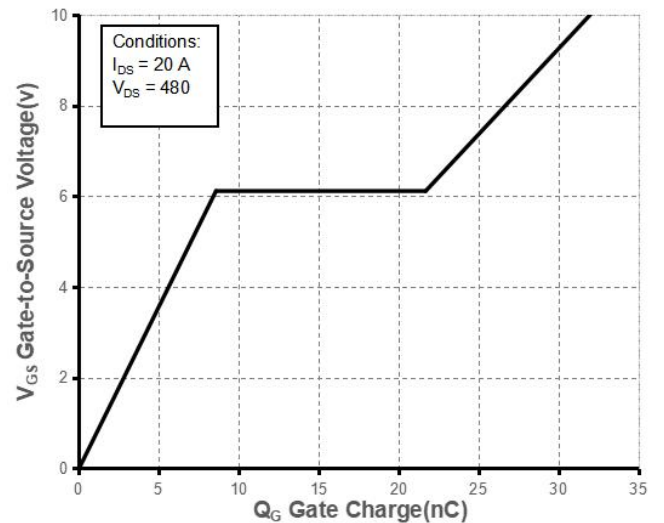


Figure 7. BVDSS Variation with Temperature

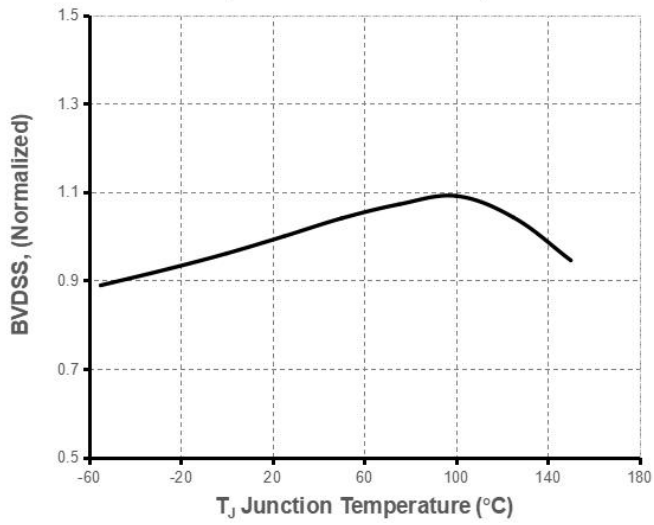


Figure 8. On-Resistance Variation with Temperature

