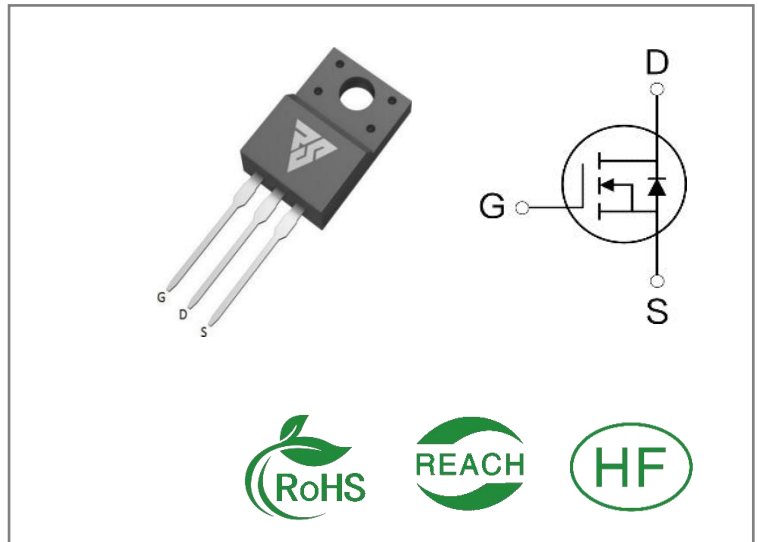


ID	R <sub>Ds(ON)</sub> (Typ)	VDSS
9A	420mΩ	800V


**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

**Ordering Information**

Part Number	Package	Marking	Packing	Qty.
RS80R500F	T0-220F	RS80R500F	Tube	50 PCS

**Absolute Maximum Ratings** T<sub>c</sub>= 25°C unless otherwise specified

Symbol	Parameter	RS80R500F	Units
VDSS	Drain-to-Source Voltage	800	V
ID	Continuous Drain Current TC=25°C	9	A
ID	Continuous Drain Current TC=100°C	5.5	
IDM	Pulsed Drain Current (Note*1)	27	
PD	Power Dissipation	52	W
VGS	Gate- to- Source Voltage	±30	V
EAS	Single Pulse Avalanche Energy L=10mH,VDS= 50V, RG = 25 Ω, TC=25°C	270	mJ
dv/dt	MOSFET dv/ dt ruggednessVDS = 0...400V	50	V/ns
dv/dt	Reverse diode dv/dt VDS = 0...400V, Tj = 25°C, ISD≤ID	15	V/ns
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	RS80R500F	Units	Test Conditions
R $\theta$ JC	Junction-to-Case	2.4	°C / W	Drain lead soldered to water cooled heatsink, PD adjusted for a peak junction temperature of + 1 5 0 °C
R $\theta$ JA	Junction-to-Ambient	67		1 cubic foot chamber, free air.

**OFF Characteristics** T<sub>J</sub>= 25°C unless otherwise specified

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
BVDSS	Drain- to- source Breakdown Voltage	800	--	--	V	VGS=0V, ID=250μA
IDSS	Drain- to- Source Leakage Current	--	--	1	μA	VDS=800V, 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** T<sub>J</sub>=25°C unless otherwise specified

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
RDS(on)	Static Drain- to- Source On-Resistance(Note*2)	--	420	500	mΩ	VGS=10V, ID=4.5A
VGS(TH)	Gate Threshold Voltage	2.5	--	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	--	28	--	nS	VDS=400V ID=9A RG=25Ω
trise	Rise Time	--	34	--		
td(OFF)	Turn- OFF Delay Time	--	100	--		
tfall	Fall Time	--	28	--		

**Dynamic Characteristics** Essentially independent of operating temperature

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
Ciss	Input Capacitance	--	1099	--	pF	VGS=0V VDS=100V f=1.0MHz
Coss	Output Capacitance	--	52	--		
Crss	Reverse Transfer Capacitance	--	1	--		
Qg	Total Gate Charge	--	24.6	--	nC	VDS=400V ID=9A VGS=10V
Qgs	Gate- to- Source Charge	--	5.6	--		
Qgd	Gate-to-Drain(" Miller") Charge	--	9	--		

