

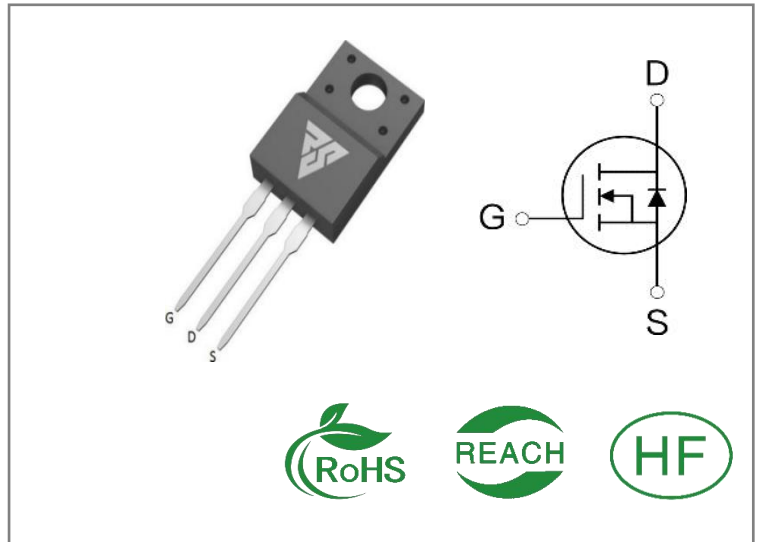
<b>ID</b>	<b>R<sub>Ds(ON)</sub>(Typ)</b>	<b>VDSS</b>
10A	0.7Ω	650V

**Applications:**

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

**Features:**

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


**Ordering Information**

Part Number	Package	Marking	Packing	Qty.
RS10N65F	T0-220F	RS10N65F	Tube	50 PCS

**Absolute Maximum Ratings** Tc= 25°C unless otherwise specified

Symbol	Parameter	RS10N65F	Units
VDSS	Drain-to-Source Voltage	650	V
ID	Continuous Drain Current TC=25°C	10	A
IDM	Pulsed Drain Current (Note*1)	40	
PD	Power Dissipation	39	W
VGS	Gate- to- Source Voltage	±30	V
EAS	Single Pulse Avalanche Energy L = 10mH, VDD = 50V, RG = 25 Ω	320	mJ
TL TPKG	Maximum Temperature for Soldering	300 260	°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	RS10N65F	Units	Test Conditions
R $\theta$ JC	Junction-to-Case	1.92	$^{\circ}\text{C} / \text{W}$	Drain lead soldered to water cooled heatsink, PD adjusted for a peak junction temperature of + 1 5 0 $^{\circ}\text{C}$
R $\theta$ JA	Junction-to-Ambient	62.5		1 cubic foot chamber, free air.

**OFF Characteristics**  $T_J = 25^{\circ}\text{C}$  unless otherwise specified

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
BVDSS	Drain- to- source Breakdown Voltage	650	--	--	V	$V_{GS}=0\text{V}, I_D=250\mu\text{A}$
IDSS	Drain- to- Source Leakage Current	--	--	1	$\mu\text{A}$	$V_{DS}=650\text{V}, V_{GS}=0\text{V}$
IGSS	Gate- to- Source Forward Leakage	--	--	100	nA	$V_{GS}=30\text{V}, V_{DS}=0\text{V}$
	Gate- to- Source Reverse Leakage	--	--	-100		$V_{GS}=-30\text{V}, V_{DS}=0\text{V}$

**ON Characteristics**  $T_J = 25^{\circ}\text{C}$  unless otherwise specified

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
RDS(on)	Static Drain- to- Source On-Resistance(Note*2)	--	0.7	0.84	$\Omega$	$V_{GS}=10\text{V}, I_D=5\text{A}$
VGS(TH)	Gate Threshold Voltage	3	--	4	V	$V_{GS}=V_{DS}, I_D=250\mu\text{A}$

**Resistive Switching Characteristics** Essentially independent of operating temperature

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
td(ON)	Turn- on Delay Time	--	45	--	nS	$V_{DS}=325\text{V}$ $I_D=10\text{A}$ $R_G=25\Omega$
trise	Rise Time	--	29	--		
td(OFF)	Turn- OFF Delay Time	--	201	--		
tfall	Fall Time	--	69	--		

