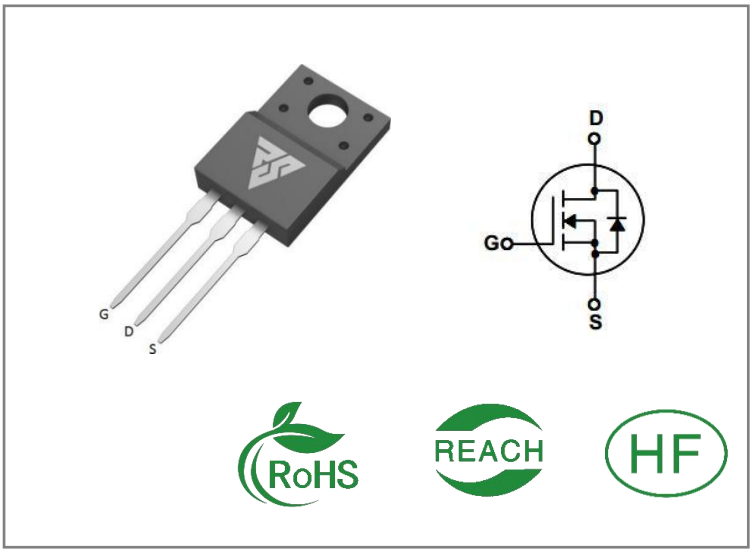
ID	R_{DS}(ON)(Typ)	VDSS
23A	120mΩ	500V



Applications:

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

Features:

- Low gate charge
- Low RDS(on) per chip area(Low FOM)
- Very low switching and conduction loss
- Extremely high commutation ruggedness
- Ultra fast body diode

Ordering Information

Part Number	Package	Marking	Packing	Qty.
RSF50R140F	T0-220F	RSF50R140F	Tube	50 PCS

Absolute Maximun Ratings Tc= 2 5℃ unless otherwise specified

Symbol	Parameter	RSF50R140F	Units
VDSS	Drain-to-Source Voltage	500	V
ID	Continuous Drain Current TC=25℃	23	A
ID	Continuous Drain Current TC=100℃	14.8	
IDM	Pulsed Drain Current TP=100uS	69	
PD	Power Dissipation	123	W
VGS	Gate- to- Source Voltage	±30	V
EAS	Single Pulse Avalanche Engergy L=10mH,VDS=100V,TJ=25℃	500	mJ
dv/dt	MOSFET dv/dt ruggedness VDS = 0...400V	50	V/ns
dv/dt	Reverse diode dv/dt VDS = 0...400V Tj = 25℃, ISD≤ID	15	
TL TPKG	Maximum Temperature for Soldering	300	℃
	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	RSF50R140F	Units	Test Conditions
RθJC	Junction-to-Case	1.01	℃/ W	Drain lead soldered to water cooled heatsink, PD adjusted for a peak junction temperature of + 1 5 0 ℃
RθJA	Junction-to- Ambient	41.18		1 cubic foot chamber,free air.

OFF Characteristics TJ= 25℃ unless otherwise specified

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
BVDSS	Drain- to- source Breakdown Voltage	500	--	--	V	VGS=0V ID=250μA
IDSS	Drain- to- Source Leakage Current	--	--	5	μA	VDS=500V 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℃ unless otherwise specified

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
RDS(on)	Static Drain- to- Source On-Resistance	--	120	140	mΩ	VGS=10V ID=6.9A
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	--	22	--	nS	VDS=400V ID=13A RG=15Ω VGS=10V
trise	Rise Time	--	26	--		
td(OFF)	Turn- OFF Delay Time	--	48	--		
tfall	Fall Time	--	16	--		

Dynamic Characteristics Essentially independent of operating temperature

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
Ciss	Input Capacitance	--	1370	--	pF	VGS=0V VDS=50V f=1.0MHz
Coss	Output Capacitance	--	56	--		
Crss	Reverse Transfer Capacitance	--	1.13	--		
RG	Gate Resistance	--	6.8	--	Ω	VDS=0V VGS=0V f=1.0MHz
Qg	Total Gate Charge	--	33	--	nC	VDS=400V ID=13A VGS=10V
Qgs	Gate- to- Source Charge	--	8.3	--		
Qgd	Gate-to-Drain(" Miller") Charge	--	14	--		