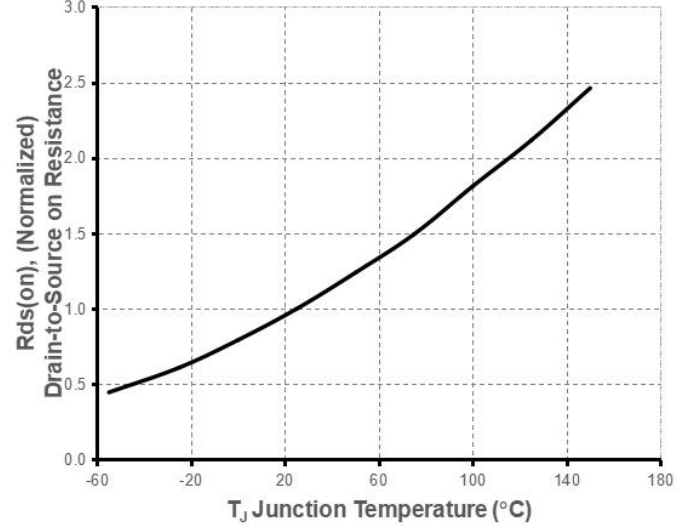


Figure 9. Transient Thermal Impedance

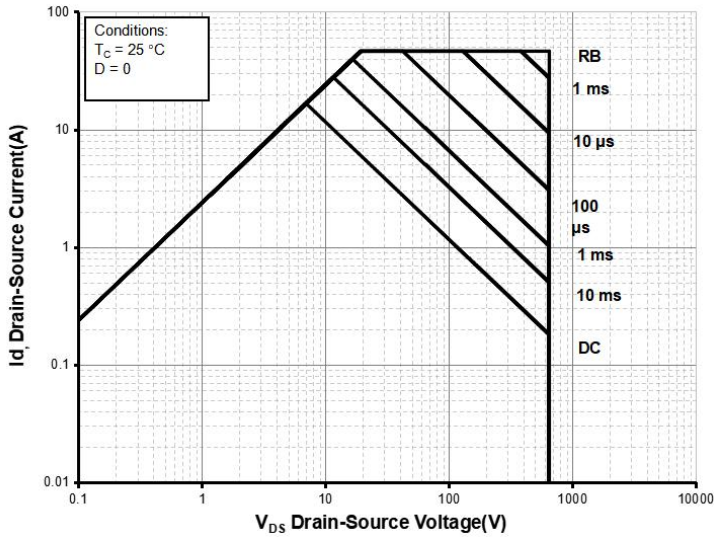
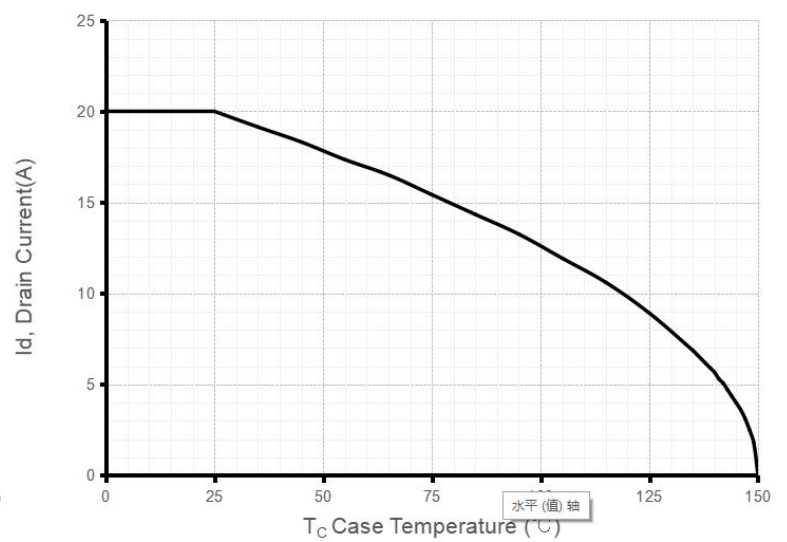