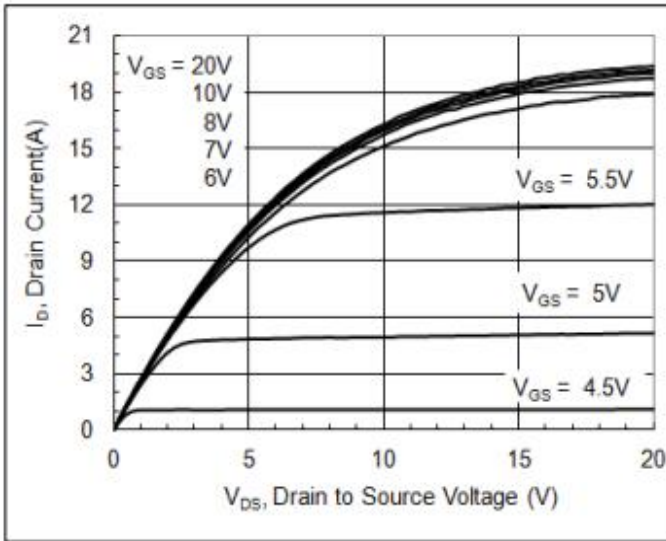
**Source- Drain Diode Characteristics**

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
IS	Continuous Source Current	--	--	9	A	Integral pn- diode in MOSFET
ISM	Maximum Pulsed Current	--	--	27	A	
VSD	Diode Forward Voltage	--	--	1.3	V	IS=9A,VGS=0V
trr	Reverse Recovery Time	--	258	--	nS	VR=100V IS=9A,di/dt=100A /μs
Qrr	Reverse Recovery Charge	--	3.15	--	μC	