Source- Drain Diode Characteristics

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
IS	Continuous Source Current	--	--	20	A	Integral pn- diode in MOSFET
ISM	Maximum Pulsed Current	--	--	80	A	
VSD	Diode Forward Voltage	--	--	1.0	V	IS=25A VGS=0V
trr	Reverse Recovery Time	--	125	--	nS	VR=300V IS=13A di/dt=100A/μs
Qrr	Reverse Recovery Charge	--	0.91	--	μC	
Irr	Peak Reverse Recovery Current	--	14	--	A	

Notes:

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

Typical Feature Curve

Figure 1. Output Characteristics

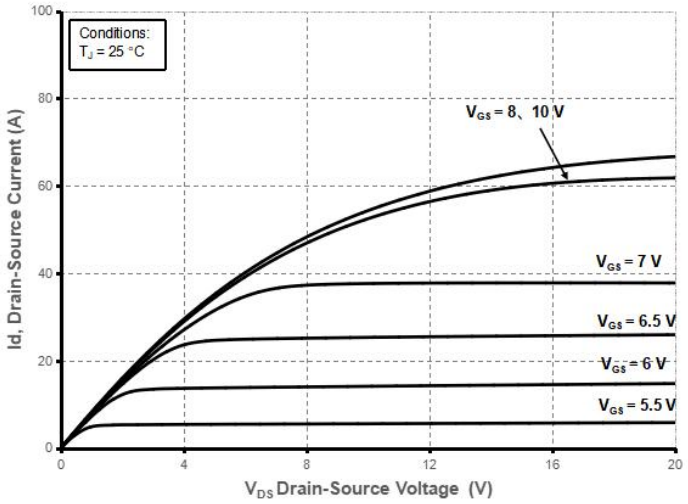


Figure 2. Transfer Characteristics

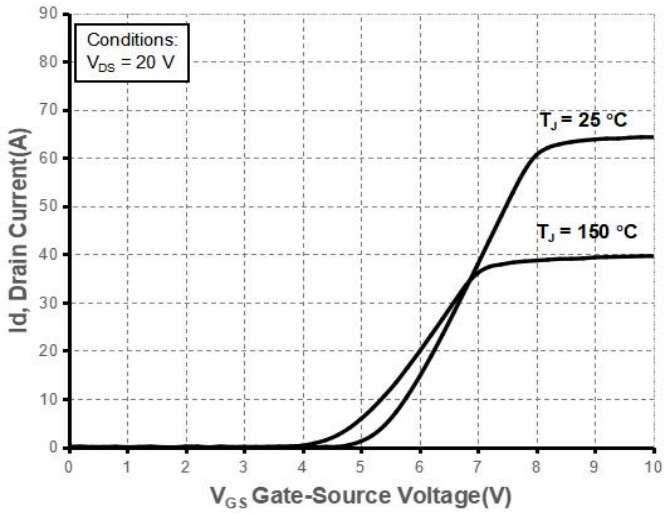


Figure 3. On-state Resistance

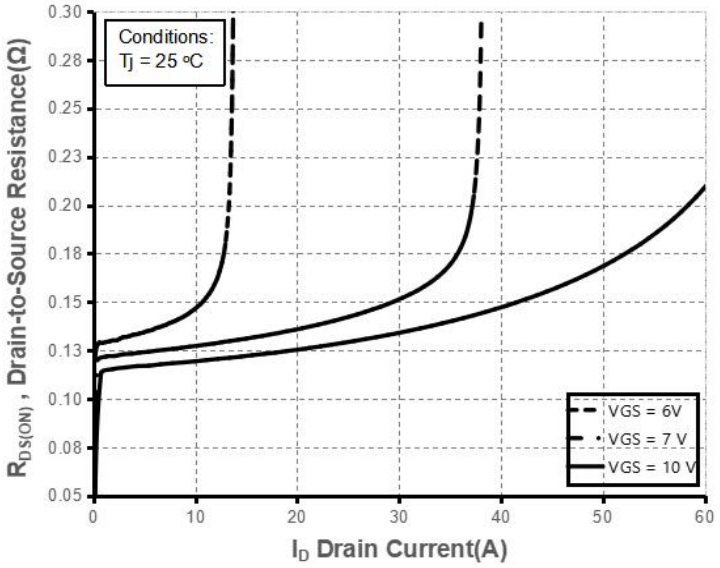


Fig 4. On-state Resistance with Temperature

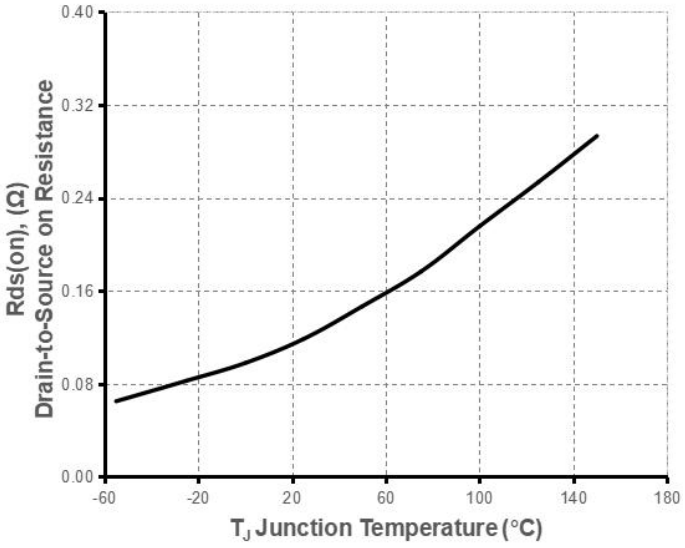


