

ID	$R_{DS(ON)}$ (Typ)	VDSS
40A	71m Ω	600V

Applications:

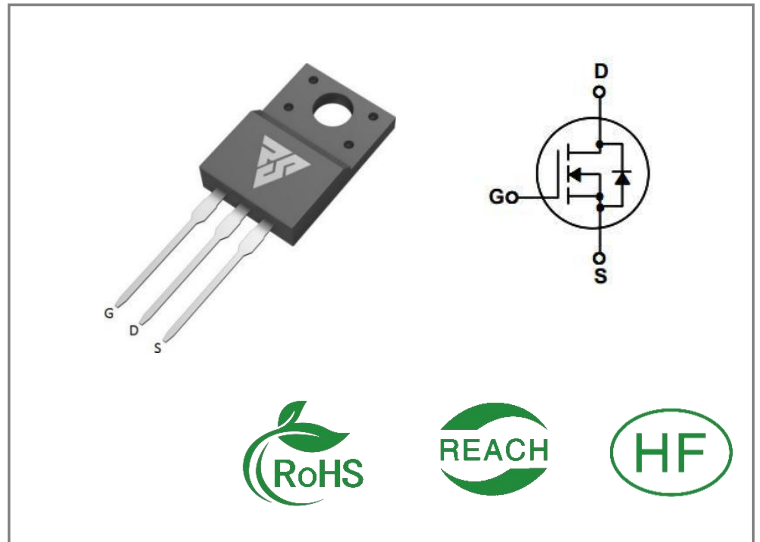
- Switch Mode Power Supply(SMPS)
- Uninterruptible Power Supply (UPS)
- Power Factor Correction (PFC)
- AC-DC Switching Power Supply

Features:

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

Ordering Information

Part Number	Package	Marking	Packing	Qty.
RSF60T090F	T0-220F	RSF60T090F	Tube	50 PCS



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

Symbol	Parameter	RSF60T090F	Units
VDSS	Drain-to-Source Voltage	600	V
ID	Continuous Drain Current $T_C = 25^\circ\text{C}$	40	A
ID	Continuous Drain Current $T_C = 100^\circ\text{C}$	20	
IDM	Pulsed Drain Current (Note*1)	120	
PD	Power Dissipation	50.6	W
VGS	Gate- to- Source Voltage	± 30	V
EAS	Single Pulse Avalanche Energy $V_{DD} = 50\text{V}$, $R_G = 25\ \Omega$, $T_C = 25^\circ\text{C}$	625	mJ
dv/dt	Reverse diode dv/dt $V_{DS} = 0 \dots 480\text{V}$, $T_j = 25^\circ\text{C}$, $I_{SD} \leq I_D$	50	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	RSF60T090F	Units	Test Conditions
R θ JC	Junction-to-Case	2.47	°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	45		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	--	--	10	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)	--	71	90	mΩ	VGS=10V ID=20A
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	--	36	--	nS	VDS=300V ID=40A RG=10Ω
trise	Rise Time	--	75	--		
td(OFF)	Turn- OFF Delay Time	--	68	--		
tfall	Fall Time	--	48	--		

Dynamic Characteristics Essentially independent of operating temperature

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
Ciss	Input Capacitance	--	2898	--	pF	VGS=0V VDS=200V f=100KHz
Coss	Output Capacitance	--	68	--		
Crss	Reverse Transfer Capacitance	--	2.5	--		
Qg	Total Gate Charge	--	56	--	nC	VDS=480V ID=40A VGS=10V
Qgs	Gate- to- Source Charge	--	19	--		
Qgd	Gate-to-Drain(" Miller") Charge	--	23	--		

Source- Drain Diode Characteristics

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
IS	Continuous Source Current	--	--	40	A	Integral pn- diode in MOSFET
ISM	Maximum Pulsed Current	--	--	120	A	
VSD	Diode Forward Voltage	--	--	1.4	V	IS=40A,VGS=0V
trr	Reverse Recovery Time	--	190	--	nS	VGS=0V IS=40A di/dt=100A/μs
Qrr	Reverse Recovery Charge	--	1.6	--	μC	

Notes:

* 1. Repetitive rating, pulse width limited by maximum junction temperature.

