

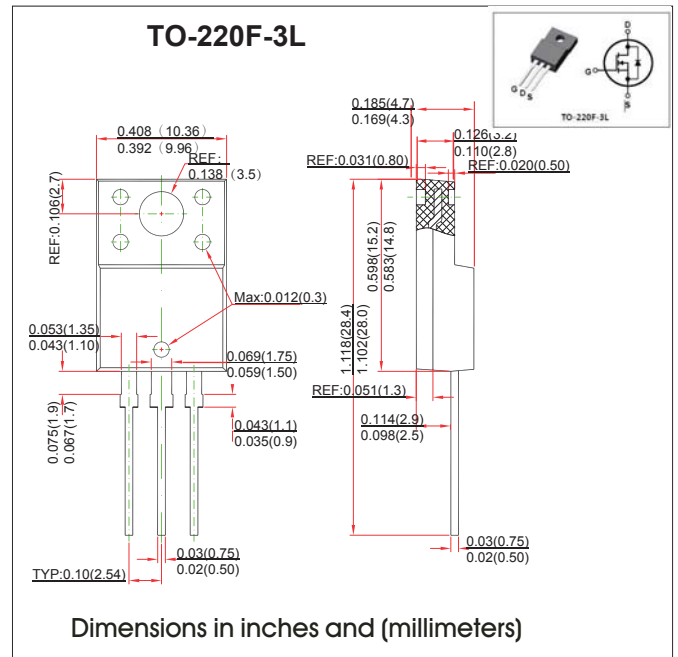
TO-220-3L Plastic-Encapsulate MOSFETS

Features

- 600V N-Channel Power MOSFET
- $R_{DS(ON)} < 3.6\Omega @ V_{GS} = 10V, I_D = 1.5A$
- Fast switching capability
- Lead free in compliance with EU RoHS directive.
- Improved dv/dt capability, high ruggedness

MECHANICAL DATA

- Case style: TO-220F-3L molded plastic
- Mounting position: any



MAXIMUM RATINGS AND CHARACTERISTICS

@ 25°C Ambient Temperature (unless otherwise noted)

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V_{DSS}	600	V
Gate-Source Voltage		V_{GSS}	± 30	V
Avalanche Current (Note 2)		I_{AR}	3.0	A
Continuous Drain Current		I_D	3.0	A
Pulsed Drain Current (Note 2)		I_{DM}	12	A
Avalanche Energy	Single Pulsed (Note 3)	E_{AS}	200	mJ
Power Dissipation	TO-220/TO-262/TO-263	P_D	75	W
	ITO-220		34	W
	TO-251/TO-252		50	W
Junction Temperature		T_J	+150	°C
Operating Temperature		T_{OPR}	-55 ~ +150	°C
Storage Temperature		T_{STG}	-55 ~ +150	°C

Notes: 1. Absolute maximum ratings are those values beyond which the device could be permanently damaged.

Absolute maximum ratings are stress ratings only and functional device operation is not implied.

2. Repetitive Rating : Pulse width limited by T_J .

3. $L = 44.4mH, I_{AS}=3A, V_{DD}=50V, R_G=25\ \Omega, \text{Starting } T_J = 25^\circ C$

THERMAL DATA

PARAMETER		SYMBOL	RATING	UNIT
Junction to Ambient	TO-220/ITO-220 TO-262/TO-263	θ_{JA}	62.5	°C/W
	TO-251/ TO-252		110	
	TO-220/TO-262/TO-263		1.70	
Junction to Case	ITO-220	θ_{JC}	3.70	°C/W
	TO-251/ TO-252		2.6	

RATINGS AND CHARACTERISTIC CURVES

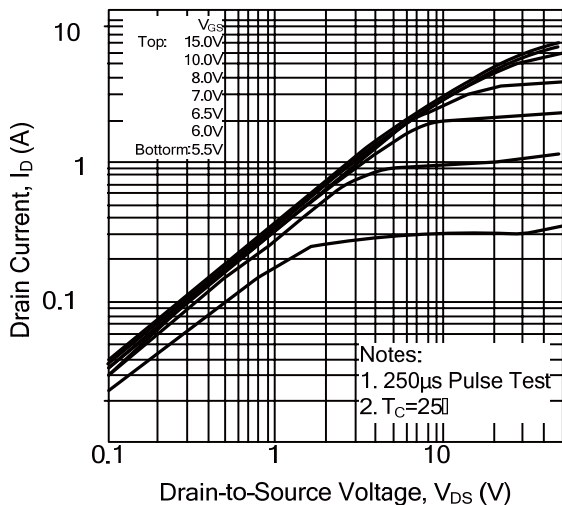
MOSFET ELECTRICAL CHARACTERISTICS $T_A=25^\circ\text{C}$ unless otherwise specified