Figure 5. Capacitance

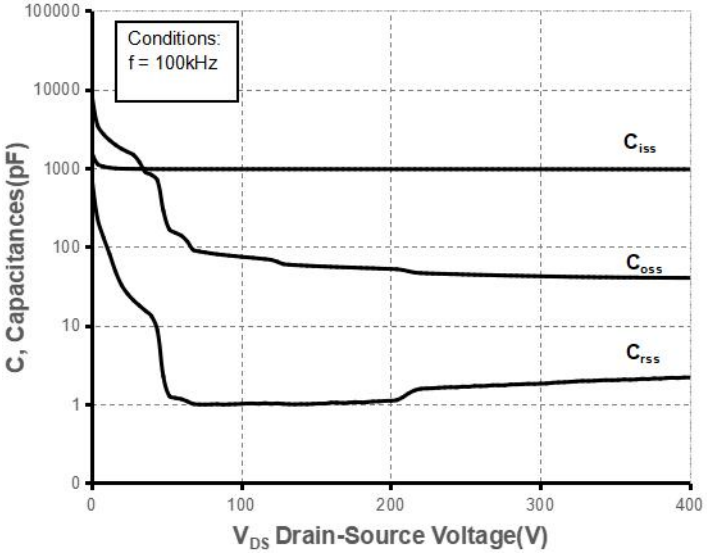


Figure 6. Gate Charge

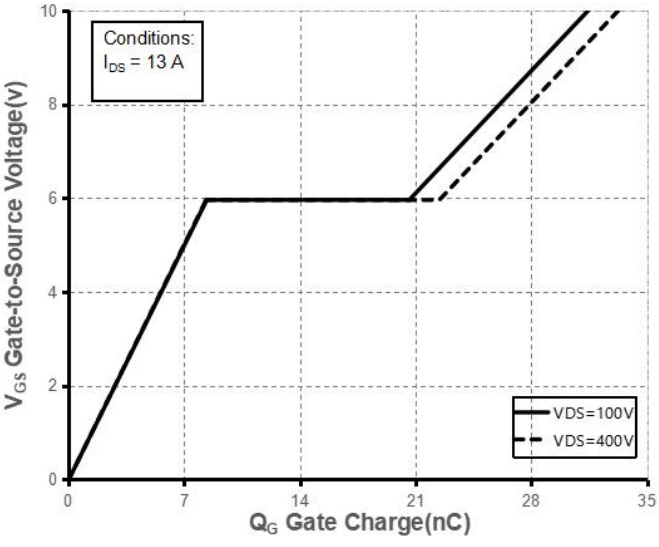


Figure 7. Forward characteristics of reverse diode

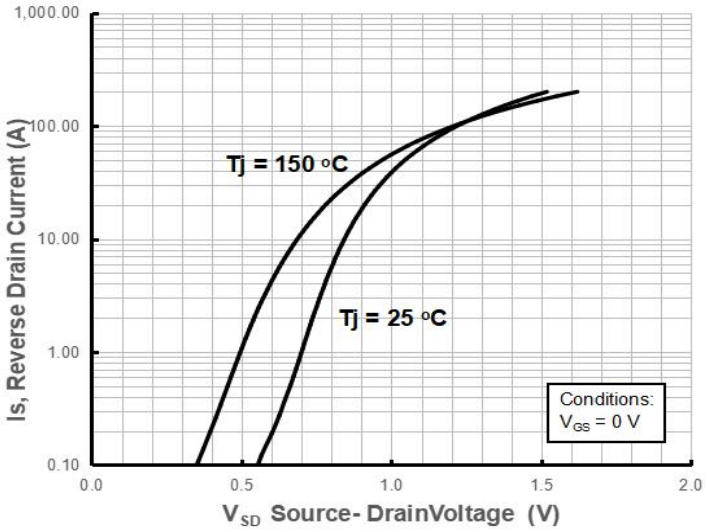


Figure 8. Power Dissipation Derating Curve

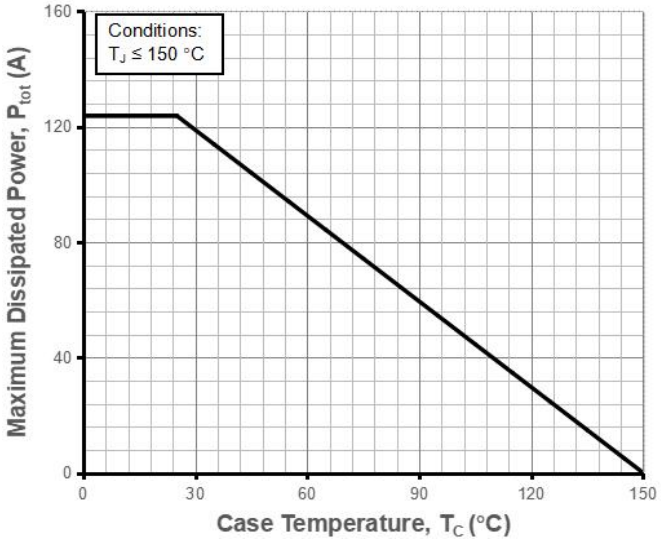


Figure 9. Breakdown Voltage with Temperature

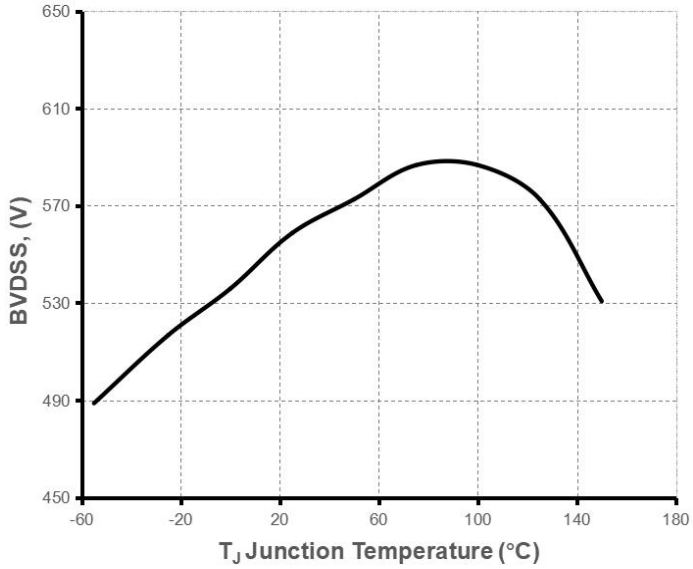