**Dynamic Characteristics** Essentially independent of operating temperature

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
Ciss	Input Capacitance	--	1377	--	pF	VGS=0V VDS=25V f=1.0MHz
Coss	Output Capacitance	--	138	--		
Crss	Reverse Transfer Capacitance	--	18	--		
Qg	Total Gate Charge	--	48	--	nC	VDS=520V ID=10A VGS=10V
Qgs	Gate- to- Source Charge	--	7	--		
Qgd	Gate-to-Drain(" Miller") Charge	--	23	--		

**Source- Drain Diode Characteristics**

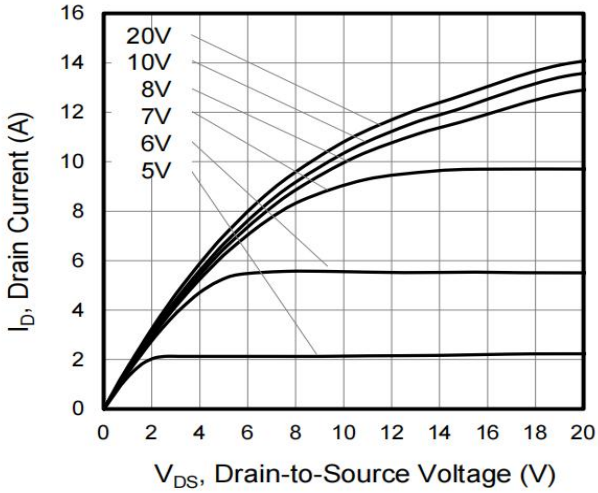
Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
IS	Continuous Source Current	--	--	10	A	Integral pn- diode in MOSFET
ISM	Maximum Pulsed Current	--	--	40	A	
VSD	Diode Forward Voltage	--	--	1.4	V	IS=5A,VGS=0V
trr	Reverse Recovery Time	--	524	--	nS	VGS=0V IS=10A,di/dt=100 A/μs
Qrr	Reverse Recovery Charge	--	2.7	--	μC	

**Notes:**

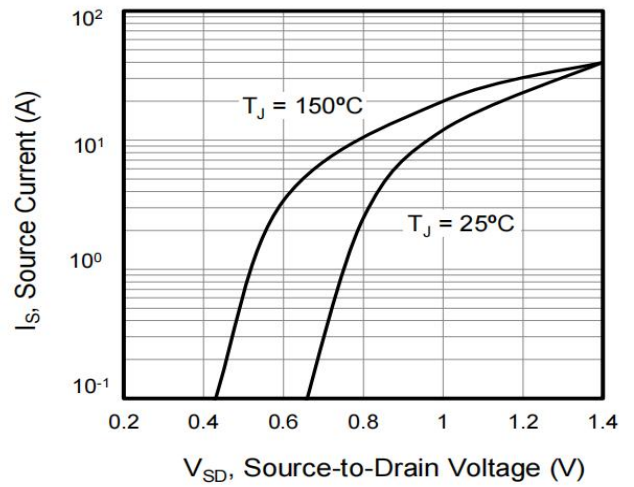
- \* 1. Repetitive rating, pulse width limited by maximum junction temperature.
- \* 2. Pulse Test: Pulse width  $\leq 300\mu\text{s}$ , Duty Cycle  $\leq 1\%$

**Typical Feature Curve**

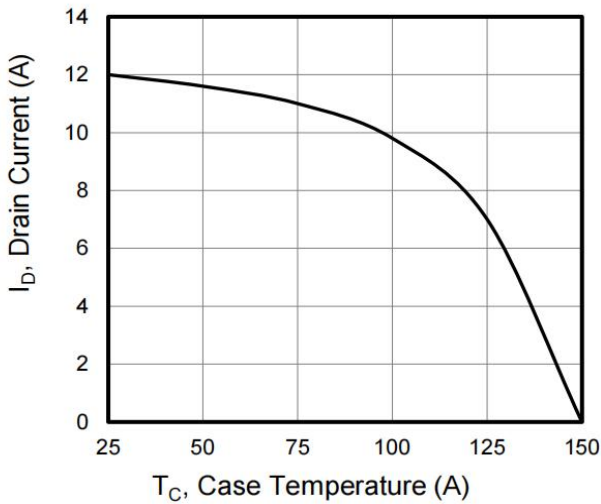
**Figure 1. Output Characteristics ( $T_J = 25^\circ\text{C}$ )**



