

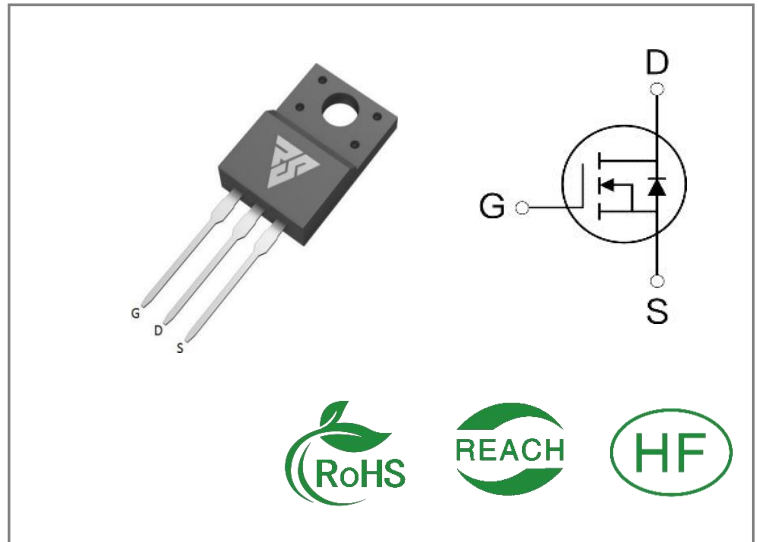
ID	R _{DS(ON)} (Typ)	VDSS
48A	58mΩ	600V

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.
RSF60R070F	T0-220F	RSF60R070F	Tube	50 PCS

Absolute Maximum Ratings Tc= 25°C unless otherwise specified

Symbol	Parameter	RSF60R070F	Units
VDSS	Drain-to-Source Voltage	600	V
ID	Continuous Drain Current TC=25°C	48	A
ID	Continuous Drain Current TC=100°C	30	
IDM	Pulsed Drain Current (Note*1)	144	
PD	Power Dissipation	39	W
VGS	Gate- to- Source Voltage	±30	V
EAS	Single Pulse Avalanche Energy L=10mH,VDS= 50V, RG = 25 Ω, TC=25°C	375	mJ
dv/dt	MOSFET dv/ dt ruggedness VDS = 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	°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	RSF60R070F	Units	Test Conditions
R θ JC	Junction-to-Case	3.2	°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	72		1 cubic foot chamber, free air.

OFF Characteristics T_J= 25°C unless otherwise specified

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
BVDSS	Drain- to- source Breakdown Voltage	600	--	--	V	VGS=0V, ID=1mA
IDSS	Drain- to- Source Leakage Current	--	--	10	μA	VDS=600V, VGS=0V
IGSS	Gate- to- Source Forward Leakage	--	--	100	nA	VGS=20V, VDS=0V
	Gate- to- Source Reverse Leakage	--	--	-100		VGS=-20V, VDS=0V

ON Characteristics T_J=25°C unless otherwise specified

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
RDS(on)	Static Drain- to- Source On-Resistance(Note*2)	--	58	68	mΩ	VGS=10V, ID=24A
VGS(TH)	Gate Threshold Voltage	3	4	5	V	VGS=VDS, ID=1mA

Resistive Switching Characteristics Essentially independent of operating temperature

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
td(ON)	Turn- on Delay Time	--	32	--	nS	VDS=400V ID=24A RG=2.5Ω
trise	Rise Time	--	32	--		
td(OFF)	Turn- OFF Delay Time	--	42	--		
tfall	Fall Time	--	22.5	--		

Dynamic Characteristics Essentially independent of operating temperature

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
Ciss	Input Capacitance	--	3400	--	pF	VGS=0V VDS=100V f=100kHz
Coss	Output Capacitance	--	120	--		
Crss	Reverse Transfer Capacitance	--	4.3	--		
Qg	Total Gate Charge	--	70	--	nC	VDS=480V ID=24A VGS=10V
Qgs	Gate- to- Source Charge	--	22	--		
Qgd	Gate-to-Drain(" Miller") Charge	--	28	--		

Source- Drain Diode Characteristics

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
IS	Continuous Source Current	--	--	48	A	Integral pn- diode in MOSFET
ISM	Maximum Pulsed Current	--	--	144	A	
VSD	Diode Forward Voltage	--	--	1.2	V	IS=48A, VGS=0V
trr	Reverse Recovery Time	--	200	--	nS	VR=300V IS=24A, di/dt=100A /μs
Qrr	Reverse Recovery Charge	--	1.4	--	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

