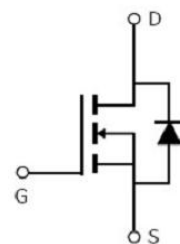


Main Product Characteristics:

V_{DSS}	650V
$R_{DS(on)}$	0.65Ω (typ.)
I_D	10A ^①



TO-220F
SSF10N60CFL



Schematic Diagram

Features and Benefits:

- Advanced MOSFET process technology
- Special designed for PWM, load switching and general purpose applications
- Ultra low on-resistance with low gate charge
- Fast switching and reverse body recovery
- 150°C operating temperature


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 ^① $V_{GS} @ 10V$	10	A
I_{DM}	Pulsed Drain Current ^②	38	
$P_D @ TC = 25^\circ C$	Power Dissipation ^③	65	W
V_{DS}	Drain-Source Voltage	650	V
V_{GS}	Gate-to-Source Voltage	± 30	V
E_{AS}	Single Pulse Avalanche Energy @ L=0.5mH	562	mJ
I_{AS}	Avalanche Current	7.5	A
$T_J \quad T_{STG}$	Operating Junction and Storage Temperature Range	-55 to +150	°C

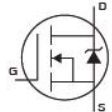
Thermal Resistance

Symbol	Characterizes	Typ.	Max.	Units
$R_{\theta JC}$	Junction-to-case ③	—	1.92	$^{\circ}C/W$
$R_{\theta JA}$	Junction-to-ambient ($t \leq 10s$) ④	—	62.5	$^{\circ}C/W$

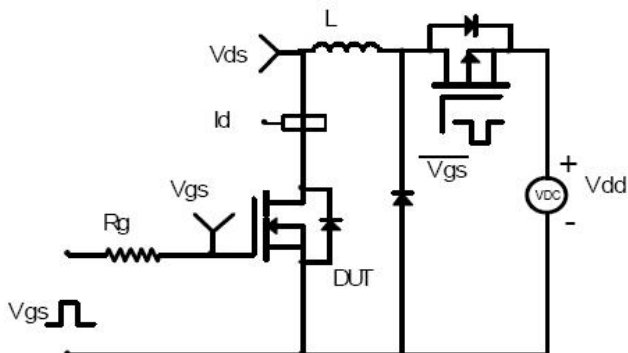
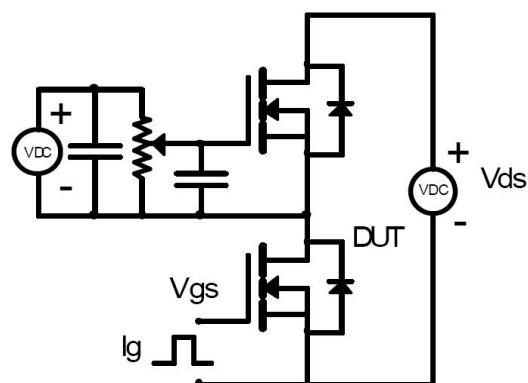
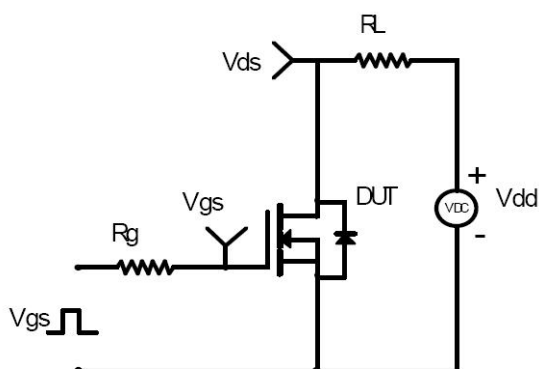
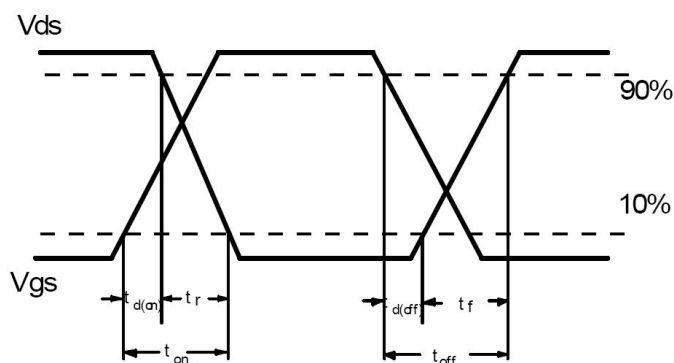
Electrical Characterizes @ $T_A=25^{\circ}C$ unless otherwise specified

Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
$V_{(BR)DSS}$	Drain-to-Source breakdown voltage	650	—	—	V	$V_{GS} = 0V, I_D = 250\mu A$
$R_{DS(on)}$	Static Drain-to-Source on-resistance	—	0.65	0.8	Ω	$V_{GS}=10V, I_D = 3.2A$
$V_{GS(th)}$	Gate threshold voltage	2	—	4	V	$V_{DS} = V_{GS}, I_D = 250\mu A$
I_{DSS}	Drain-to-Source leakage current	—	—	1	μA	$V_{DS} = 650V, V_{GS} = 0V$
I_{GSS}	Gate-to-Source forward leakage	—	—	100	nA	$V_{GS} = 30V, V_{DS} = 0V$
		—	—	-100		$V_{GS} = -30V, V_{DS} = 0V$
Q_g	Total gate charge	—	35	—	nC	$I_D = 10A,$ $V_{DS}=520V$ $V_{GS} = 10V$
Q_{gs}	Gate-to-Source charge	—	7	—		
Q_{gd}	Gate-to-Drain("Miller") charge	—	18	—		
$t_{d(on)}$	Turn-on delay time	—	23	—	ns	$V_{DS} = 325V,$ $R_{GEN}=25\Omega, I_D = 10A$
t_r	Rise time	—	15	—		
$t_{d(off)}$	Turn-Off delay time	—	90	—		
t_f	Fall time	—	30	—		
C_{iss}	Input capacitance	—	1264	—	pF	$V_{GS} = 0V$ $V_{DS} = 100V$ $f = 1MHz$
C_{oss}	Output capacitance	—	149	—		
C_{riss}	Reverse transfer capacitance	—	18	—		