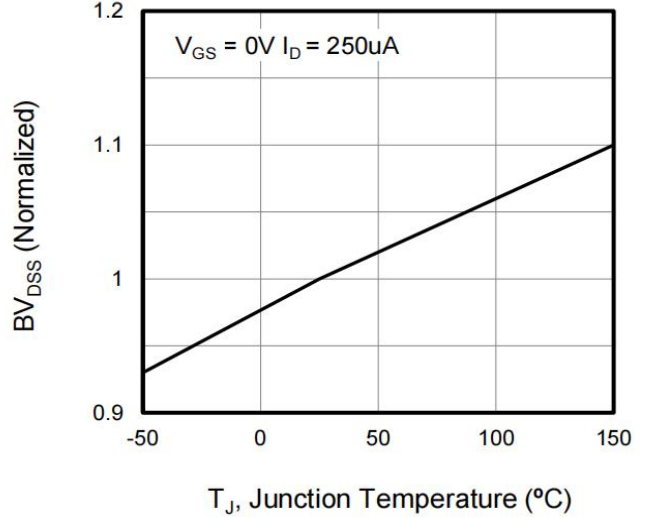
**Figure 2. Body Diode Forward Voltage**



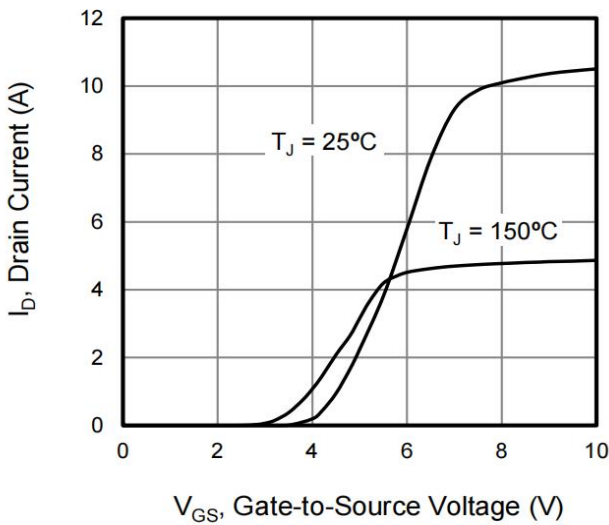
**Figure 3. Drain Current vs. Temperature**



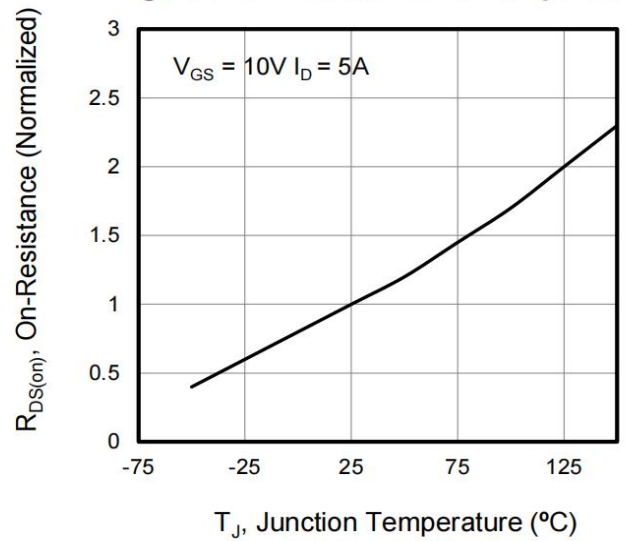
**Figure 4.  $BV_{DSS}$  Variation vs. Temperature**