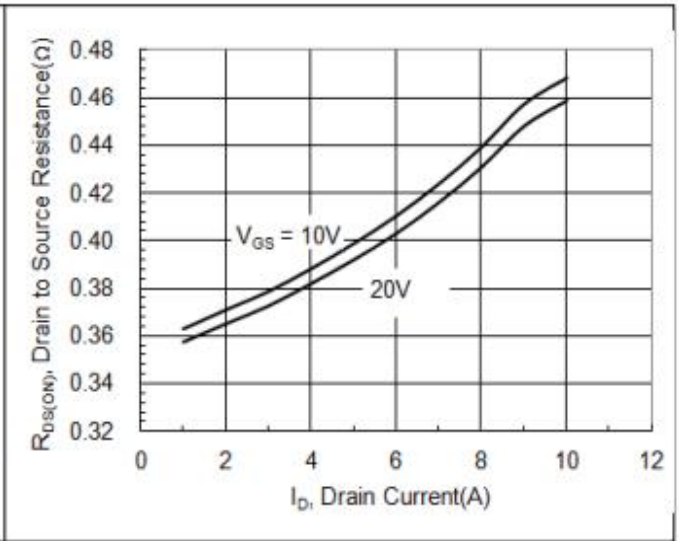
**Notes:**

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

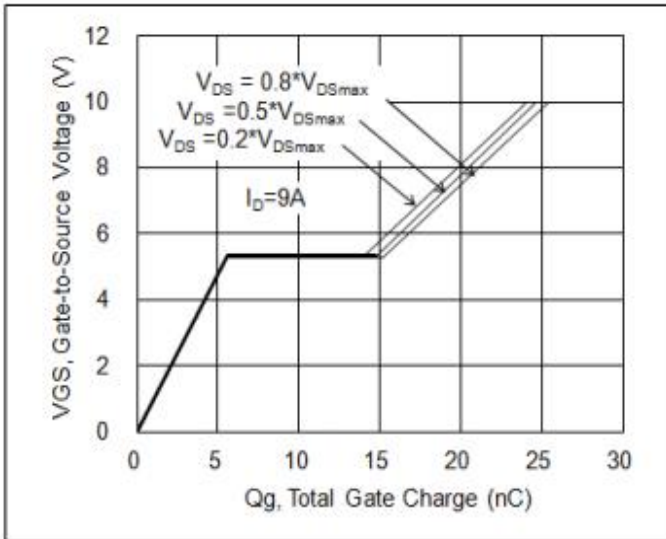
**Typical Feature Curve**



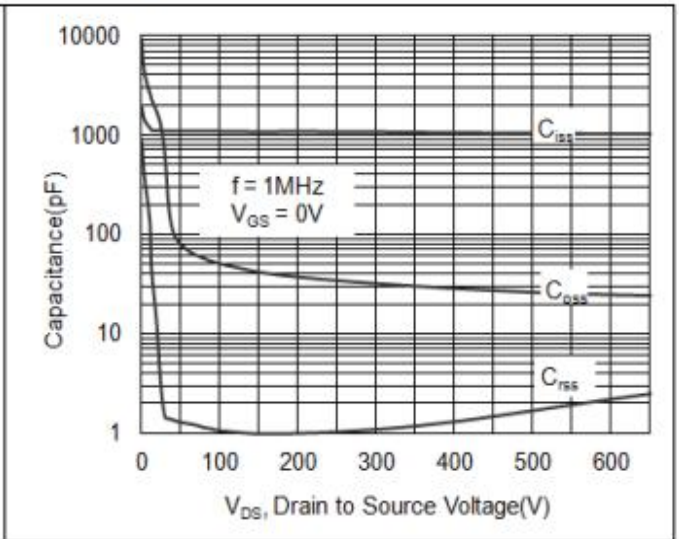
**Fig1. Output characteristics**



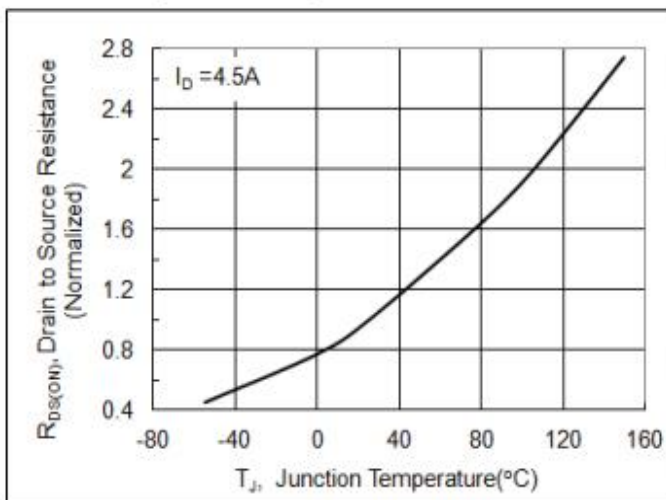
**Fig2. Drain-source on-state resistance**