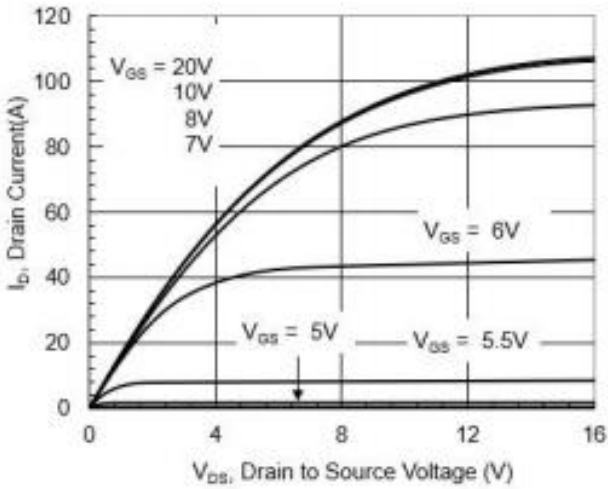


Fig1. Output characteristics $T_J = 25^\circ\text{C}$

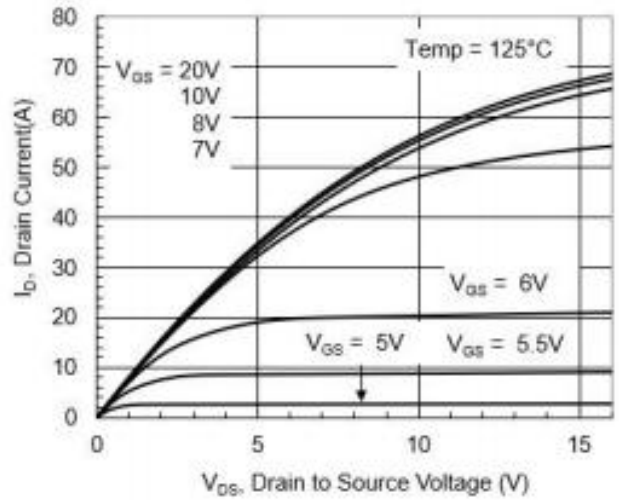


Fig2. Output characteristics $T_J = 125^\circ\text{C}$

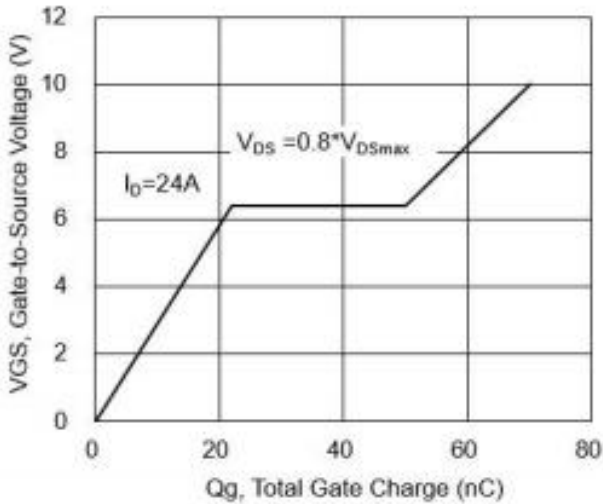


Fig3. Gate charge characteristics

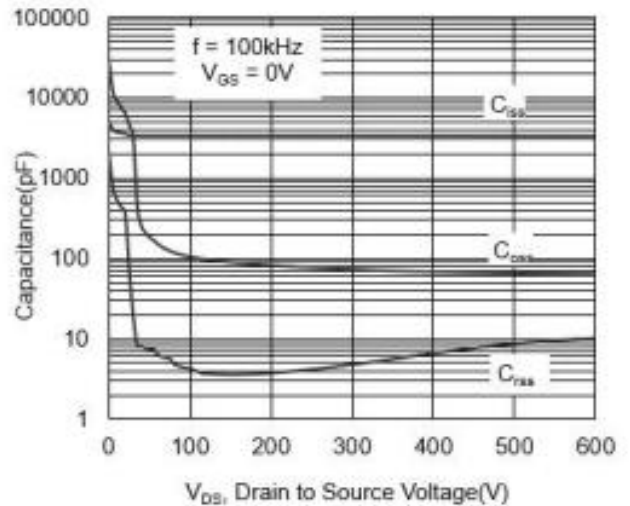