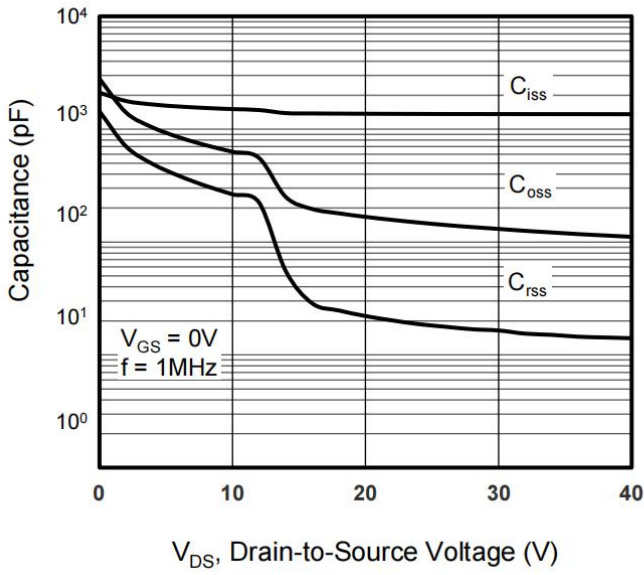
**Figure 5. Transfer Characteristics**



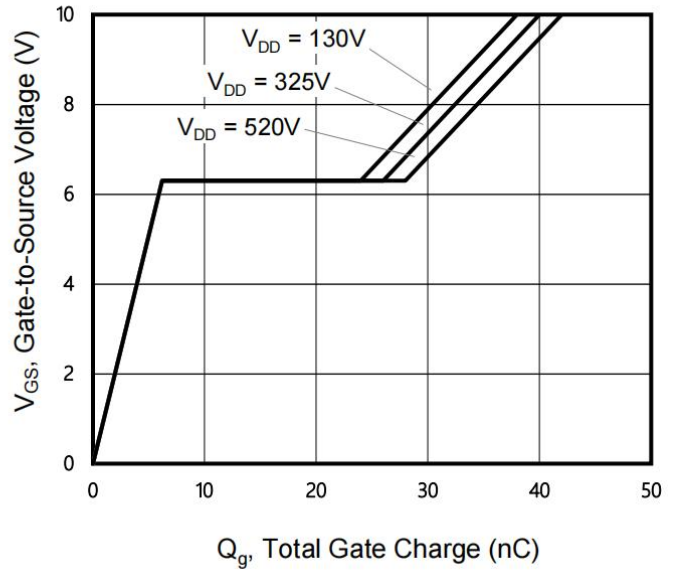
**Figure 6. On-Resistance vs. Temperature**



