

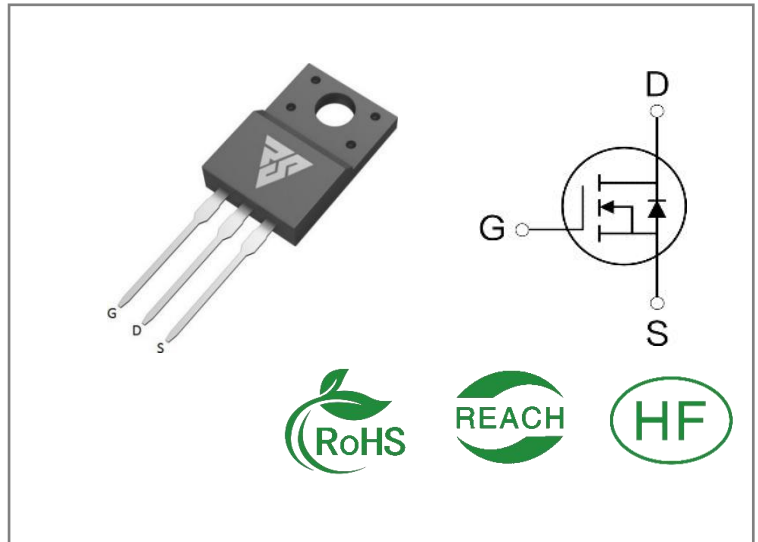
ID	$R_{DS(ON)}$ (Typ)	VDSS
13.8A	240mΩ	650V

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.
RS65R280BF	T0-220F	RS65R280BF	Tube	50 PCS

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

Symbol	Parameter	RS65R280BF	Units
VDSS	Drain-to-Source Voltage	650	V
ID	Continuous Drain Current $T_C = 25^\circ\text{C}$	13.8	A
ID	Continuous Drain Current $T_C = 100^\circ\text{C}$	8.7	
IDM	Pulsed Drain Current (Note*1)	42	
PD	Power Dissipation	33	W
VGS	Gate- to- Source Voltage	± 30	V
EAS	Single Pulse Avalanche Energy $L = 10\text{mH}, V_{DS} = 50\text{V}, R_G = 25\ \Omega, T_C = 25^\circ\text{C}$	260	mJ
dv/dt	MOSFET dv/ dt ruggedness $V_{DS} = 0 \dots 400\text{V}$	50	V/ns
dv/dt	Reverse diode dv/dt $V_{DS} = 0 \dots 400\text{V}, T_j = 25^\circ\text{C}, I_{SD} \leq I_D$	15	V/ns
TL TPKG	Maximum Temperature for Soldering	300	$^\circ\text{C}$
	Leads at 0.063in(1.6mm)from Case for 10 seconds Package Body for 10 seconds	260	
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	RS65R280BF	Units	Test Conditions
R θ JC	Junction-to-Case	3.8	$^{\circ}\text{C} / \text{W}$	Drain lead soldered to water cooled heatsink, PD adjusted for a peak junction temperature of + 1 5 0 $^{\circ}\text{C}$
R θ JA	Junction-to- Ambient	80		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	VGS=0V ID=250 μA
IDSS	Drain- to- Source Leakage Current	--	--	1	μA	VDS=650V 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 $T_J = 25^{\circ}\text{C}$ unless otherwise specified

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
RDS(on)	Static Drain- to- Source On-Resistance(Note*2)	--	240	280	m Ω	VGS=10V ID=4.5A
VGS(TH)	Gate Threshold Voltage	2	-	4	V	VGS=VDS ID=250 μA

Resistive Switching Characteristics Essentially independent of operating temperature

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
td(ON)	Turn- on Delay Time	--	24	--	nS	VDS=325V ID=13.8A RG=25 Ω
trise	Rise Time	--	41	--		
td(OFF)	Turn- OFF Delay Time	--	86	--		
tfall	Fall Time	--	37	--		