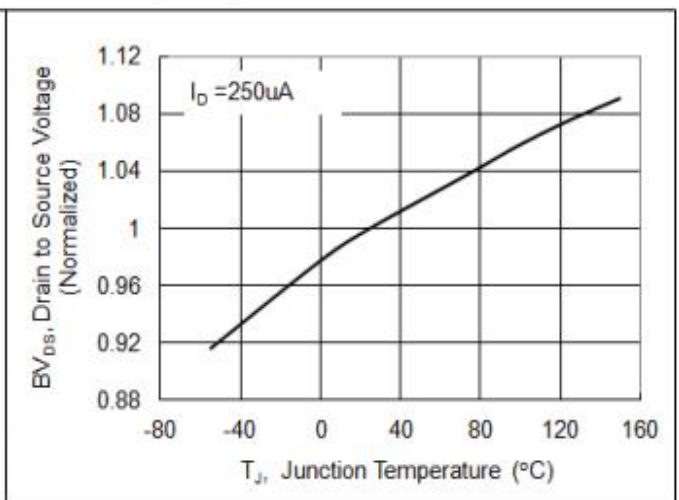
**Fig3. Gate charge characteristics**



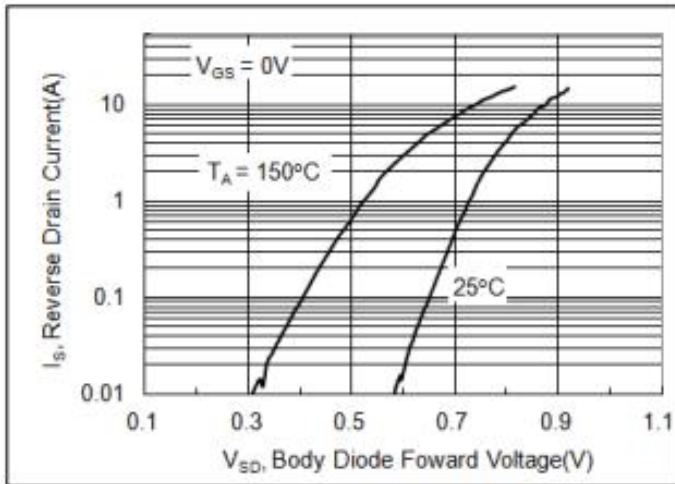
**Fig4. Capacitance Characteristics**



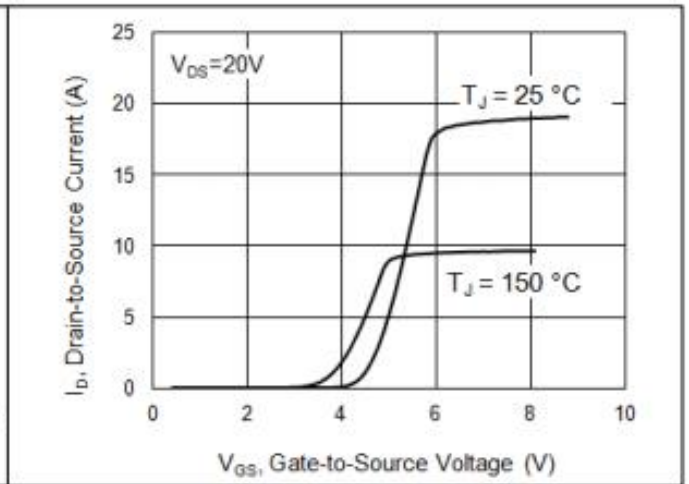
**Fig5. RDS(ON) vs junction temperature**



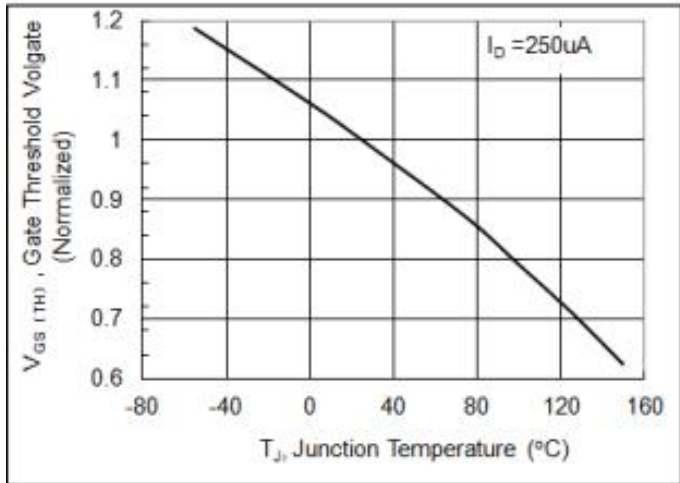
**Fig6. BVDS vs junction temperature**



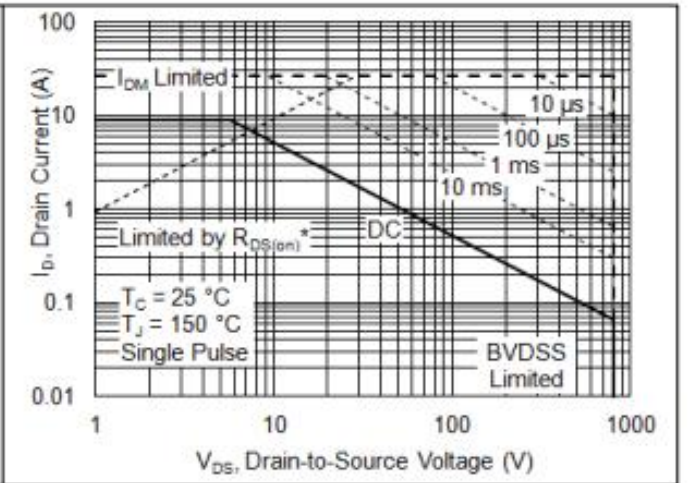
**Fig 7 . Forward characteristics of reverse diode**