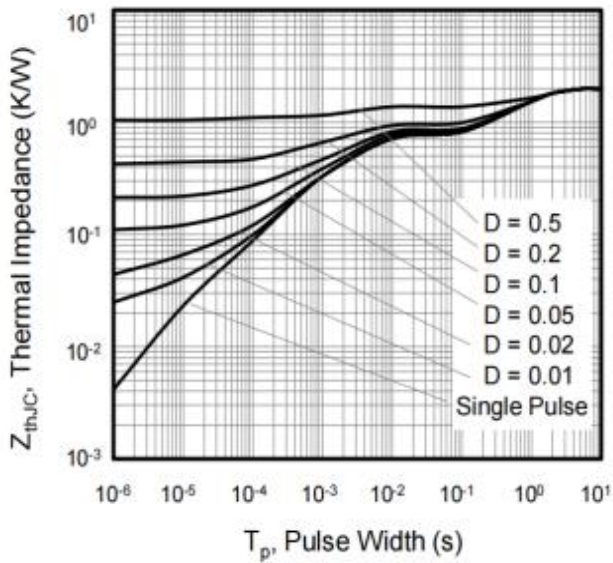
**Figure 7. Capacitance**



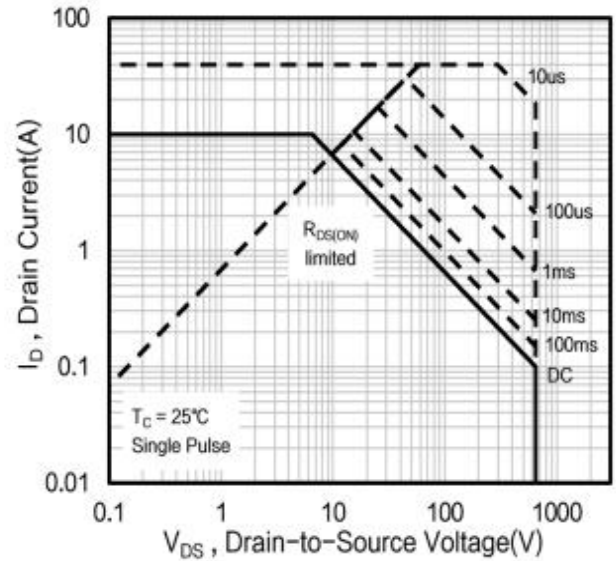
**Figure 8. Gate Charge**



**Figure 9. Transient Thermal Impedance**

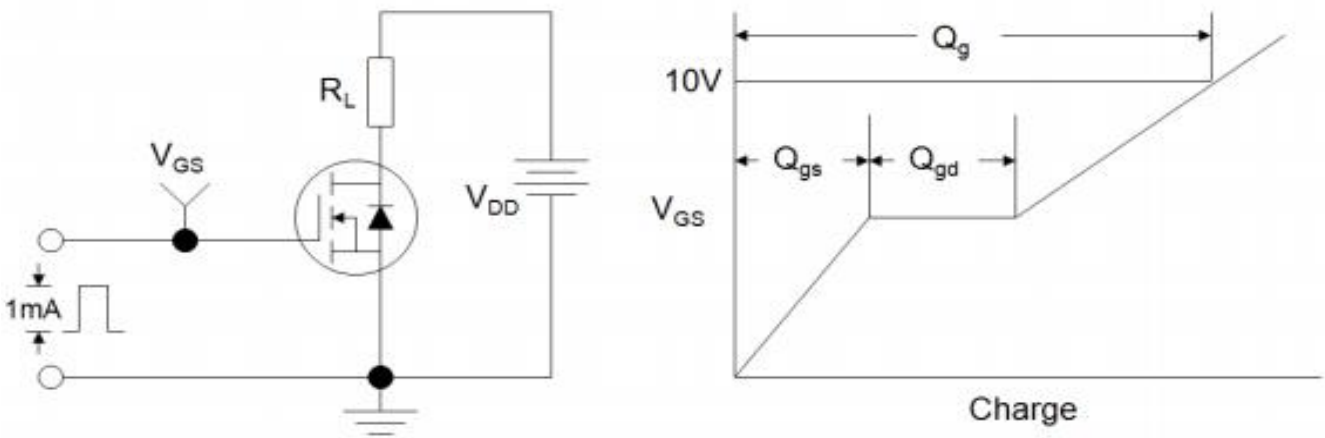