Dynamic Characteristics Essentially independent of operating temperature

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
Ciss	Input Capacitance	--	981	--	pF	VGS=0V VDS=50V f=1.0MHz
Coss	Output Capacitance	--	65	--		
Crss	Reverse Transfer Capacitance	--	3.6	--		
Qg	Total Gate Charge	--	26	--	nC	VDS=520V ID=13.8A VGS=10V
Qgs	Gate- to- Source Charge	--	4.9	--		
Qgd	Gate-to-Drain(" Miller") Charge	--	12	--		

Source- Drain Diode Characteristics

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
IS	Continuous Source Current	--	--	13.8	A	Integral pn- diode in MOSFET
ISM	Maximum Pulsed Current	--	--	42	A	
VSD	Diode Forward Voltage	--	--	0.85	V	IS=13.8A VGS=0V
trr	Reverse Recovery Time	--	302	--	nS	VR=100V IS=13.8A di/dt=100A/μs
Qrr	Reverse Recovery Charge	--	3.7	--	μC	

Notes:

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

Typical Feature Curve

Figure1. Output Characteristics

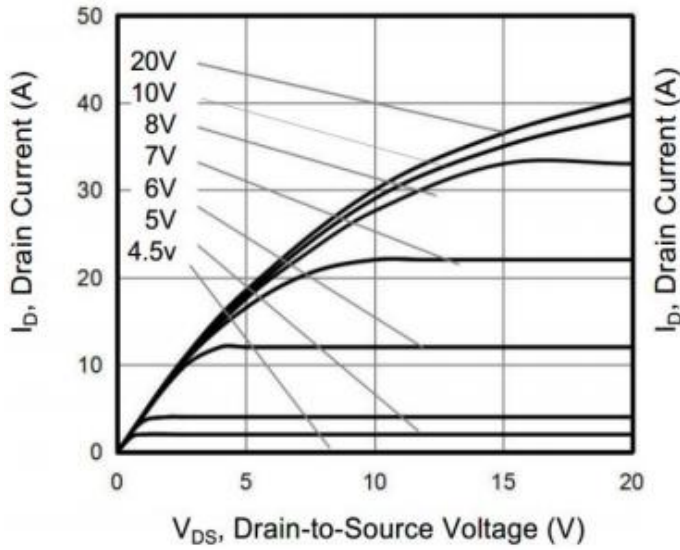


Figure2. Transfer Characteristics

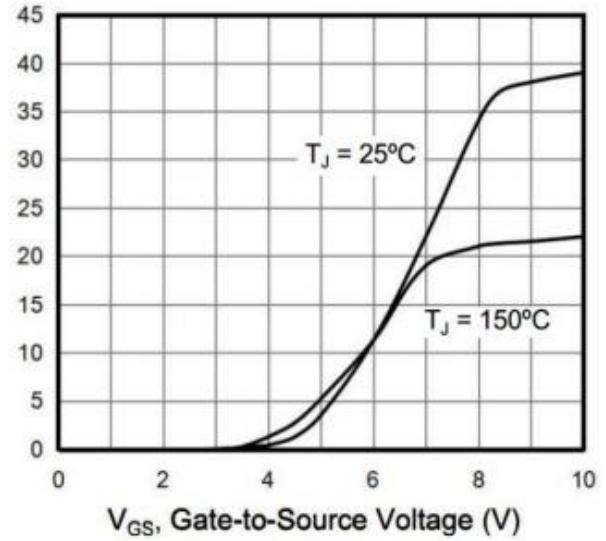


Figure 3. On-Resistance VS.Drain Current

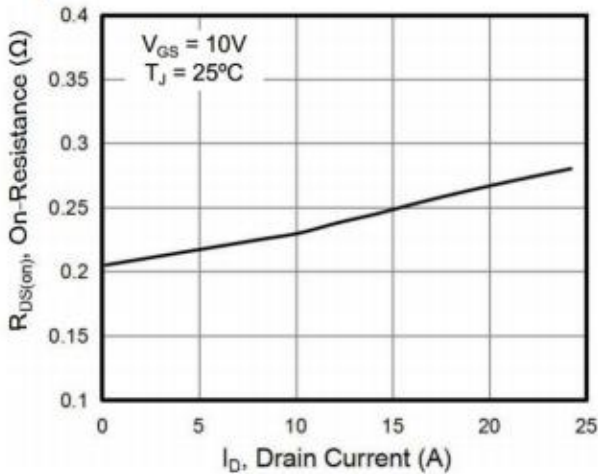


Figure 4. Capacitance

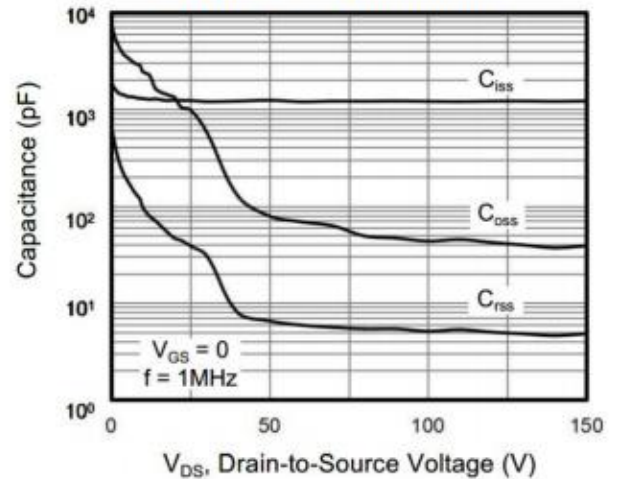