Figure 10. Maximum Continuous Drain versus Case Temperature



Test Circuits and Waveforms

Figure A: Gate Charge Test Circuit and Waveform

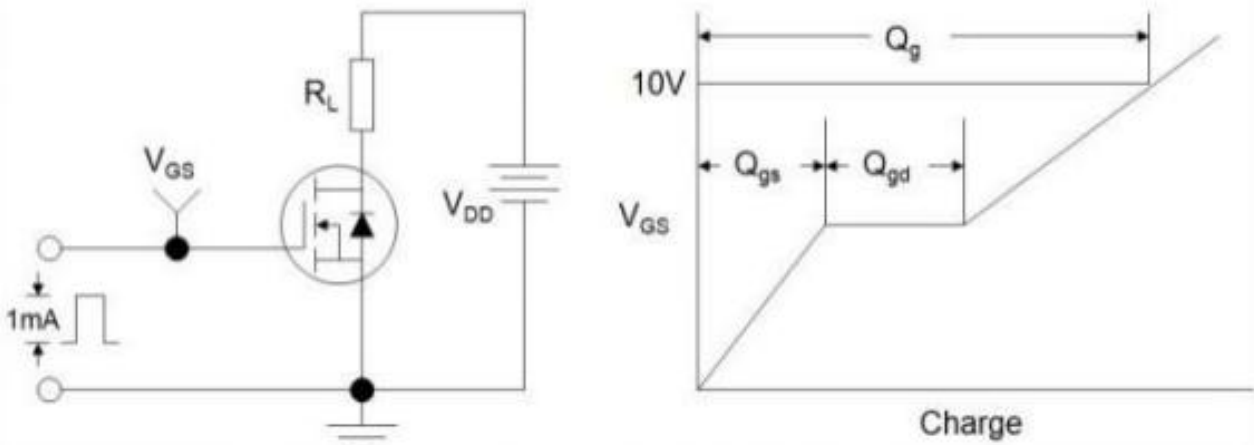