Fig 4. Capacitance Characteristics

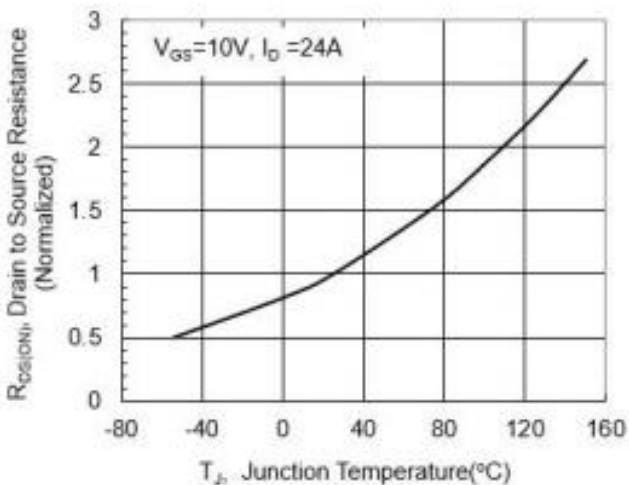


Fig 5. $R_{DS(on)}$ vs junction temperature

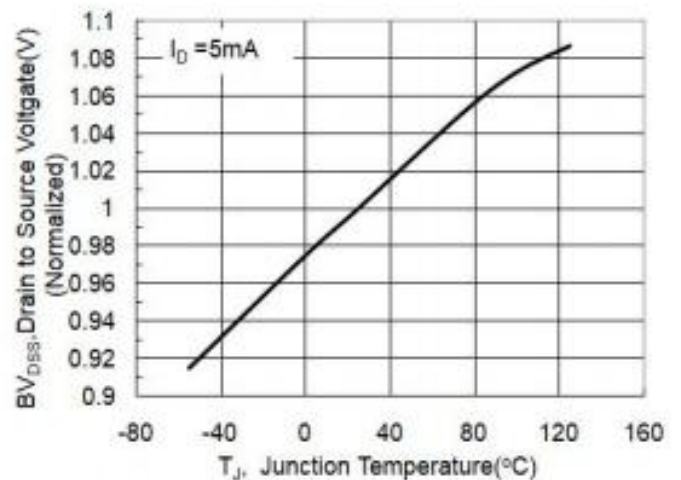


Fig 6. BV_{DSS} vs junction temperature

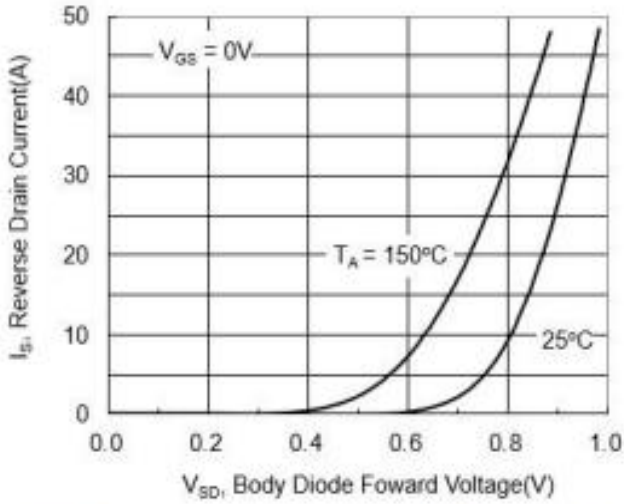


Fig 7 . Forward characteristics of reverse diode