Source-Drain Ratings and Characteristics

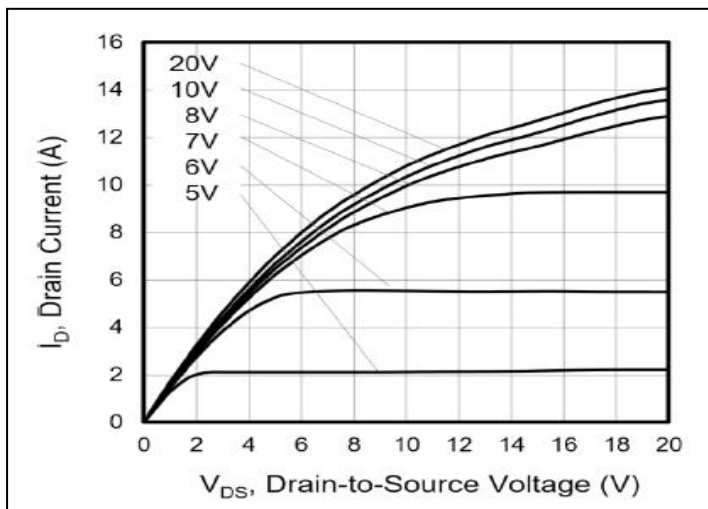
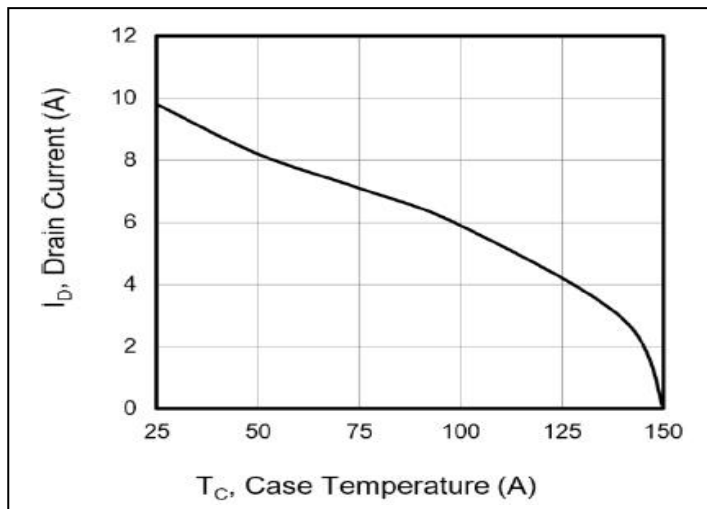
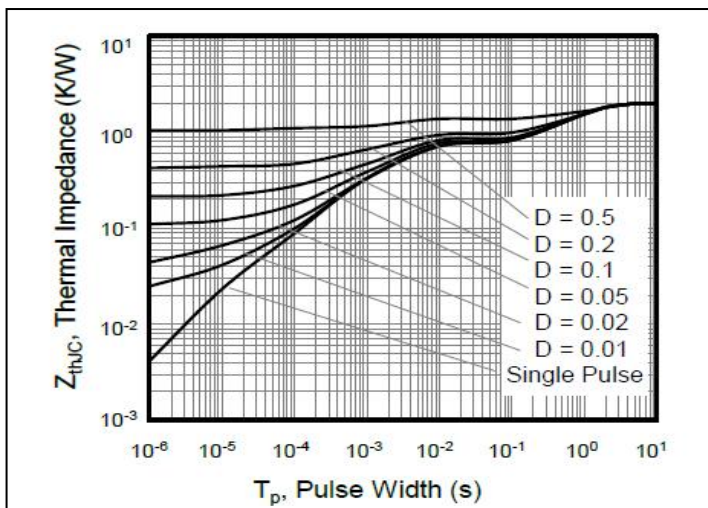
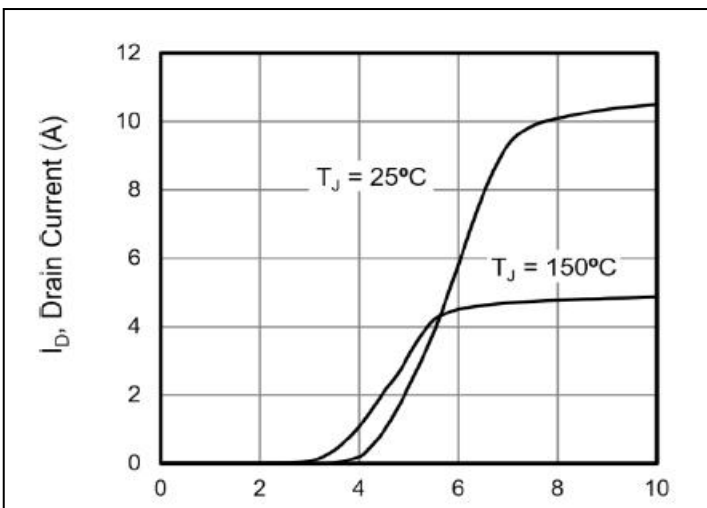
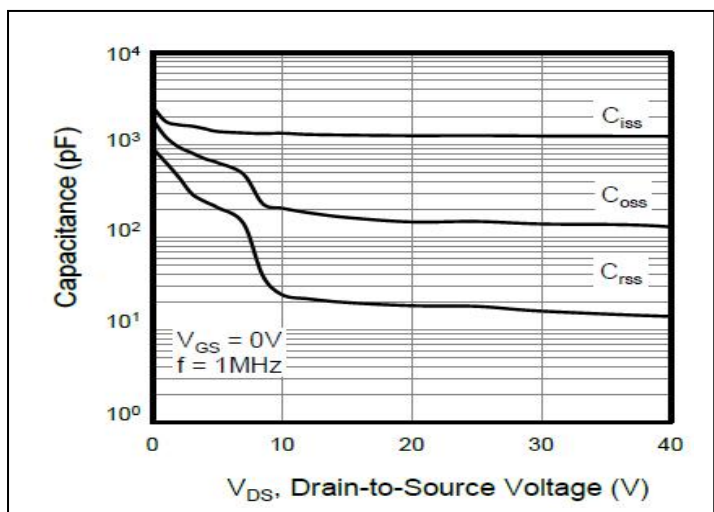
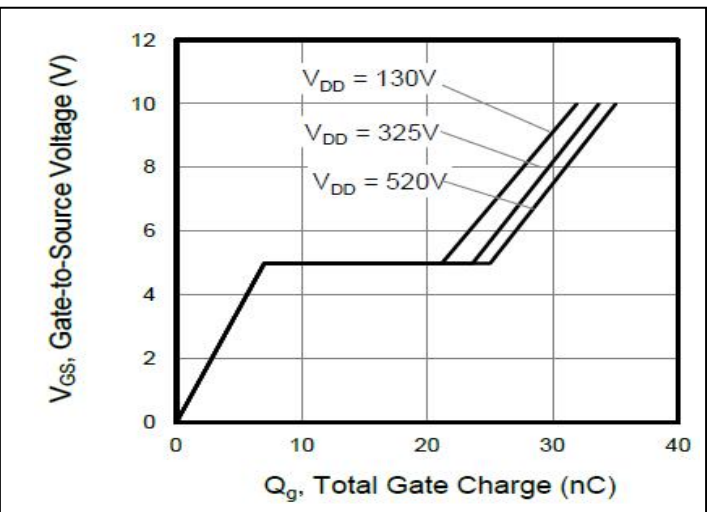
Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
I_S	Continuous Source Current ① (Body Diode)	—	—	10	A	MOSFET symbol showing the integral reverse p-n junction diode. 
I_{SM}	Pulsed Source Current (Body Diode)	—	—	38	A	
V_{SD}	Diode Forward Voltage	—	—	1.4	V	$I_S=7A, V_{GS}=0V$
t_{rr}	Reverse Recovery Time	—	320	—	nS	$I_S=7A, V_{GS}=0V,$
Q_{rr}	Reverse Recovery Charge	—	4.2	—	μC	$di/dt = 100A/\mu s$