Figure B: Resistive Switching Test Circuit and Waveform

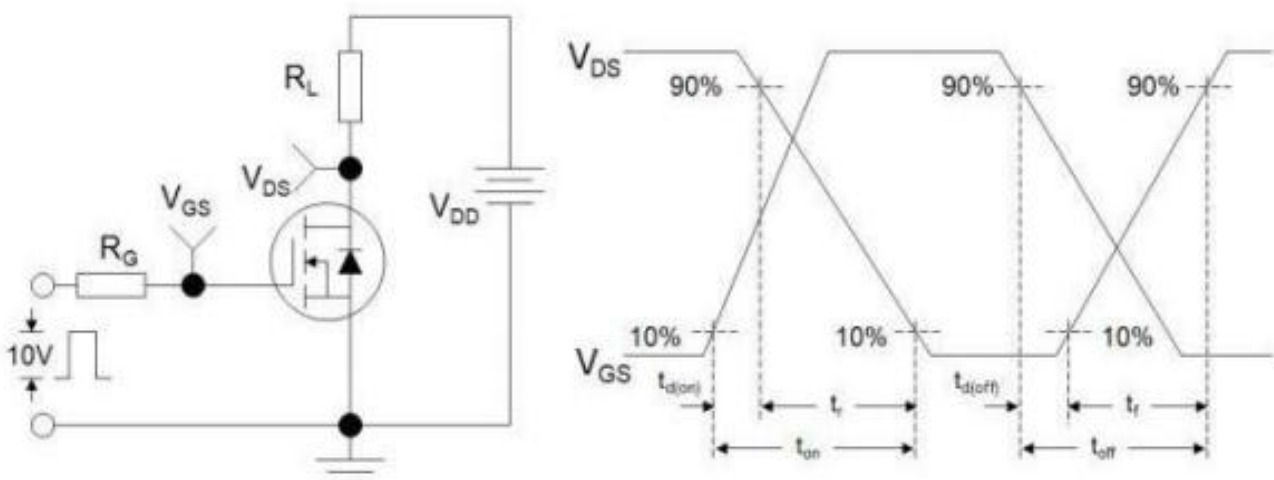
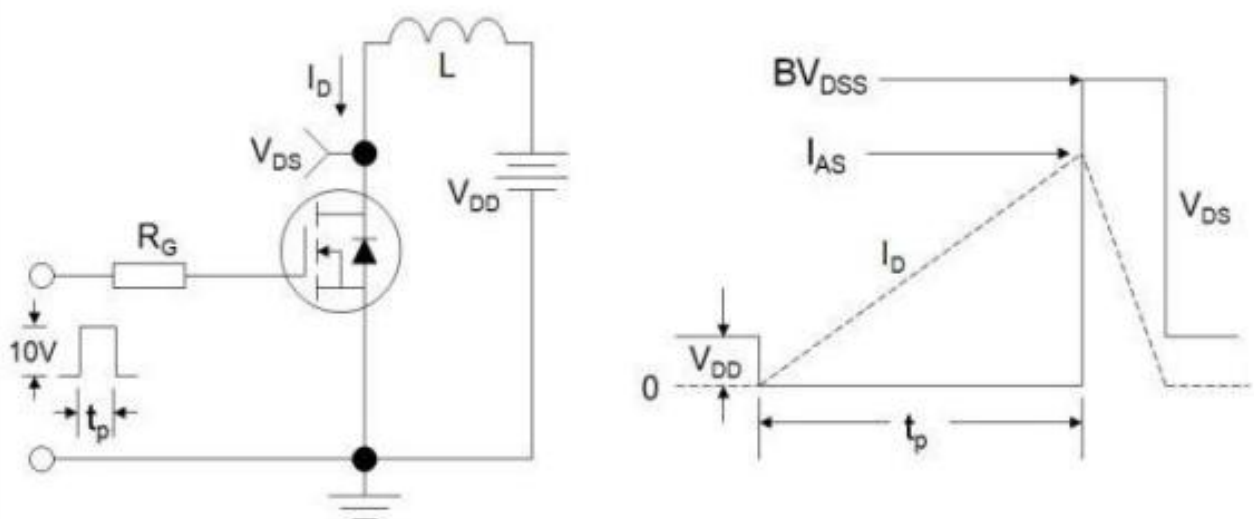
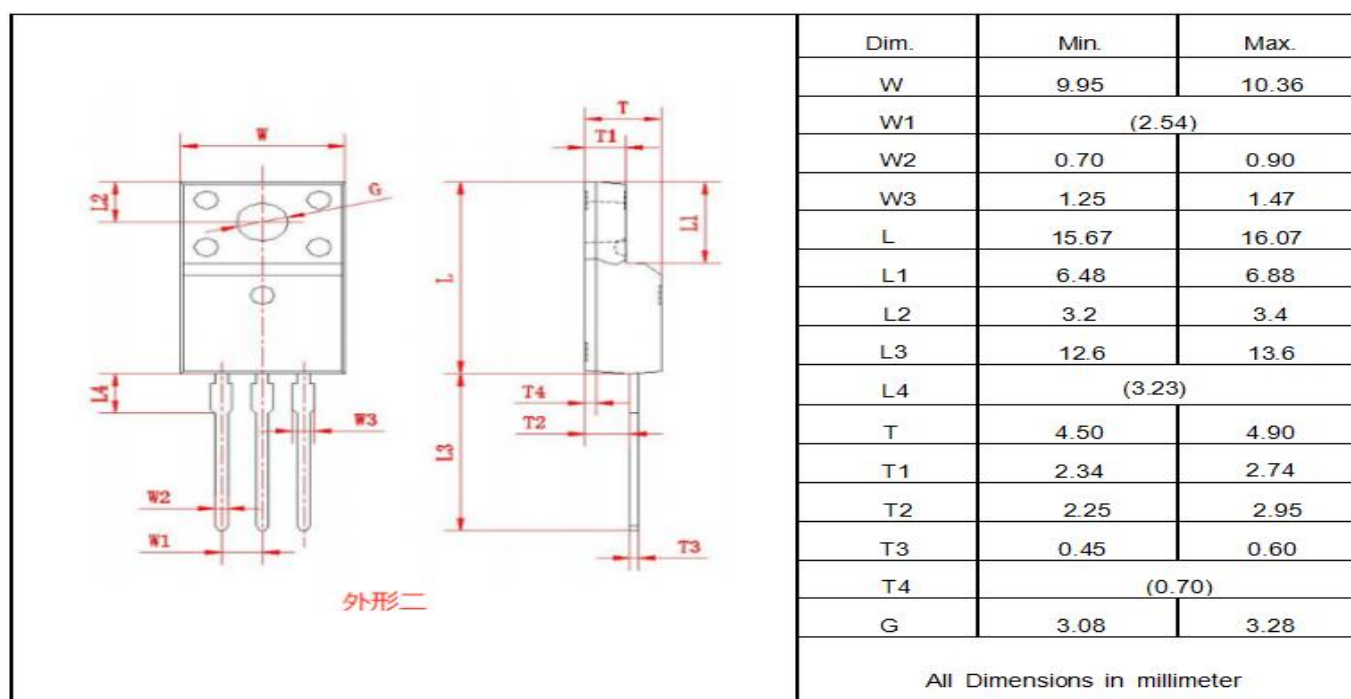