**Figure 10. Maximum Safe Operating Area**

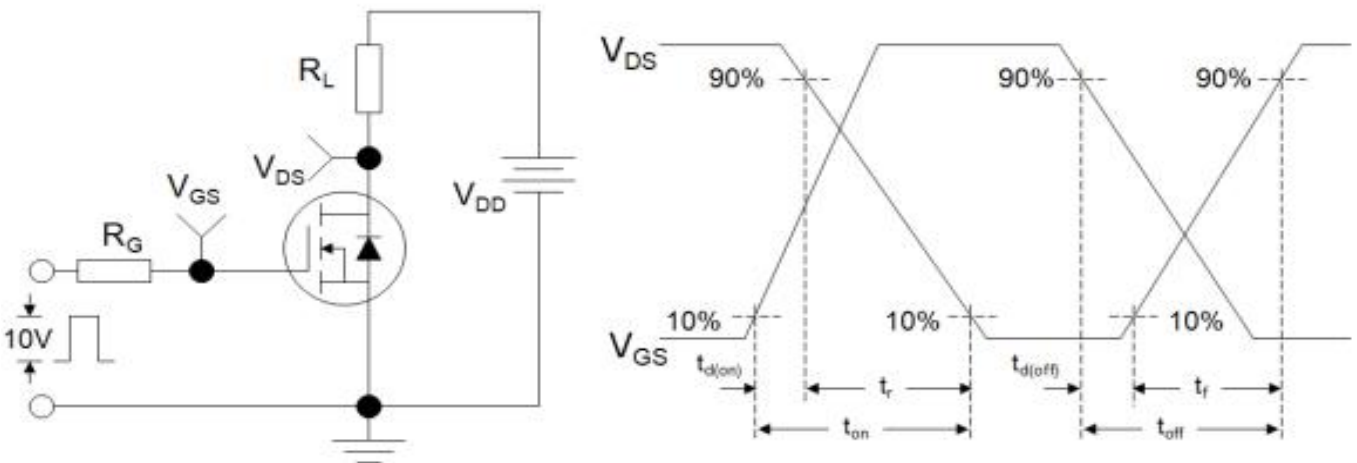


**Test Circuits and Waveforms**

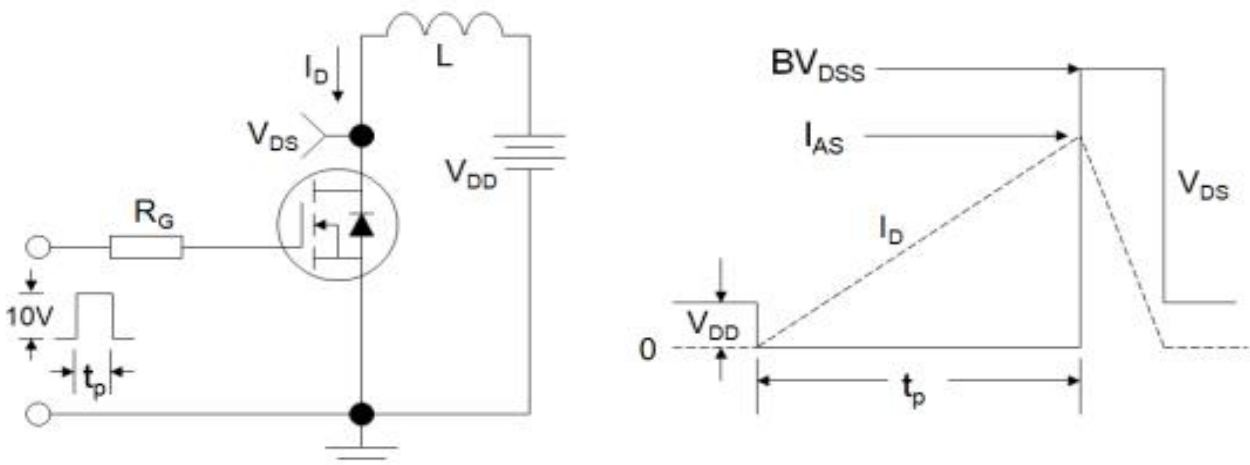
**Figure A: Gate Charge Test Circuit and Waveform**