Figure 10. Normalized Threshold Voltage vs. Temperature

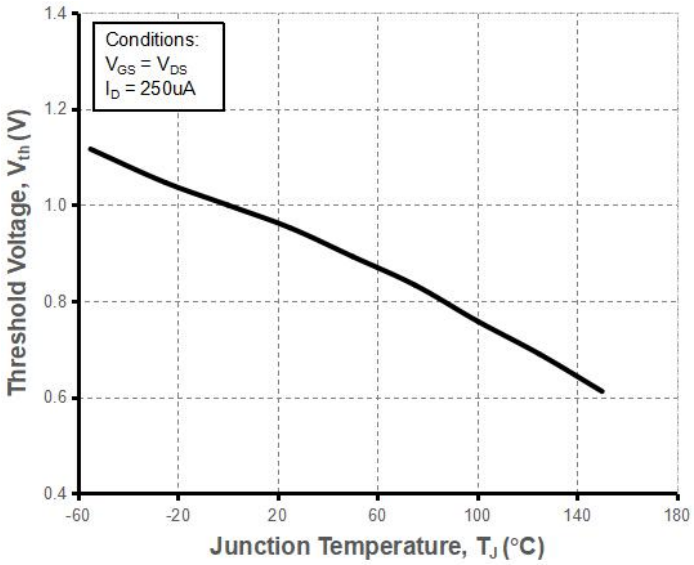


Figure 11. Coss Capacitor Stored Energy

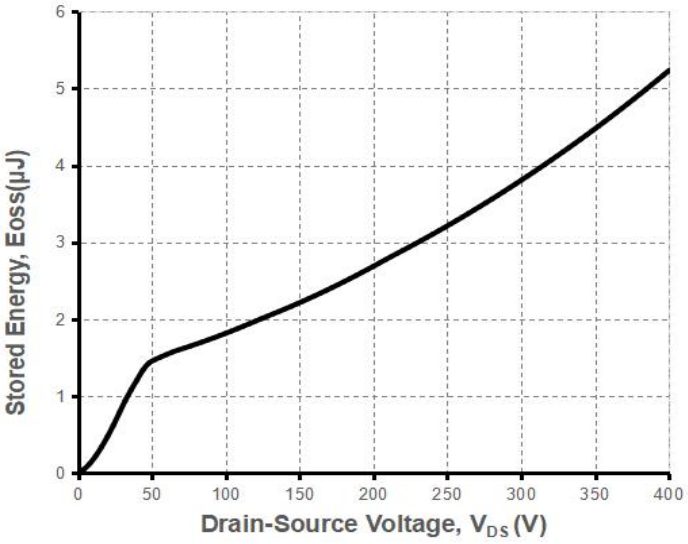


Figure 12. Maximum Drain Current

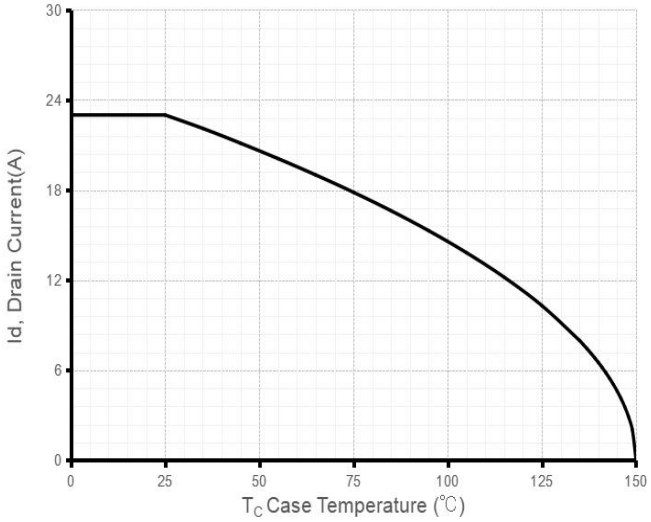


Figure 13. Safe Operating Area

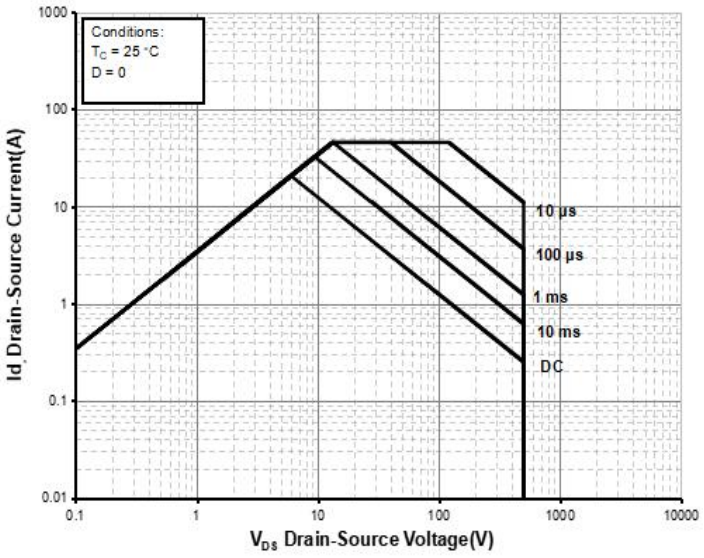
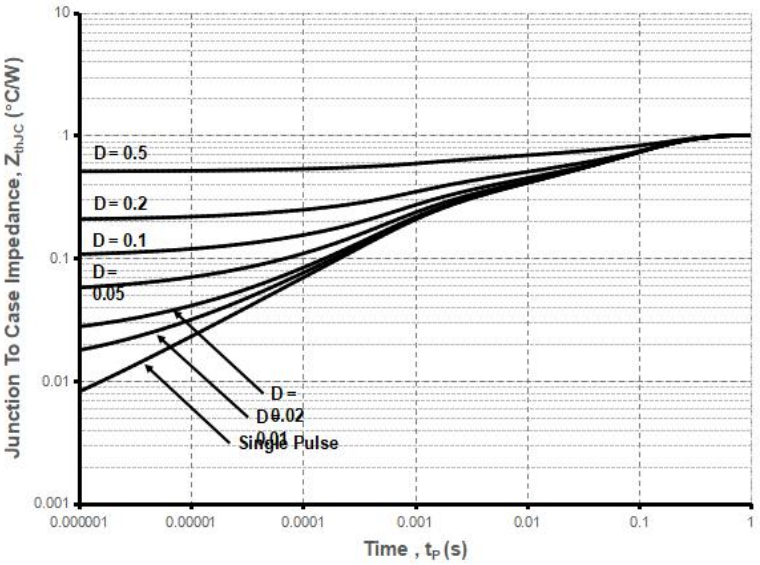