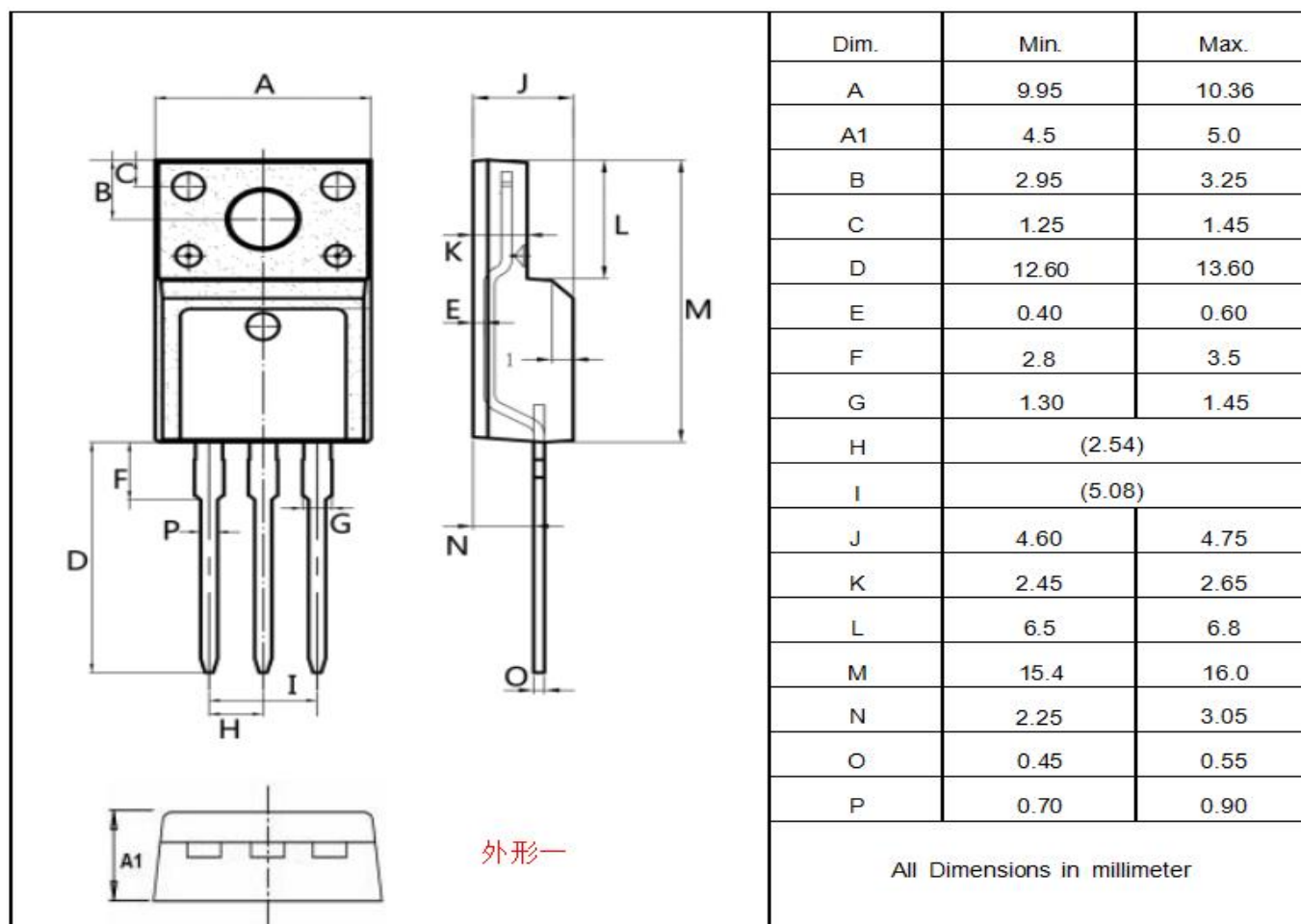


Figure C: Unclamped Inductive Switching Test Circuit and Waveform



Package outline drawing(TO-220F Unit: mm)


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