Test Circuits and Waveforms

EAS Test Circuit:

Gate Charge Test Circuit:

Switching Time Test Circuit:

Switching Waveforms:


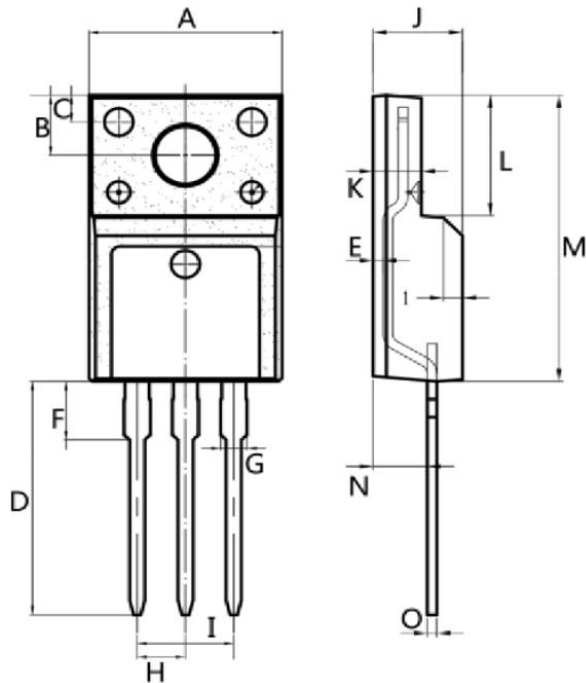
Notes:

- 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 $T_A = 25^\circ\text{C}$

Typical Electrical and Thermal Characteristics

Figure1. Typical Output Characteristics

Figure2. Drain Current vs. Temperature

Figure3. Transient Thermal Impedance

Figure4. Transfer Characteristics

Figure5. Capacitance

Figure6. Gate Charge

Mechanical Data:

TO-220F Package Outline(Unit:mm)



Dim.	Min.	Max.
A	9.9	10.3
B	2.9	3.5
C	1.15	1.45
D	12.75	13.25
E	0.55	0.75
F	3.1	3.5
G	1.25	1.45
H	Typ 2.54	
I	Typ 5.08	
J	4.55	4.75
K	2.4	2.7
L	6.35	6.75
M	15.0	16.0
N	2.75	3.15
O	0.45	0.60
All Dimensions in millimeter		

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