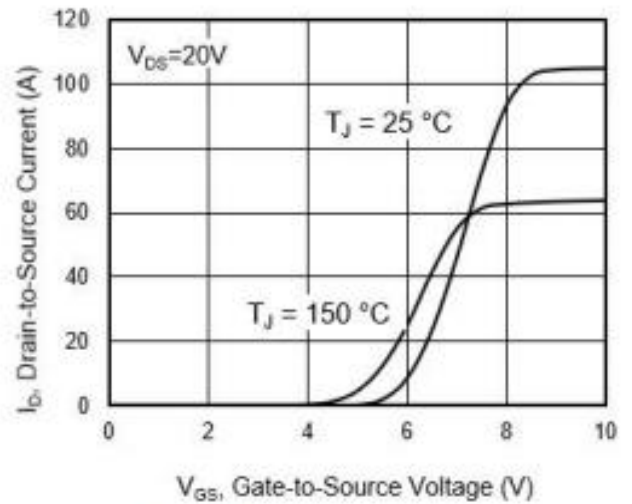


Fig 8 . Transfer characteristics

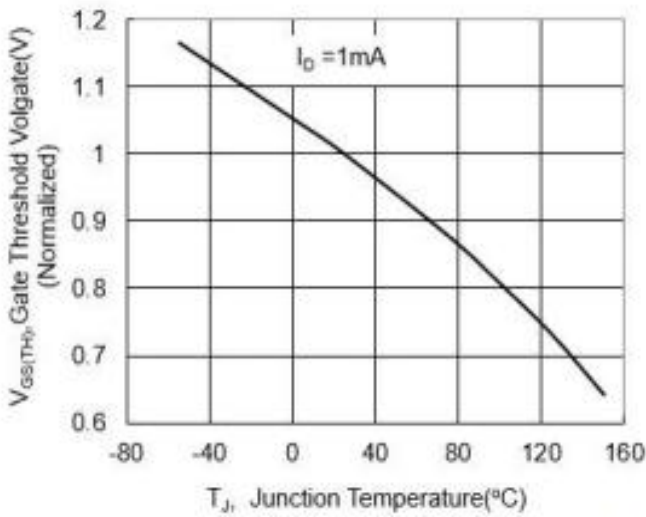


Fig 9 . $V_{GS(TH)}$ vs junction temperature

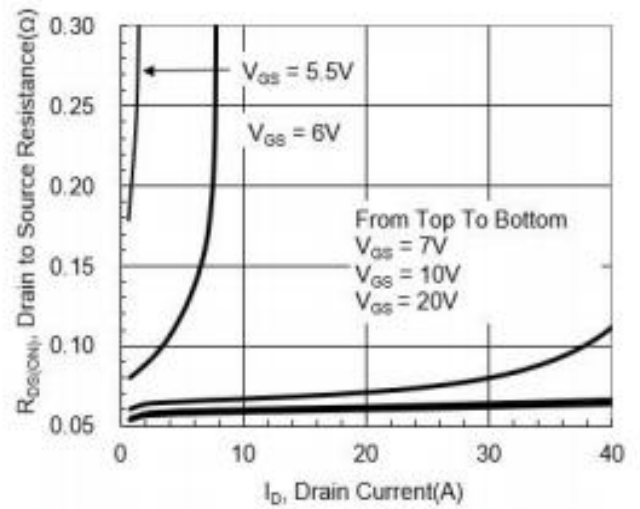


Fig 10. Drain-source on-state resistance $T_J = 25^\circ\text{C}$

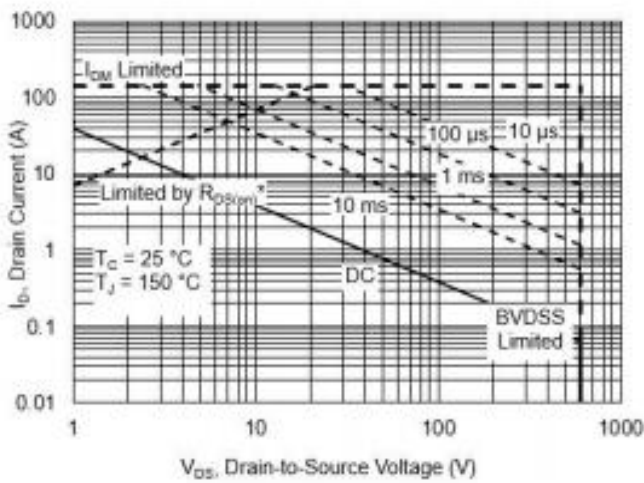