Figure 14. Maximum Transient Thermal Characteristics



Test Circuits and Waveforms

Figure A: Gate Charge Test Circuit and Waveform

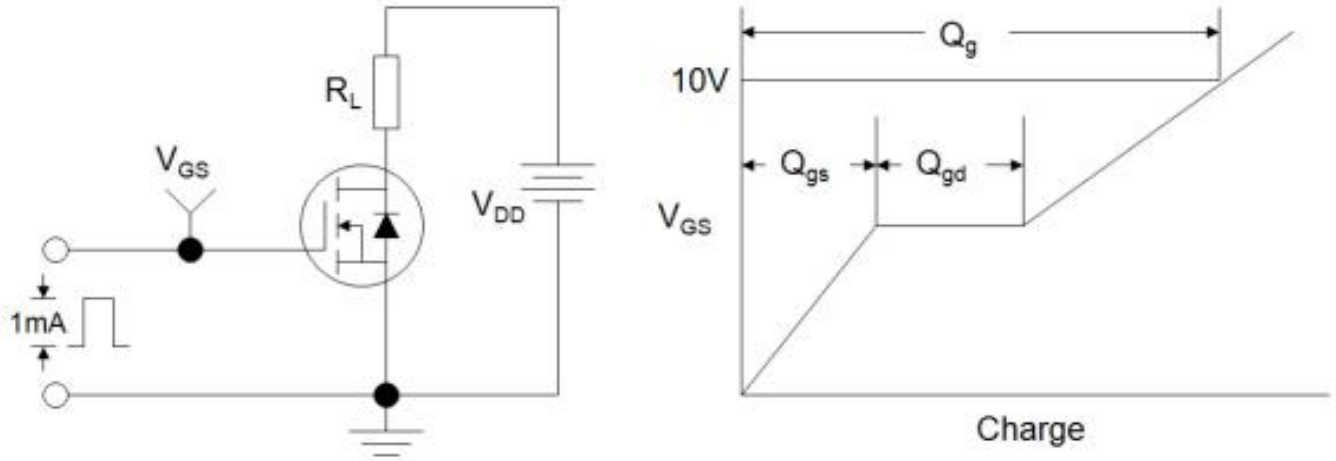


