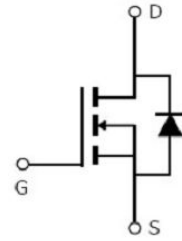


Main Product Characteristics:

V_{DSS}	900V
$R_{DS(on)}$	0.85Ω(typ.)
I_D	10A ^①


TO-3P

Marking and pin Assignment

Schematic diagram
Features and Benefits:

- Advanced MOSFET process technology
- Low On Resistance
- Low Gate Charge
- Fast switching and reverse body recovery


Description:

It utilizes the latest processing techniques to achieve the high cell density and reduces the on-resistance with high repetitive avalanche rating. These features combine to make this design an extremely efficient and reliable device for use in power switching application and a wide variety of other applications.

Absolute max Rating:

Symbol	Parameter	Max.	Units
$I_D @ TC = 25^\circ C$	Continuous Drain Current, $V_{GS} @ 10V$ ①	10	A
$I_D @ TC = 100^\circ C$	Continuous Drain Current, $V_{GS} @ 10V$ ①	7	
I_{DM}	Pulsed Drain Current ②	40	
$P_D @ TC = 25^\circ C$	Power Dissipation ③	170	W
	Linear Derating Factor	1.36	W/°C
V_{DS}	Drain-Source Voltage	900	V
V_{GS}	Gate-to-Source Voltage	± 30	V
E_{AS}	Single Pulse Avalanche Energy @ L=20mH	300	mJ
I_{AS}	Avalanche Current @ L=20mH	5.5	A
T_J T_{STG}	Operating Junction and Storage Temperature Range	-55 to +150	°C

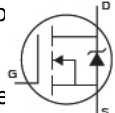
Thermal Resistance

Symbol	Characterizes	Typ.	Max.	Units
R _{θJC}	Junction-to-case ③	—	0.73	°C/W
R _{θJA}	Junction-to-ambient (t ≤ 10s) ④	—	40	°C/W

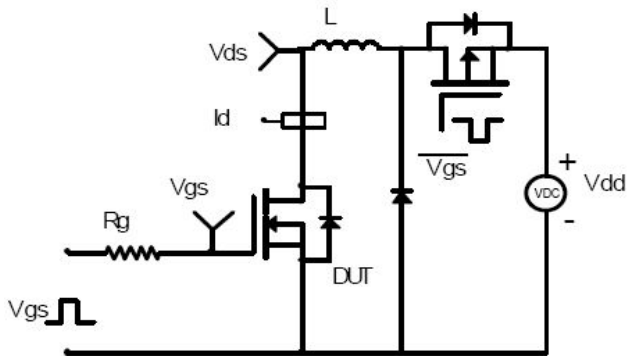
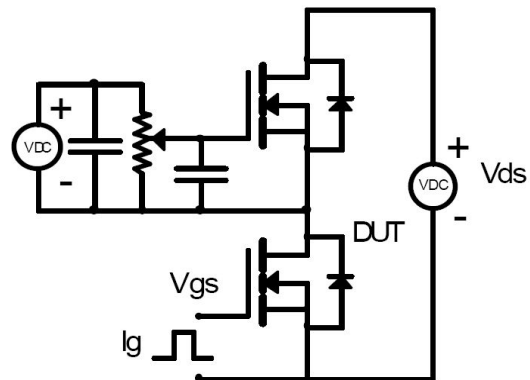
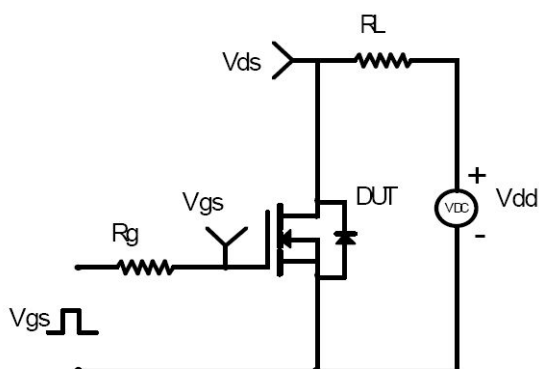
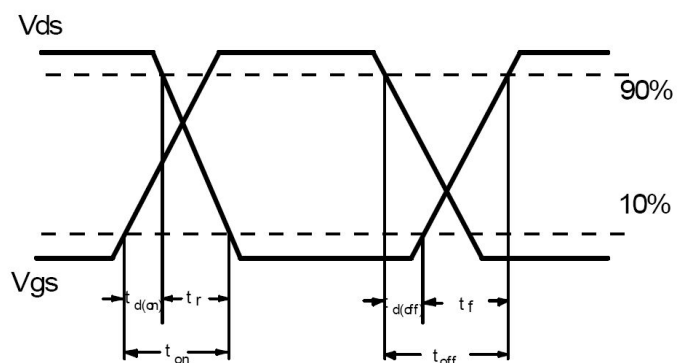
Electrical Characterizes @T_A=25°C unless otherwise specified

Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
V _{(BR)DSS}	Drain-to-Source breakdown voltage	900	—	—	V	V _{GS} = 0V, I _D = 250μA
R _{DS(on)}	Static Drain-to-Source on-resistance	—	0.85	1.3	Ω	V _{GS} =10V, I _D = 4.5A
V _{GS(th)}	Gate threshold voltage	2	—	4	V	V _{DS} = V _{GS} , I _D = 250μA
I _{DSS}	Drain-to-Source leakage current	—	—	1	μA	V _{DS} = 900V, V _{GS} = 0V T _J = 125°C
		—	—	500		
I _{GSS}	Gate-to-Source forward leakage	—	—	100	nA	V _{GS} = 30V
		—	—	-100		V _{GS} = -30V
Q _g	Total gate charge	—	66	—	nC	I _D = 10A, V _{DS} =450V, V _{GS} = 10V
Q _{gs}	Gate-to-Source charge	—	13	—		
Q _{gd}	Gate-to-Drain("Miller") charge	—	25	—		
t _{d(on)}	Turn-on delay time	—	18	—	nS	V _{GS} =10V, V _{DS} =450V, R _L =45Ω, R _{GEN} =4.7Ω I _D =10A
t _r	Rise time	—	28	—		
t _{d(off)}	Turn-Off delay time	—	49	—		
t _f	Fall time	—	34	—		
C _{iss}	Input capacitance	—	2956	—	pF	V _{GS} = 0V V _{DS} = 25V f = 1MHz
C _{oss}	Output capacitance	—	106	—		
C _{rss}	Reverse transfer capacitance	—	18	—		

Source-Drain Ratings and Characteristics

Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
I _S	Continuous Source Current (Body Diode)	—	—	10 ①	A	MOSFET symb showing the integral reverse p-n junction diode. 
I _{SM}	Pulsed Source Current (Body Diode)	—	—	40	A	
V _{SD}	Diode Forward Voltage	—	—	1.5	V	I _S =10A, V _{GS} =0V
t _{rr}	Reverse Recovery Time	—	265	—	nS	T _J = 25 °C, I _F = 10A, di/dt =
Q _{rr}	Reverse Recovery Charge	—	1.7	—	nC	100A/μs

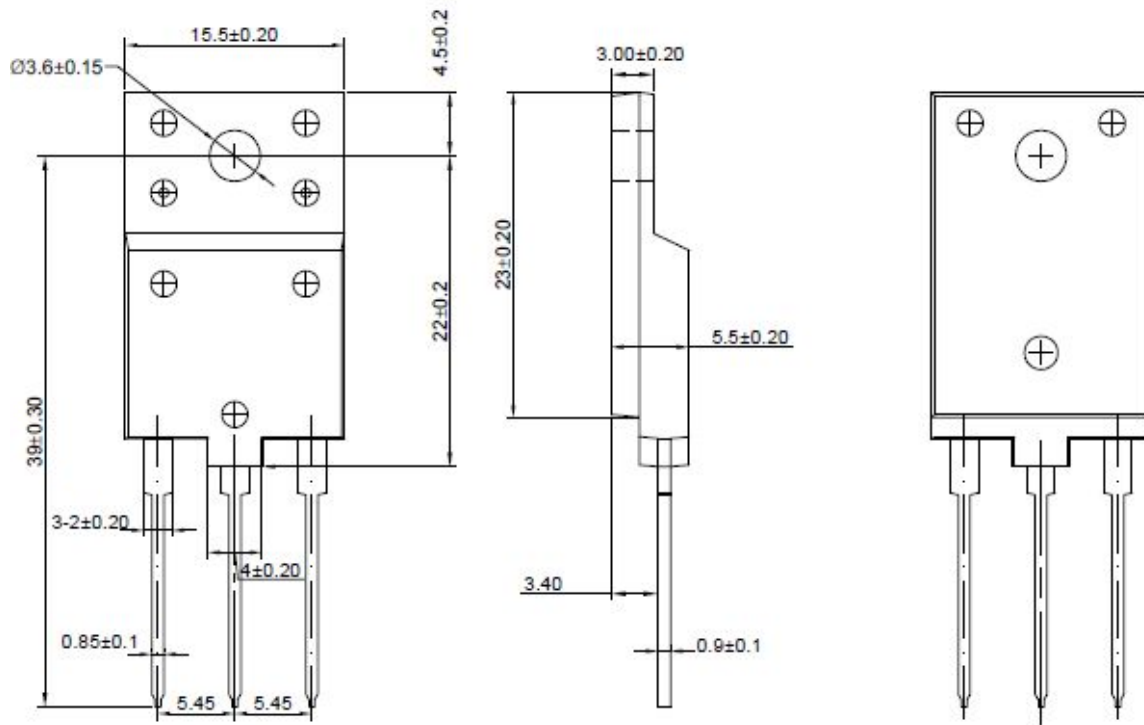
Test circuits and Waveforms

EAS Test Circuit:

Gate charge test circuit:

Switching Time Test Circuit:

Switching Waveforms:


Notes:

- ① Calculated continuous current based on maximum allowable junction temperature.
- ② Repetitive rating; pulse width limited by max. junction temperature.
- ③ The power dissipation PD is based on max. junction temperature, using junction-to-case thermal resistance.
- ④ The value of $R_{\theta JA}$ is measured with the device mounted on 1 in 2 FR-4 board with 2oz. Copper, in a still air environment with $T_A = 25^\circ\text{C}$

Mechanical Data:



Ordering and Marking Information
Device Marking: SSF10N90F1
Package (Available)
TO-3P
Operating Temperature Range
C : -55 to 150 °C
Devices per Unit

Package Type	Units/Tube	Tubes/Inner Box	Units/Inner Box	Inner Boxes/Carton Box	Units/Carton Box
TO-3P	30	8	240	5	1200

Reliability Test Program

Test Item	Conditions	Duration	Sample Size
High Temperature Reverse Bias(HTRB)	$T_j=125^{\circ}\text{C}$ to 150°C @ 80% of Max $V_{DSS}/V_{CES}/V_R$	168 hours 500 hours 1000 hours	3 lots x 77 devices
High Temperature Gate Bias(HTGB)	$T_j=150^{\circ}\text{C}$ or 150°C @ 100% of Max V_{GSS}	168 hours 500 hours 1000 hours	3 lots x 77 devices

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