Figure 5. Gate Charge

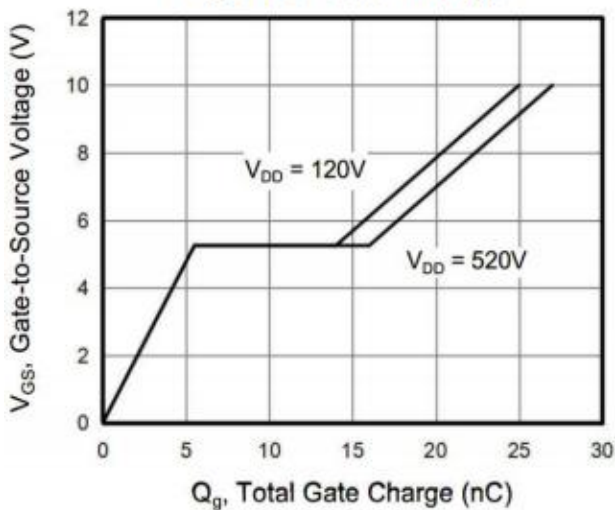


Figure 6. Body Diode Forward Voltage

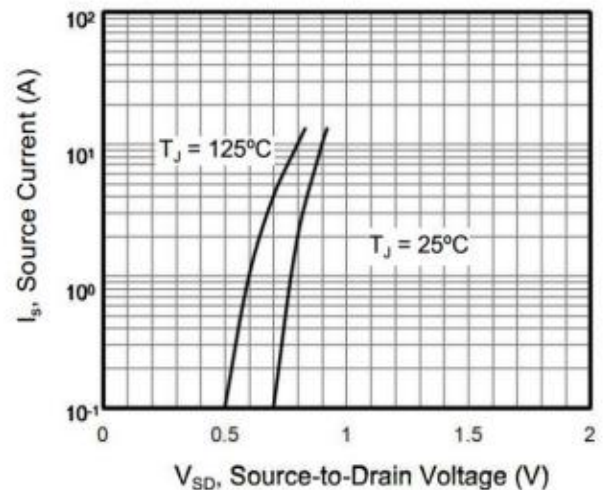


Figure 7. On-Resistance vs. Junction Temperature

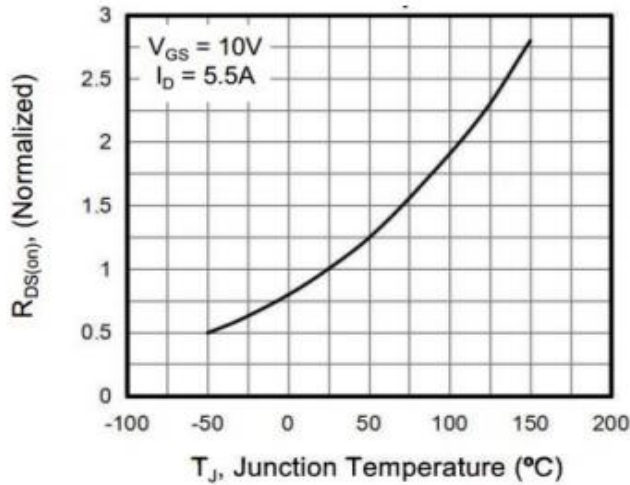


Figure 8. Threshold Voltage vs. Junction Temperature

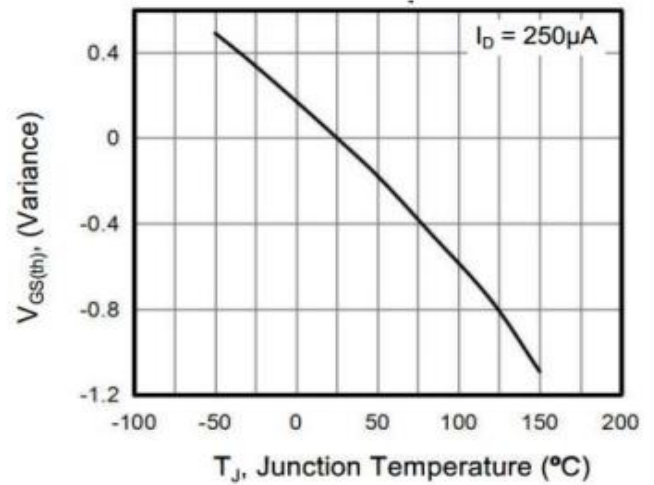


Figure 9. Breakdown voltage vs. Junction Temperature

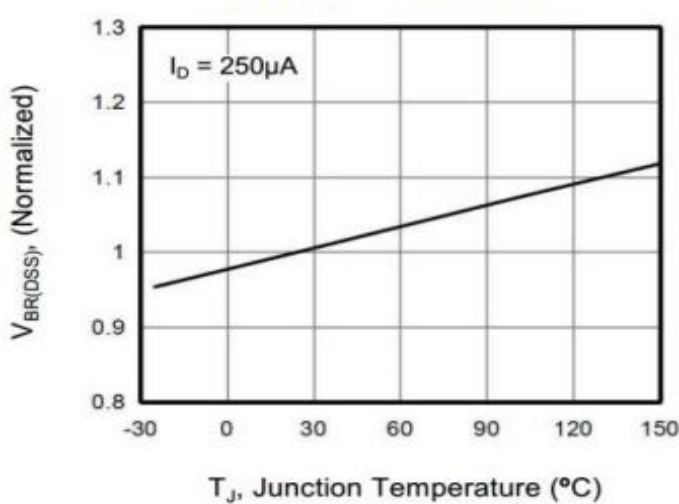


Figure 10. Transient Thermal Impedance

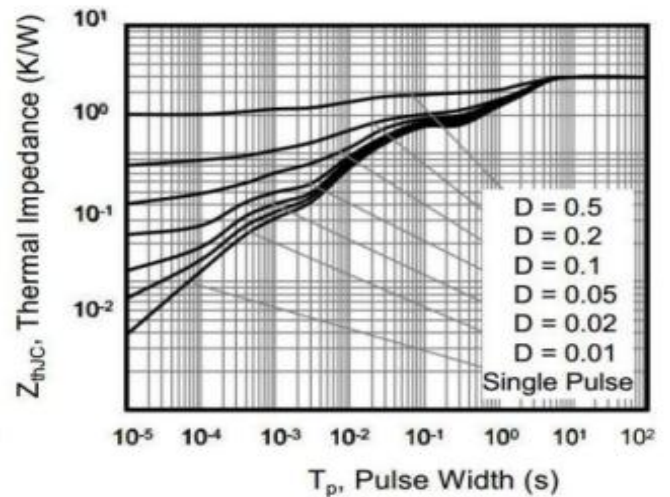
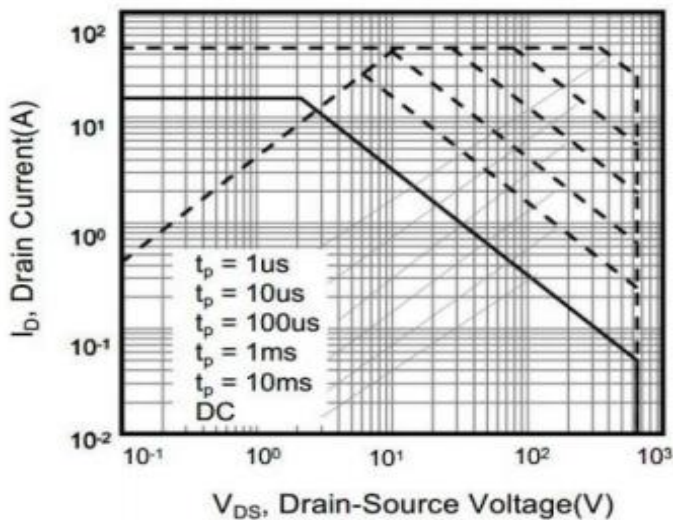