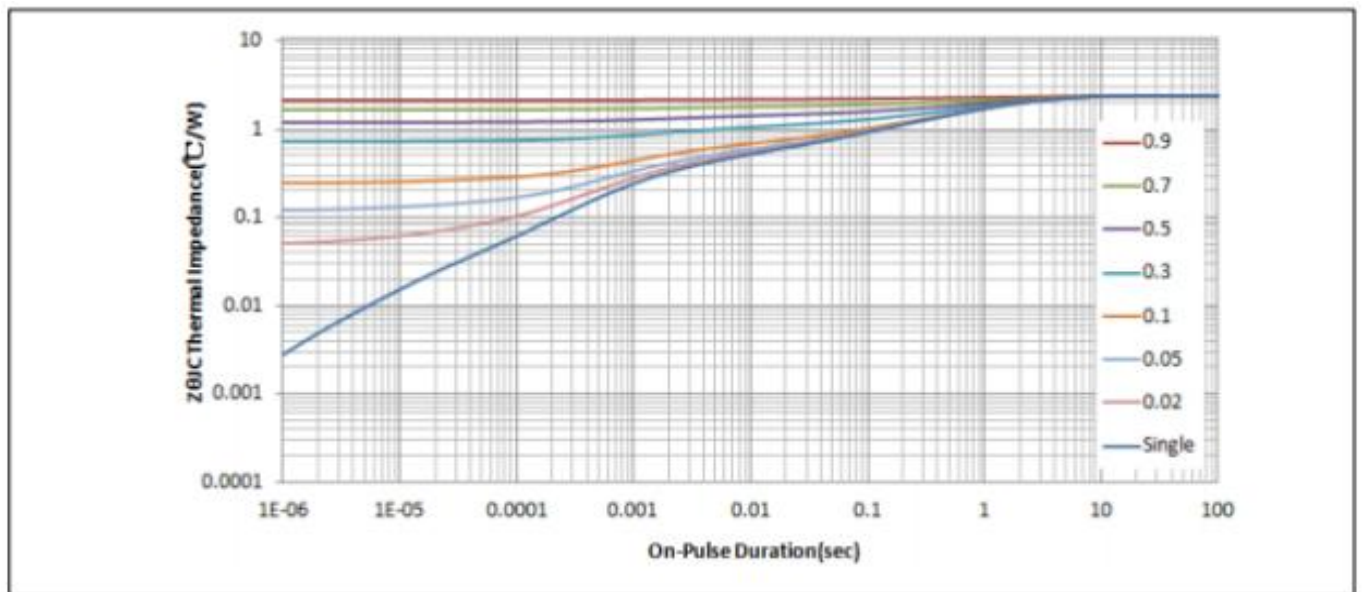
**Fig 8 . Transfer characteristics**



**Fig 9 .  $V_{GS(TH)}$  vs junction temperature**



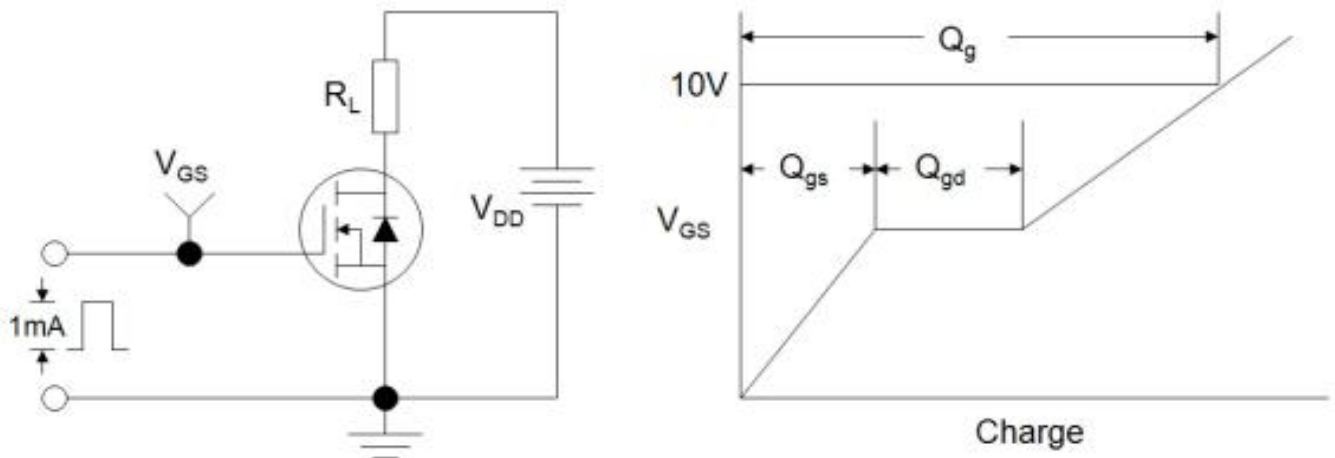
**Fig 10 . Safe operating area(TO-220F)**