Figure B: Resistive Switching Test Circuit and Waveform

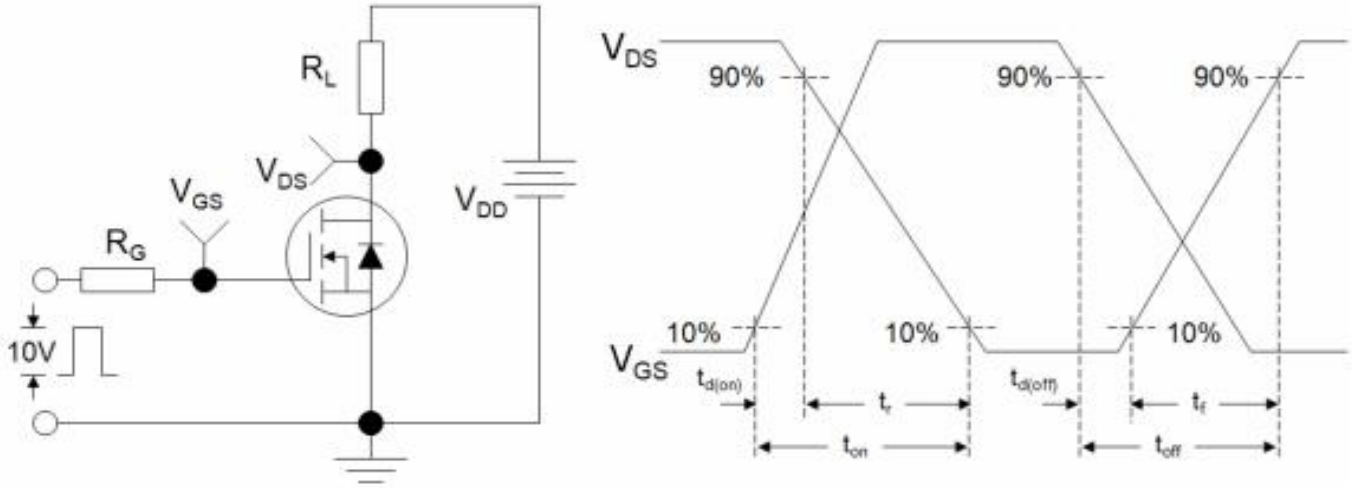
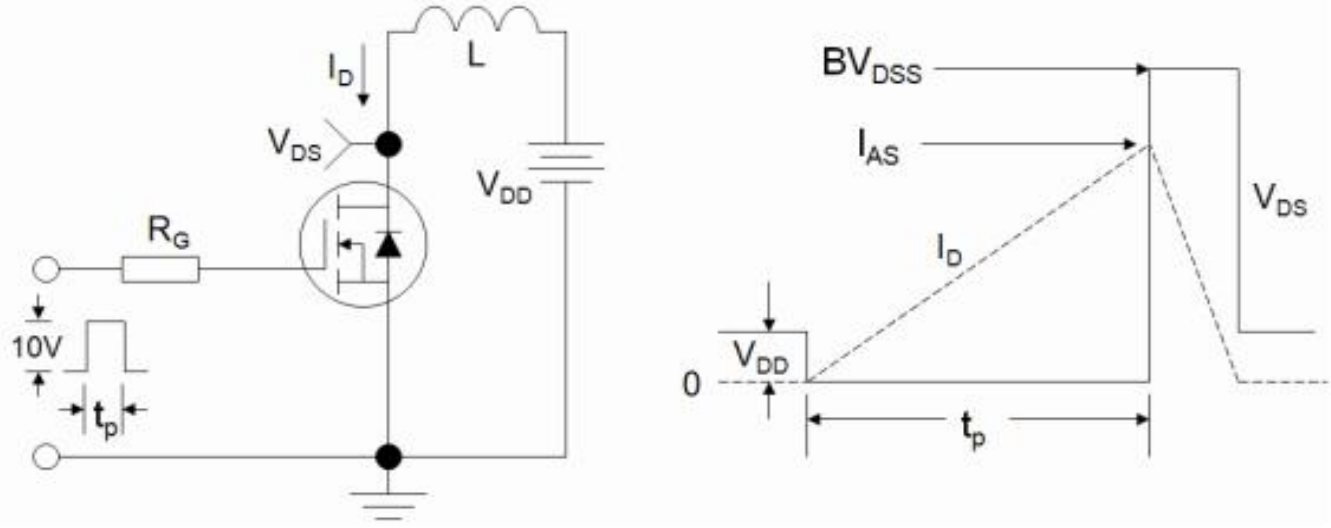
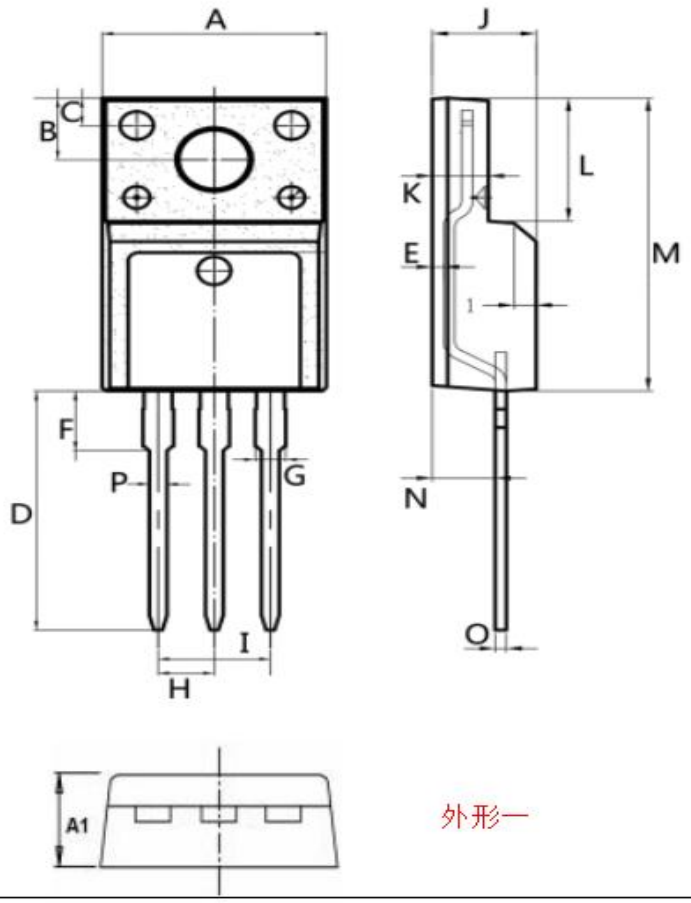