* 2. Pulse Test: Pulse width ≤ 300μs, Duty Cycle ≤ 2%

Typical Feature Curve

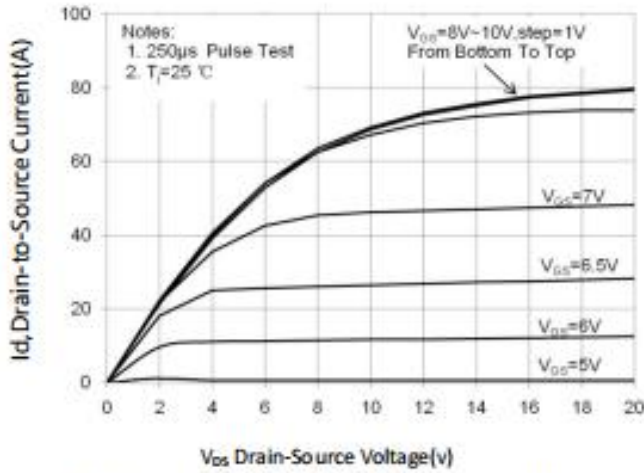


Figure1. Typical Output Characteristics

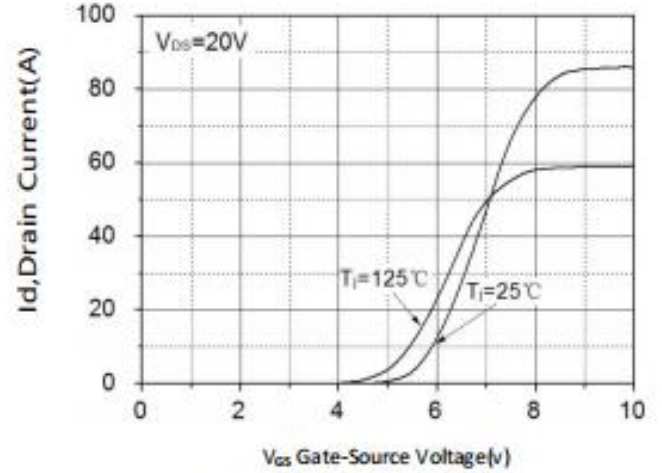


Figure2. Typical Transfer Characteristics

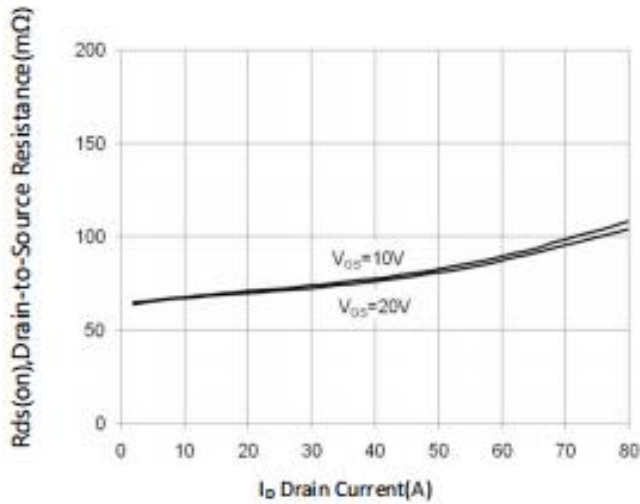


Figure3. On-Resistance versus Drain Current

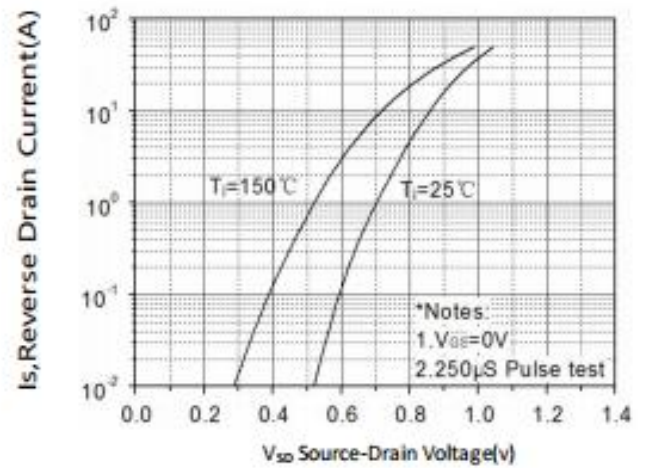


Figure4. Diode forward voltage versus Current