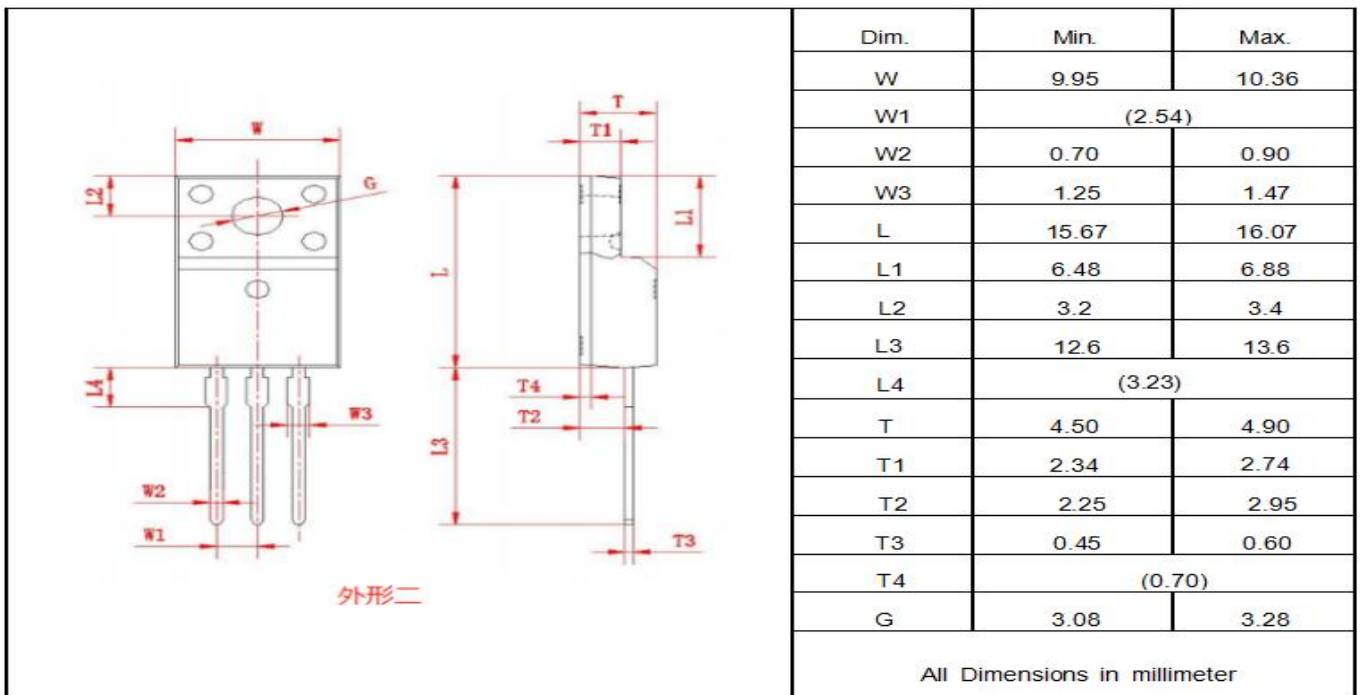
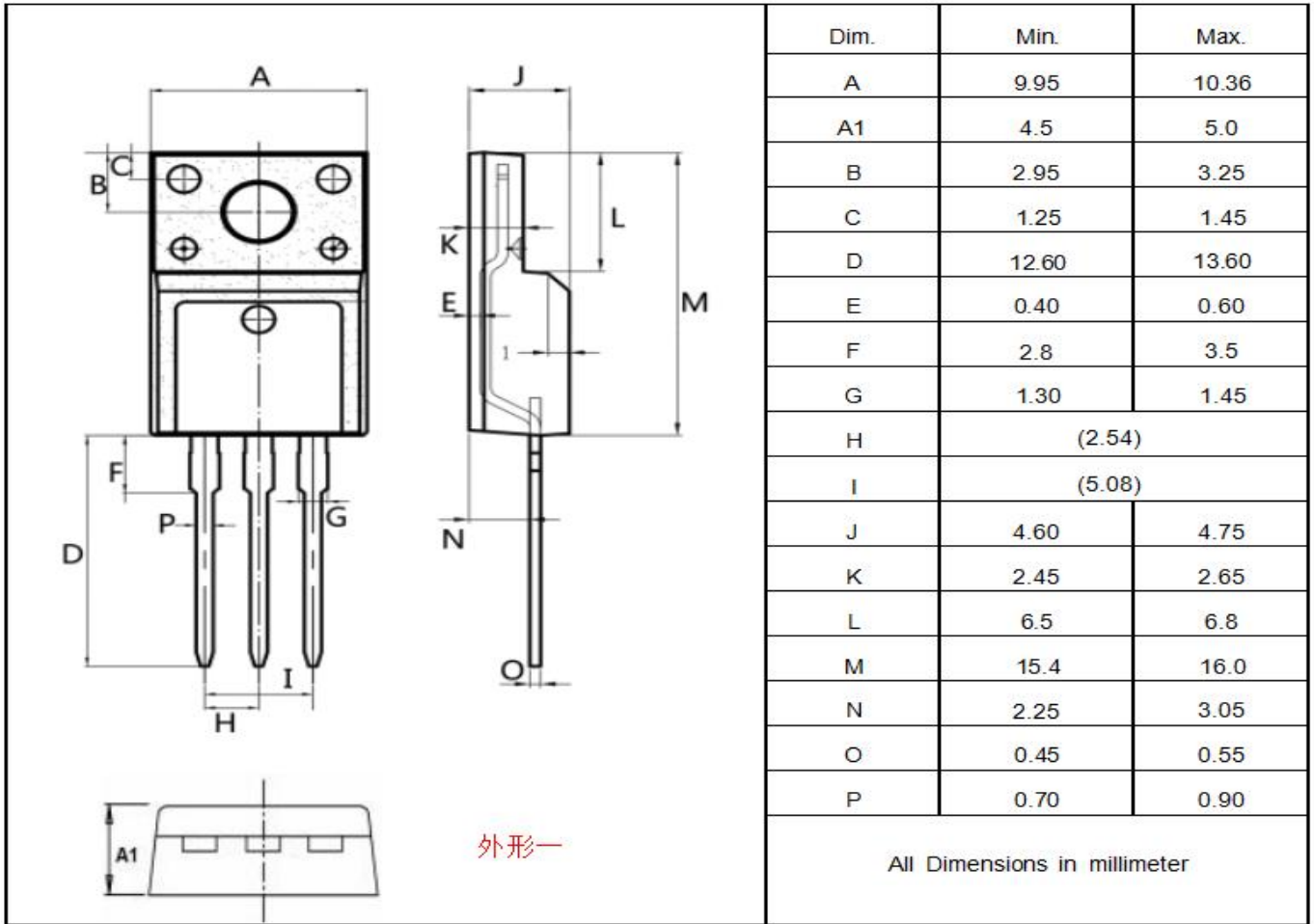
**Figure B: Resistive Switching Test Circuit and Waveform**



**Figure C: Unclamped Inductive Switching Test Circuit and Waveform**



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



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