Fig 11. Safe operating area(TO-220F) $T_c = 25^\circ\text{C}$

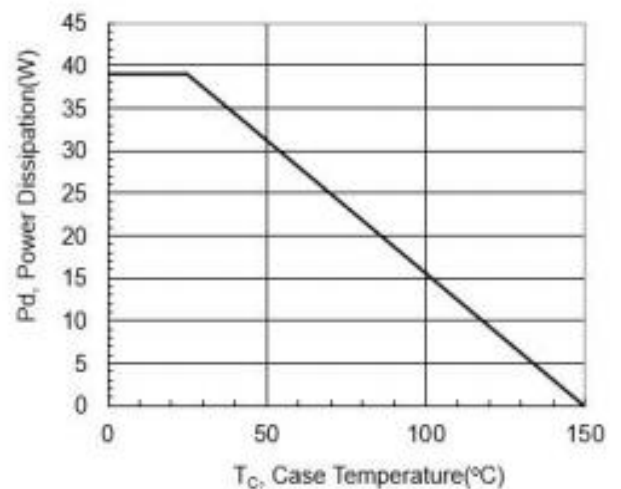


Fig 12 . Power dissipation

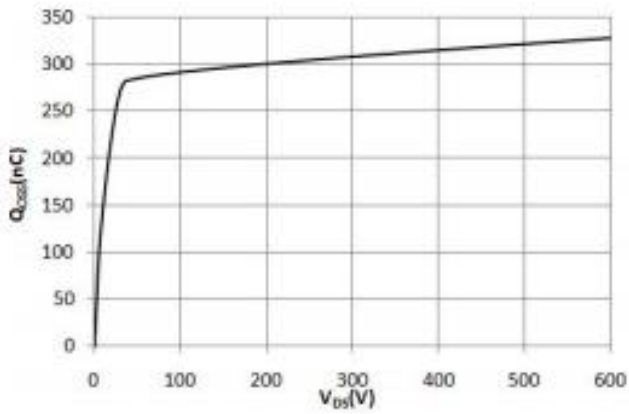


Fig 13 . Qoss vs Drain-Source Voltage

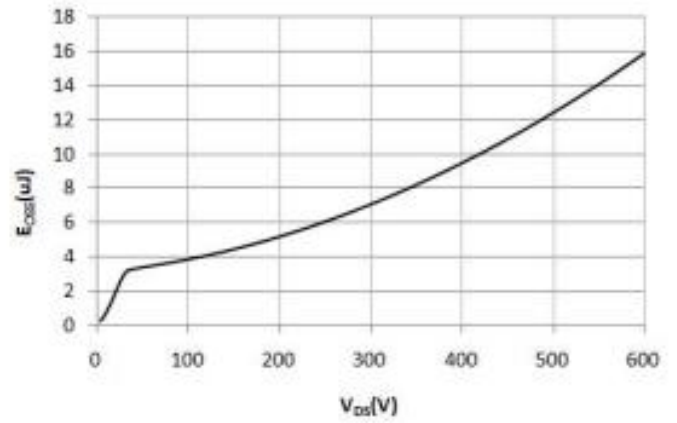


Fig 14 . Eoss vs Drain-Source Voltage