Figure 11. Safe operation area for



Test Circuits and Waveforms

Figure A: Gate Charge Test Circuit and Waveform

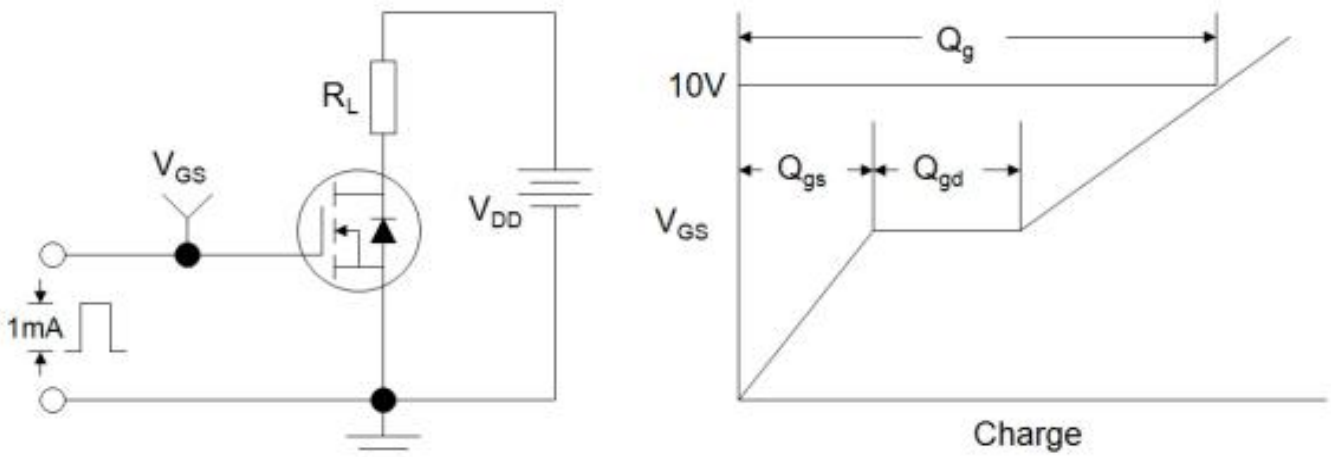