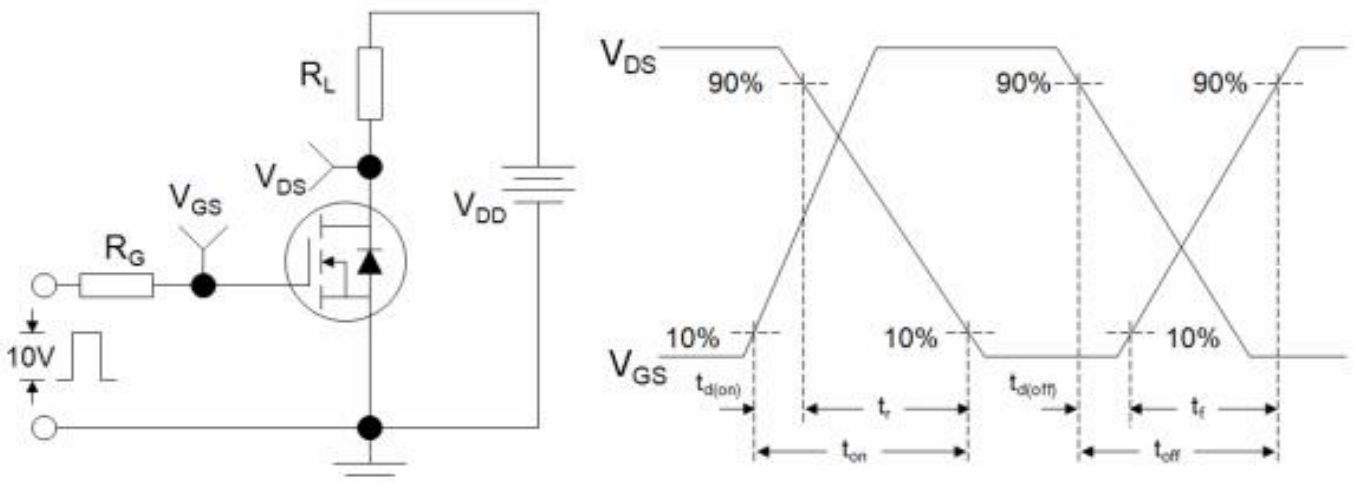
**Fig 11 . Transient thermal impedance**