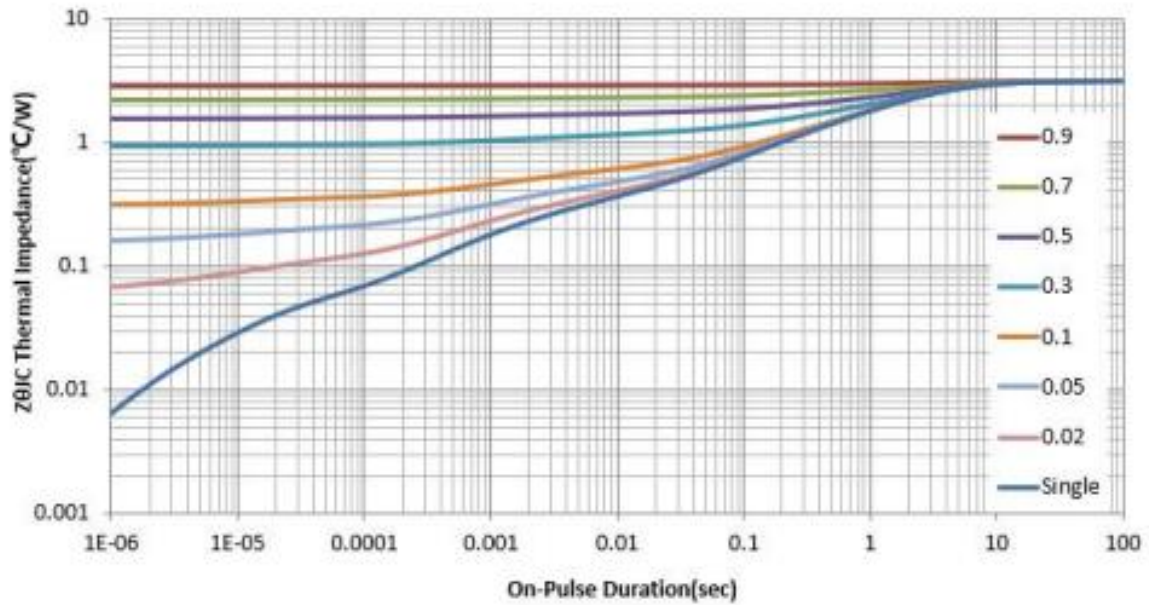


Fig 15. Transient thermal impedance

Test Circuits and Waveforms

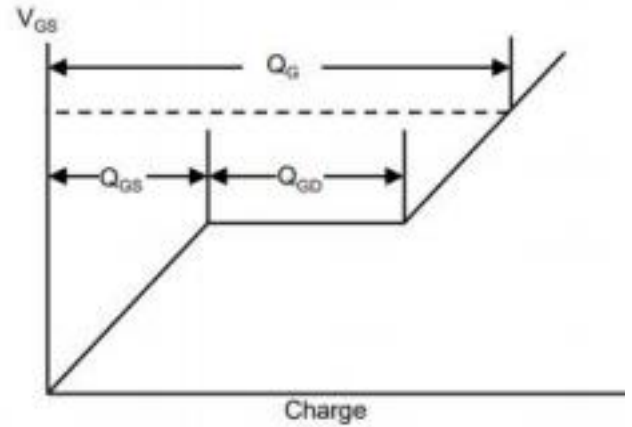
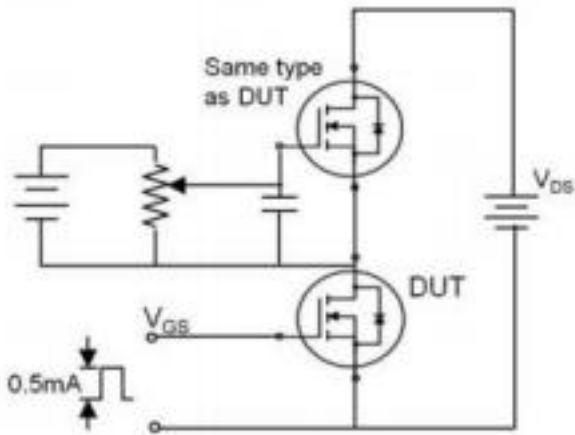


Fig 16. Gate charge test circuit & waveform

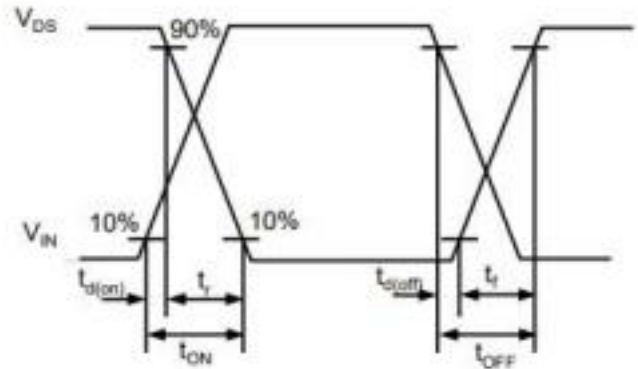
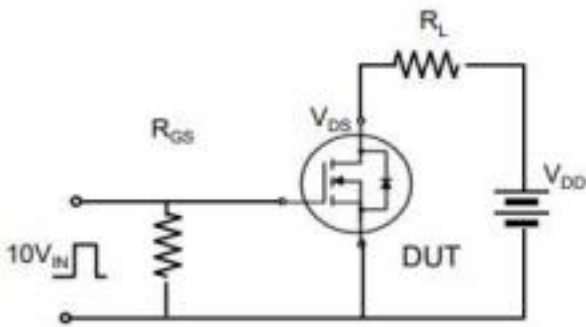