Figure C: Unclamped Inductive Switching Test Circuit and Waveform



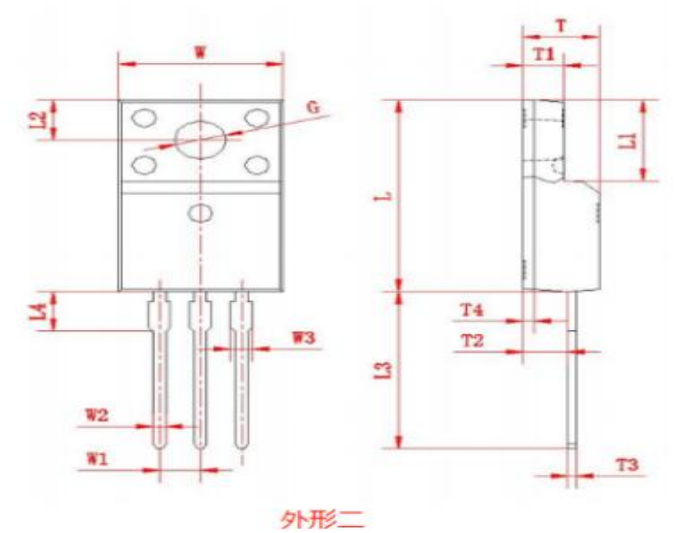
Package outline drawing(TO-220F Unit: mm)



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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