**Test Circuits and Waveforms**

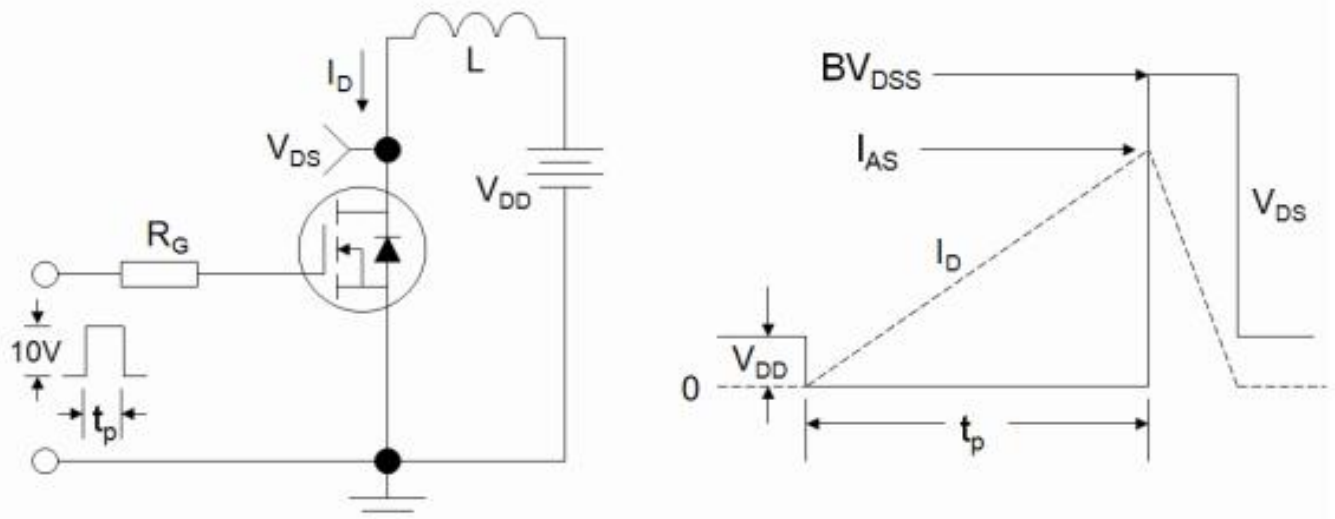
**Figure A: Gate Charge Test Circuit and Waveform**