Figure B: Resistive Switching Test Circuit and Waveform

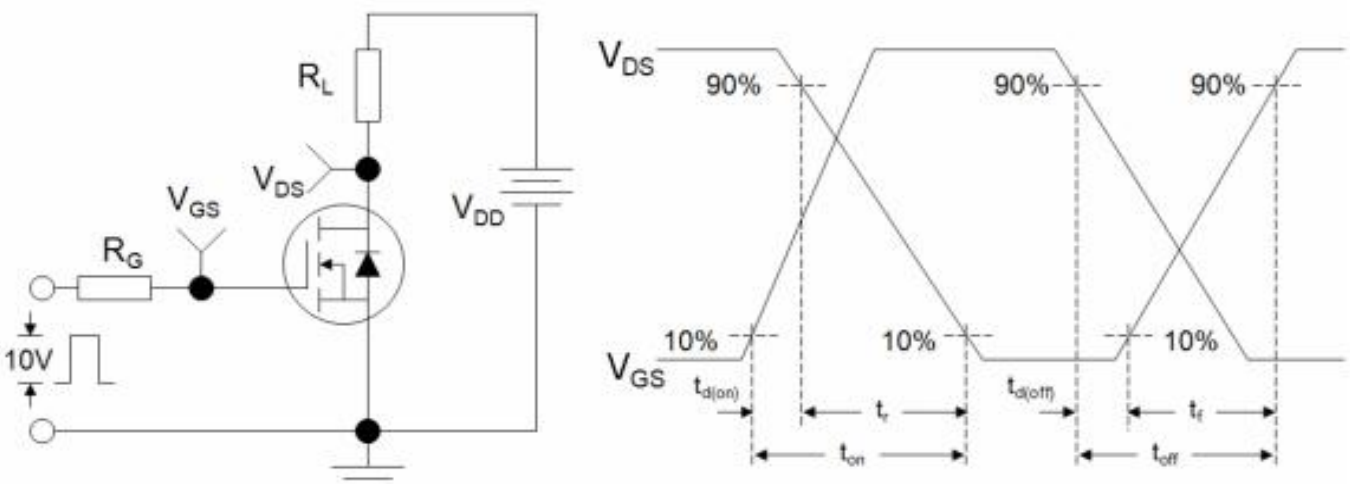
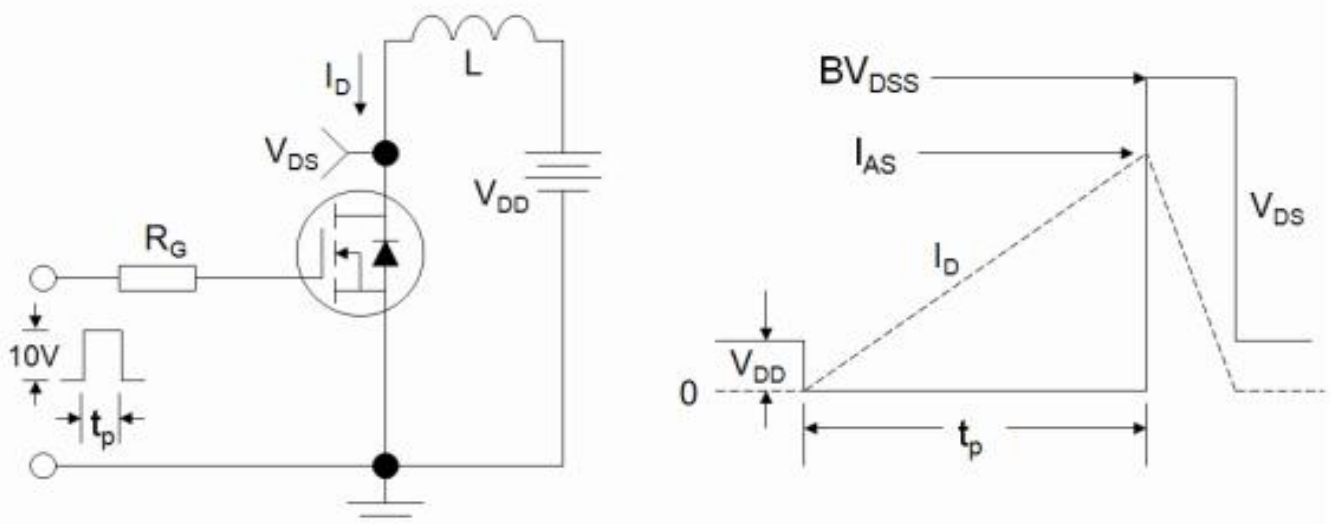