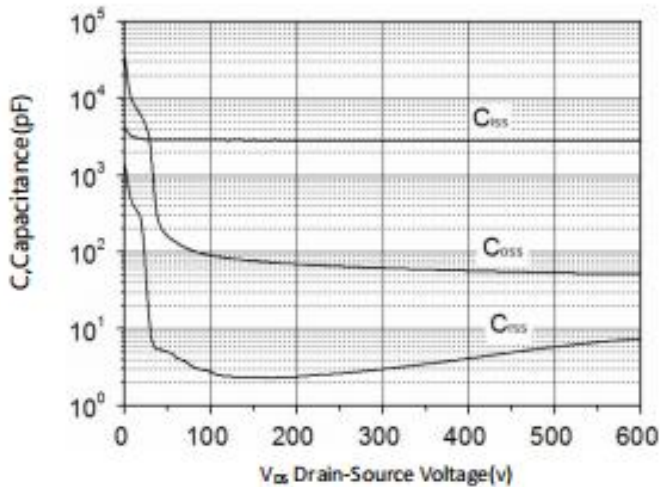


Figure5. Typical Capacitance versus V_{DS}

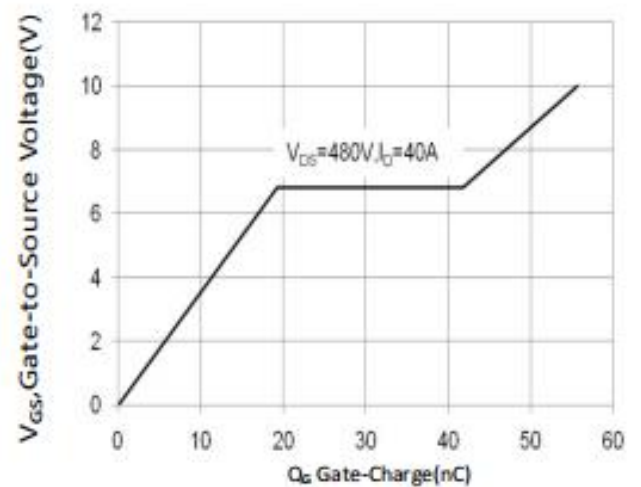


Figure6. Typical Gate Charge versus V_{GS}

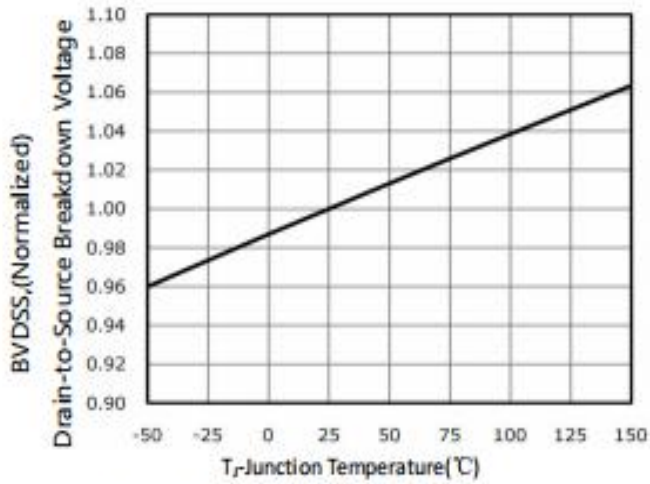


Figure7. BV_{DSS} Variation with Temperature

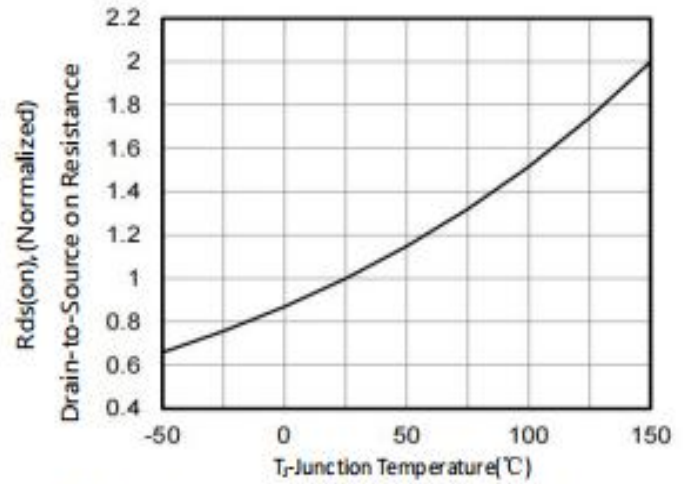
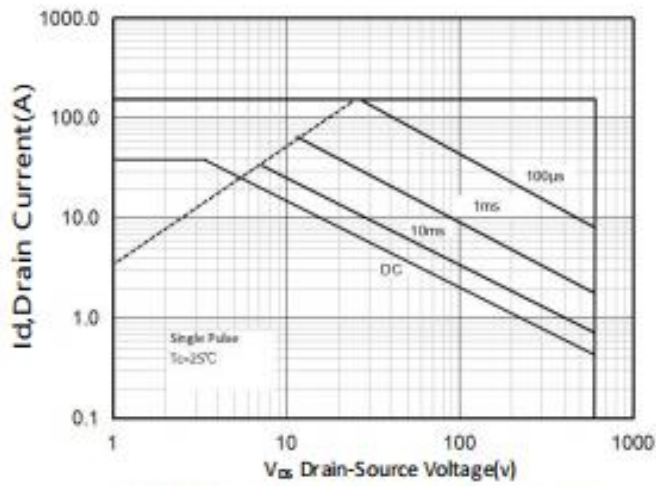
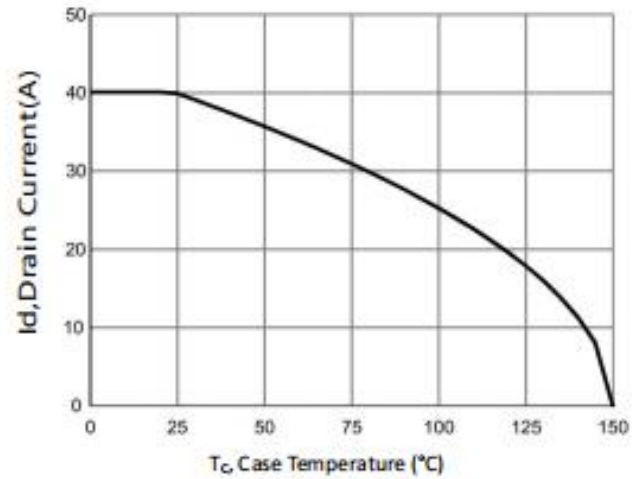