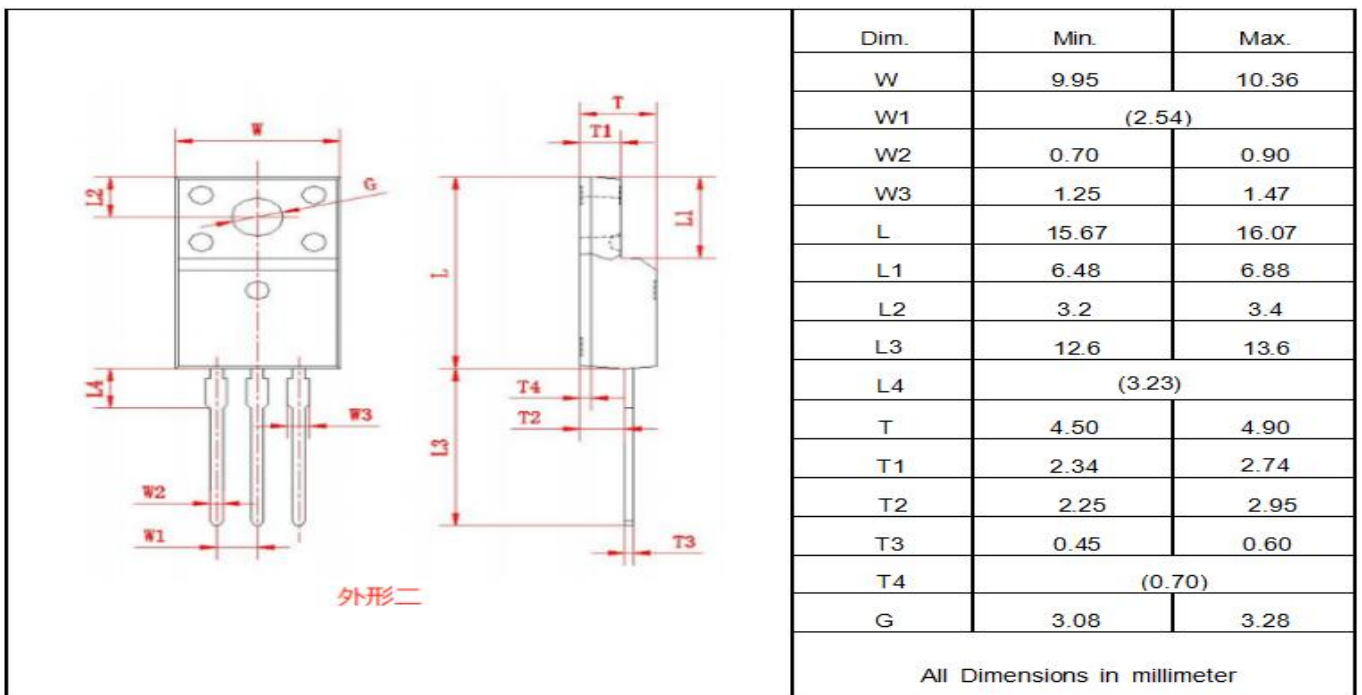
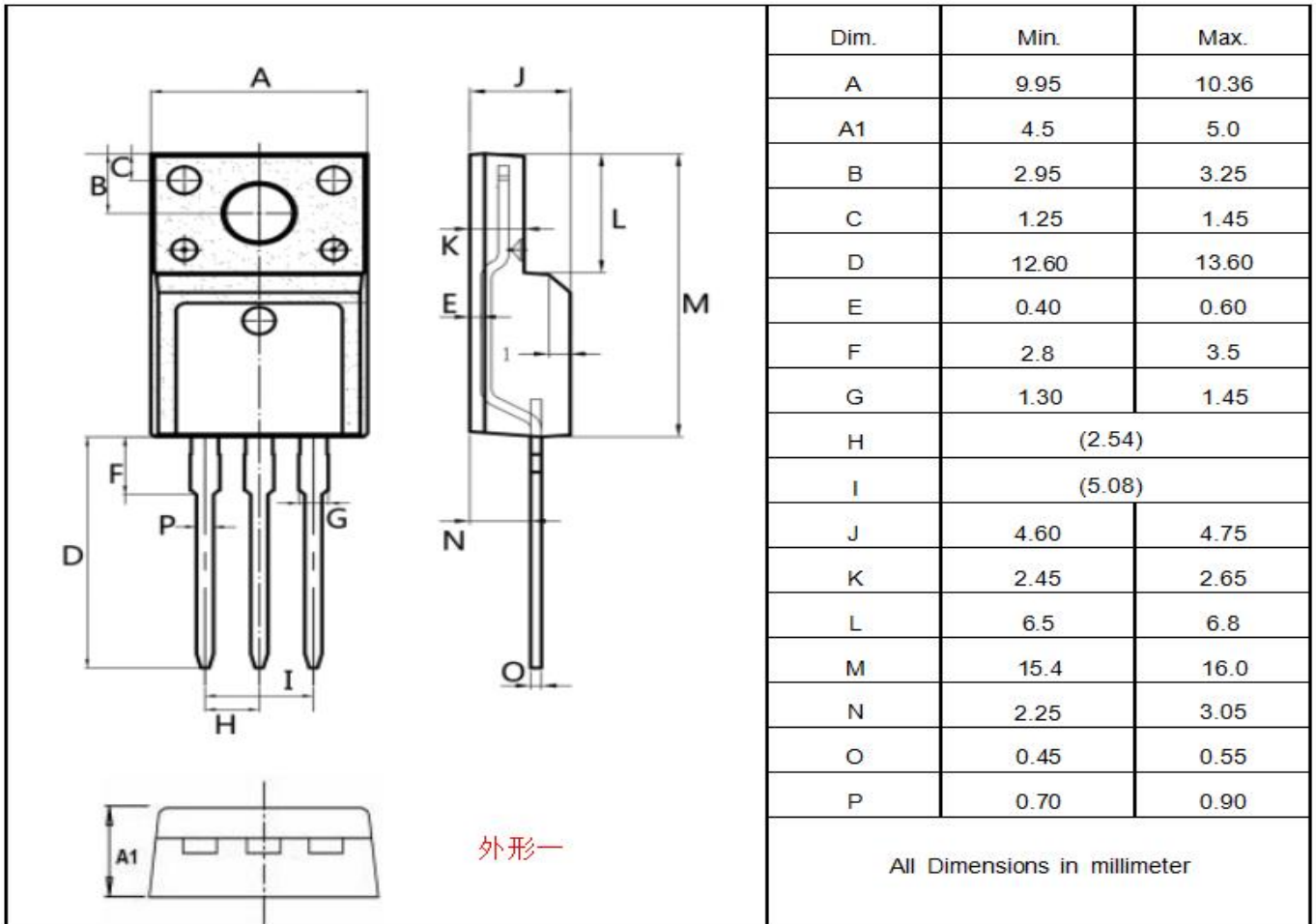
**Figure B: Resistive Switching Test Circuit and Waveform**



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



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



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