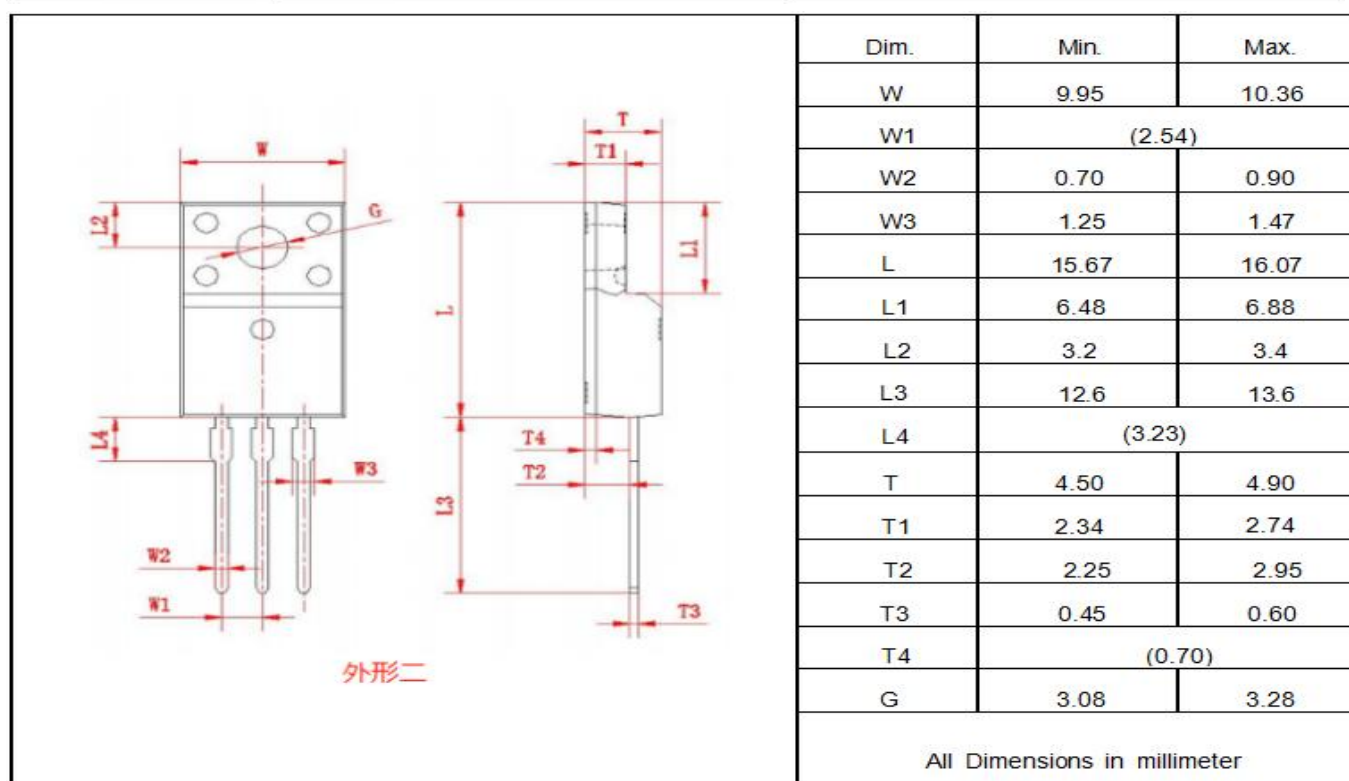
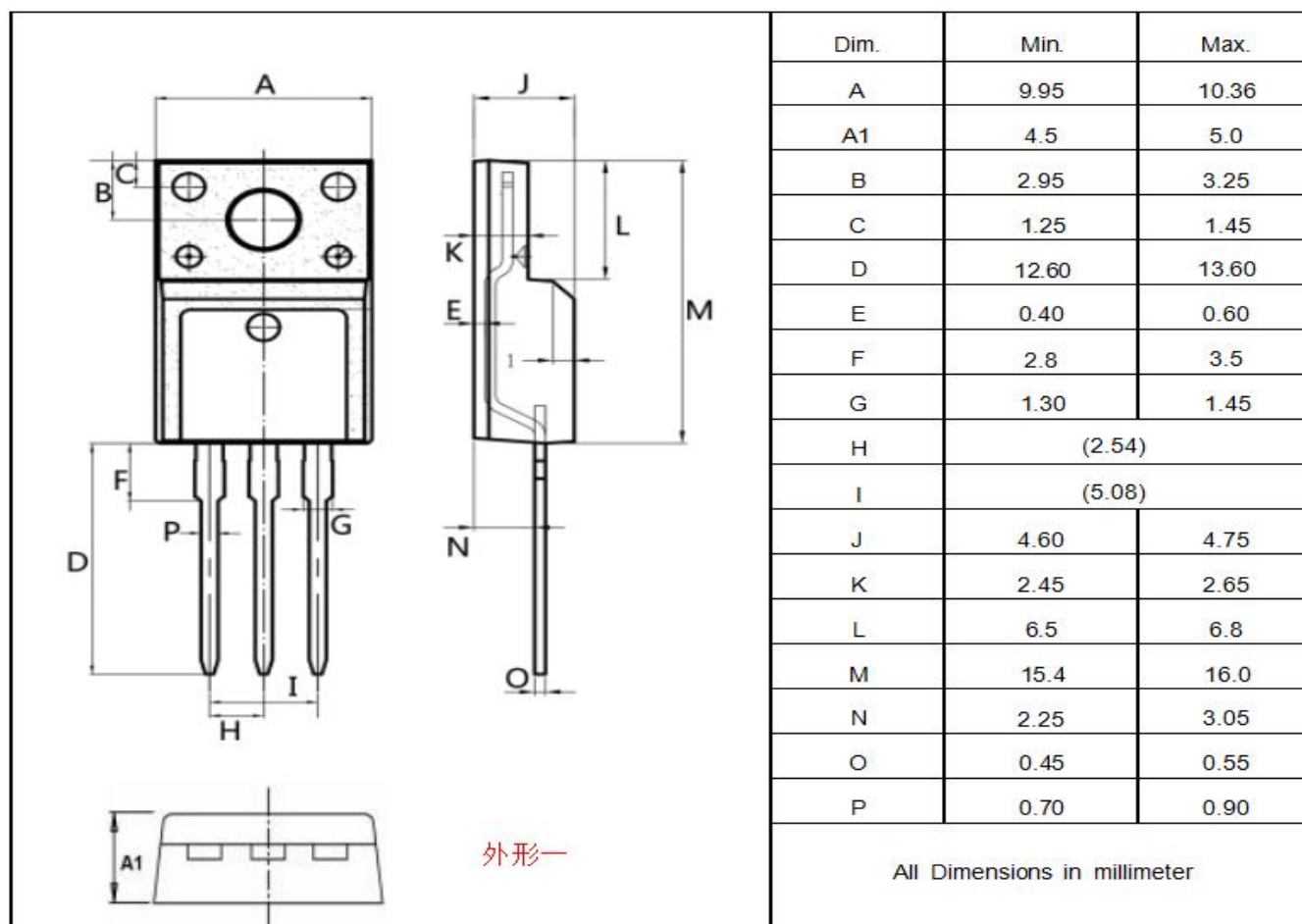


Figure C: Unclamped Inductive Switching Test Circuit and Waveform



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


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