Figure8. On-Resistance Variation with Temperature

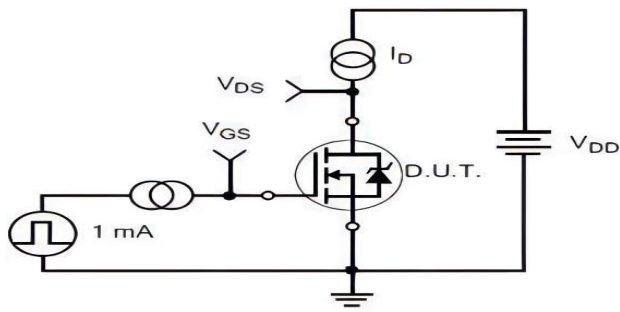


**Figure9. Maximum Safe Operating Area
TO-220F**

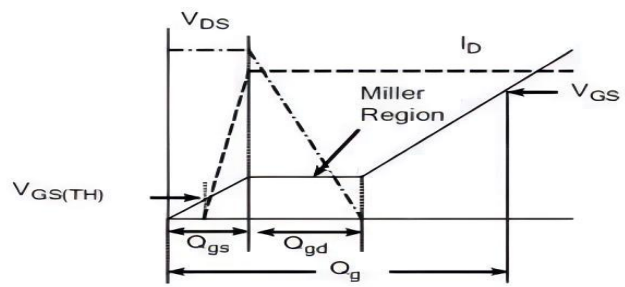


**Figure10. Maximum Continuous Drain Current
versus Case Temperature**

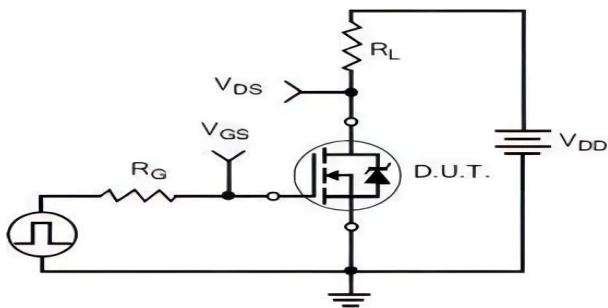
Test Circuits and Waveforms



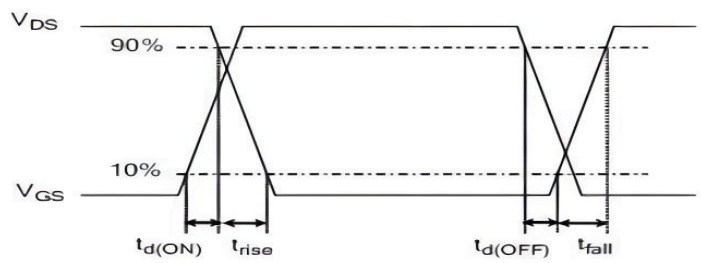
Gate Charge Test Circuit



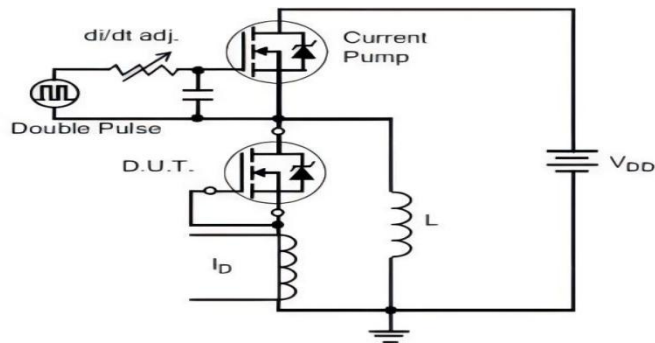
Gate Charge Waveform



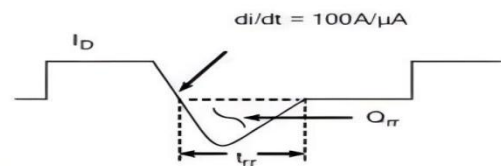
Resistive Switching Test Circuit



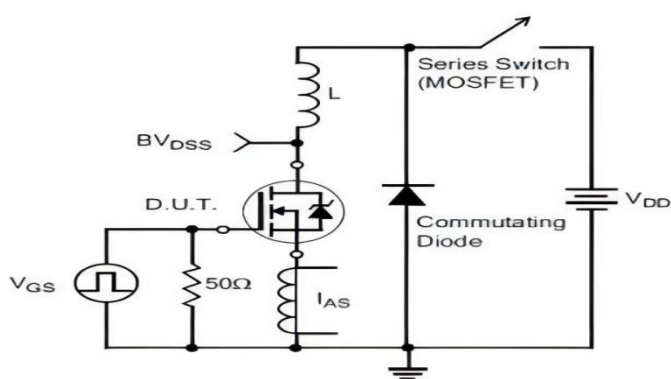
Resistive Switching Waveforms



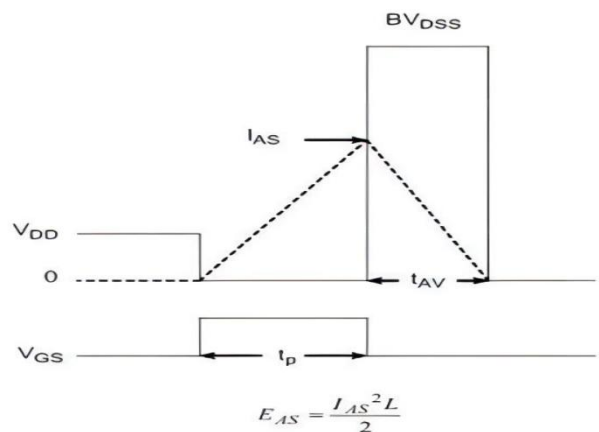
Diode Reverse Recovery Test Circuit



Diode Reverse Recovery Waveform



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

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

外形一

Dim.	Min.	Max.
A	9.95	10.36
A1	4.5	5.0
B	2.95	3.25
C	1.25	1.45
D	12.60	13.60
E	0.40	0.60
F	2.8	3.5
G	1.30	1.45
H	(2.54)	
I	(5.08)	
J	4.60	4.75
K	2.45	2.65
L	6.5	6.8
M	15.4	16.0
N	2.25	3.05
O	0.45	0.55
P	0.70	0.90

All Dimensions in millimeter

外形二

Dim.	Min.	Max.
W	9.95	10.36
W1	(2.54)	
W2	0.70	0.90
W3	1.25	1.47
L	15.67	16.07
L1	6.48	6.88
L2	3.2	3.4
L3	12.6	13.6
L4	(3.23)	
T	4.50	4.90
T1	2.34	2.74
T2	2.25	2.95
T3	0.45	0.60
T4	(0.70)	
G	3.08	3.28

All Dimensions in millimeter

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