Fig 17. Switching time test circuit & waveform

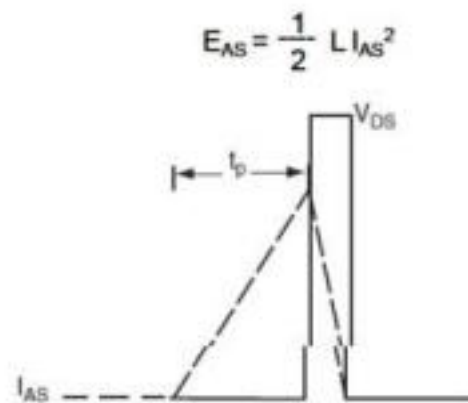
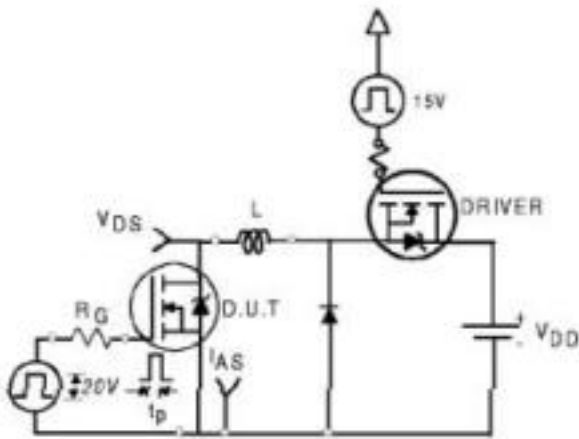
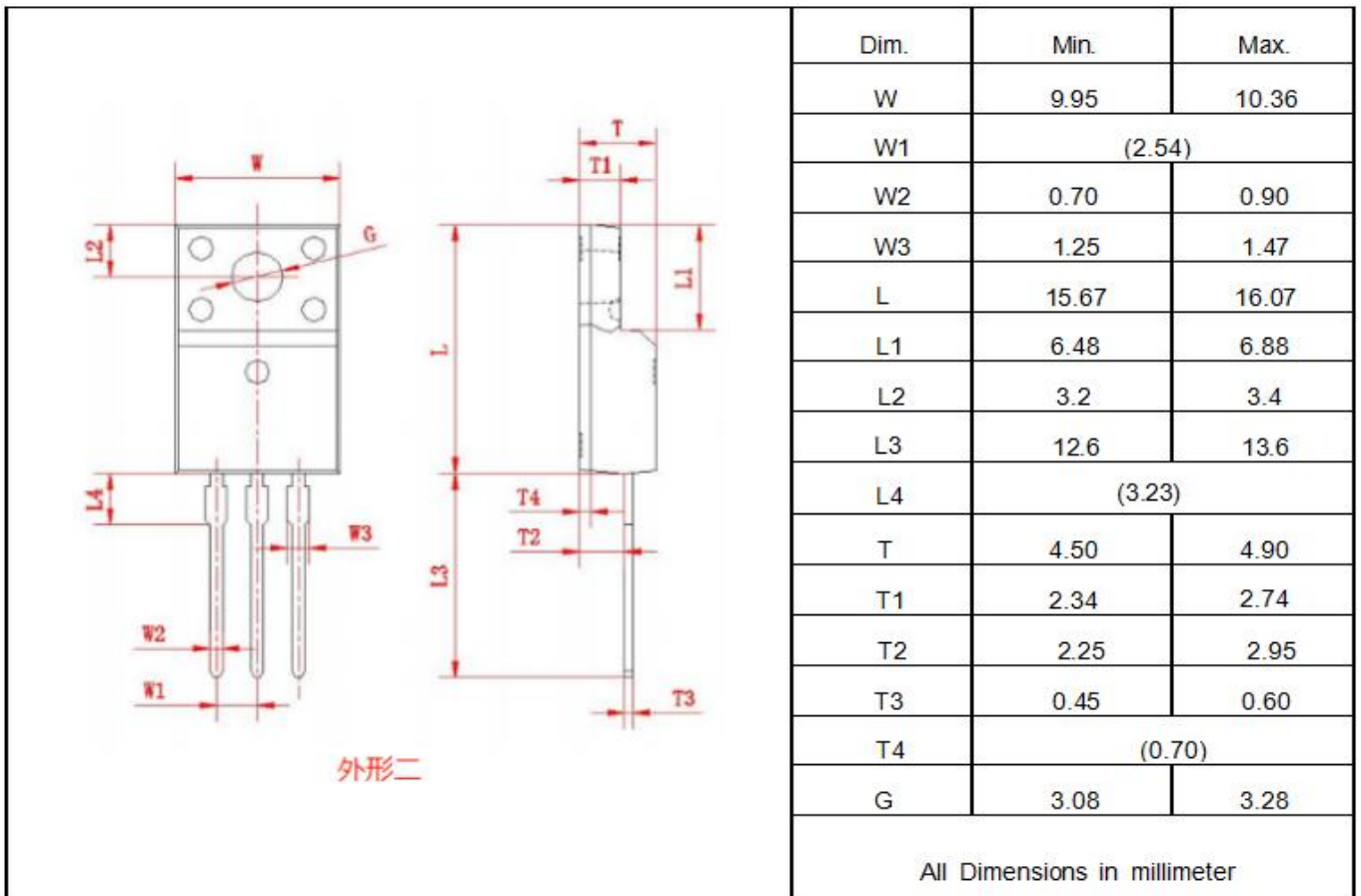
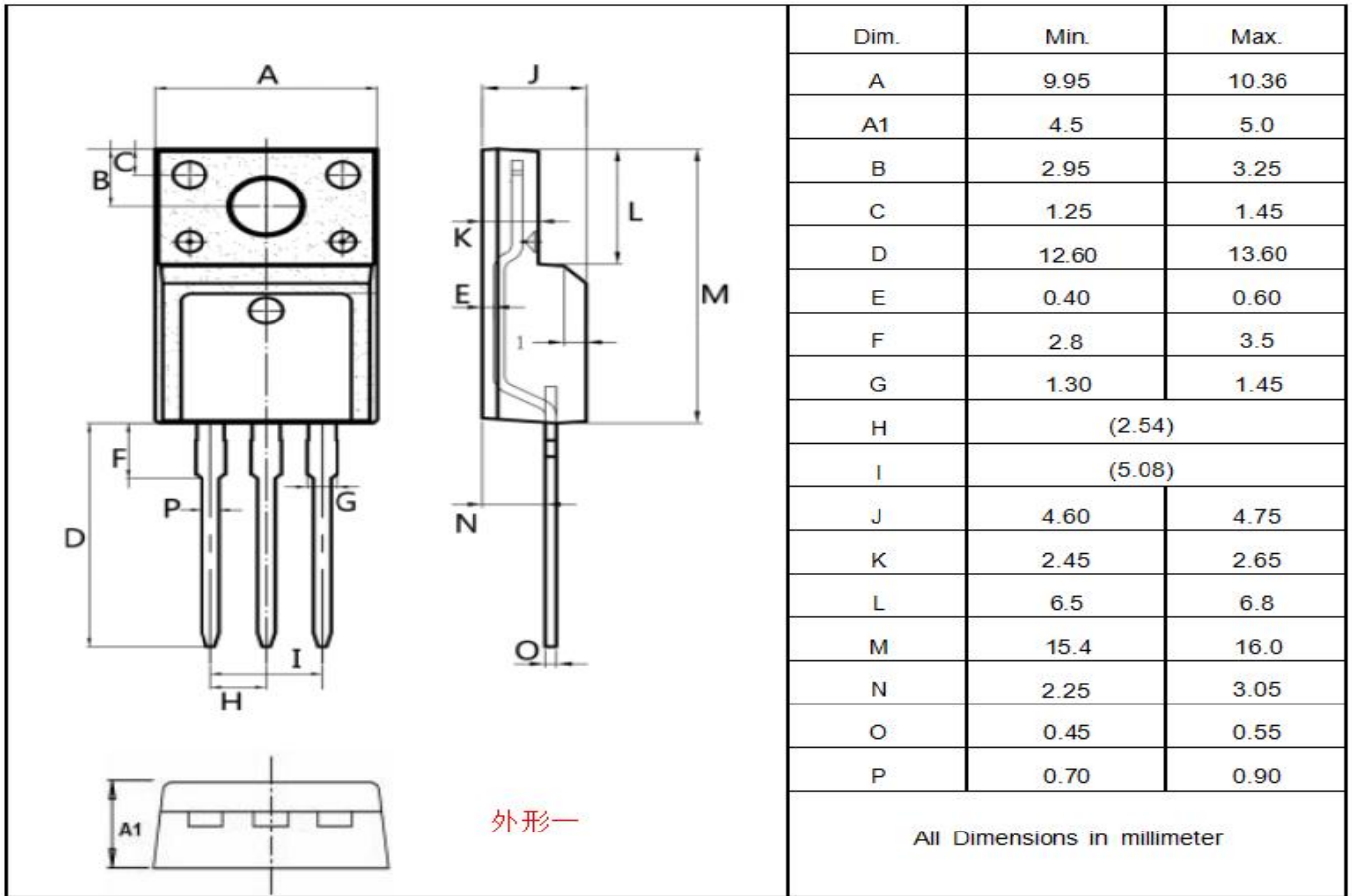


Fig 18. Unclamped Inductive switching test circuit & waveform

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



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