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS} = 0V, I_D = 250\mu A$	600			V
Drain-Source Leakage Current	I_{DSS}	$V_{DS} = 600V, V_{GS} = 0V$			10	μA
Gate-Source Leakage Current	Forward	I_{GSS}			100	nA
	Reverse				-100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	2.0		4.0	V
Static Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=1.5A$			3.6	Ω
DYNAMIC CHARACTERISTICS						
Input Capacitance	C_{ISS}	$V_{DS} = 25V, V_{GS} = 0V,$ $f = 1MHz$		350	450	pF
Output Capacitance	C_{OSS}			50	65	pF
Reverse Transfer Capacitance	C_{RSS}			5.5	7.5	pF
SWITCHING CHARACTERISTICS						
Turn-On Delay Time	$t_{D(ON)}$	$V_{DD}=30V, I_D=0.5A,$ $R_G=25\Omega$ (Note 1, 2)		35	50	ns
Turn-On Rise Time	t_R			60	70	ns
Turn-Off Delay Time	$t_{D(OFF)}$			100	150	ns
Turn-Off Fall Time	t_F			65	75	ns
Total Gate Charge	Q_G	$V_{DS}=50V, I_D=1.3A, I_G=100\mu A$ $V_{GS}=10V$ (Note 1, 2)		18.5	23	nC
Gate-Source Charge	Q_{GS}			5.2	-	nC
Gate-Drain Charge	Q_{GD}			4.9	-	nC
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Drain-Source Diode Forward Voltage	V_{SD}	$V_{GS}=0V, I_S=3.0A$			1.4	V
Maximum Continuous Drain-Source Diode Forward Current	I_S				3.0	A
Maximum Pulsed Drain-Source Diode Forward Current	I_{SM}				12	A
Reverse Recovery Time	t_{rr}	$V_{GS} = 0V, I_S = 3A,$		210		ns
Reverse Recovery Charge	Q_{RR}	$di_F/dt = 100A/\mu s$ (Note 1)		1.2		μC

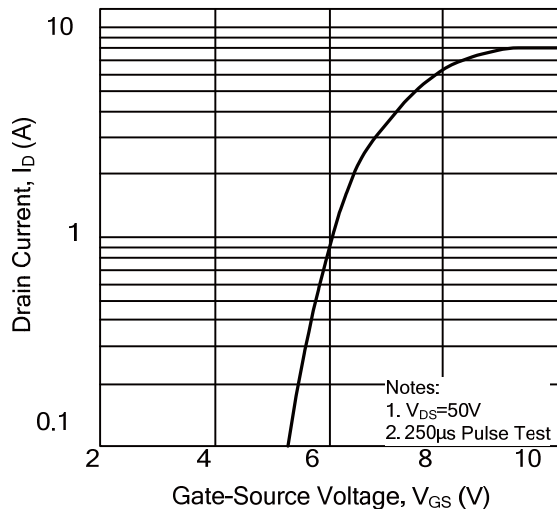
- Notes: 1. Pulse Test: Pulse width $\leq 300\mu s$, Duty cycle $\leq 2\%$
2. Essentially independent of operating temperature

RATINGS AND CHARACTERISTIC CURVES

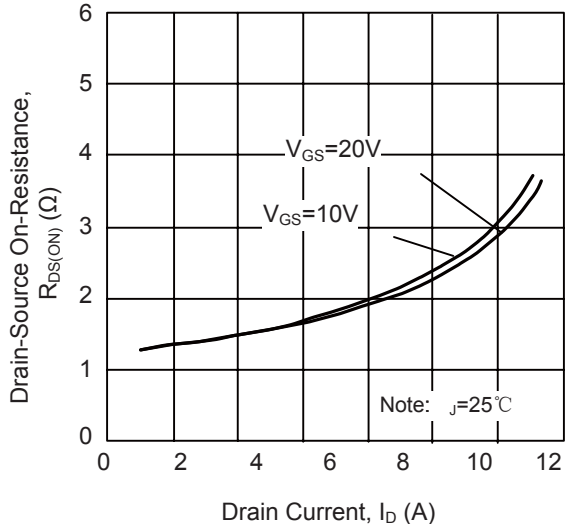
On-State Characteristics



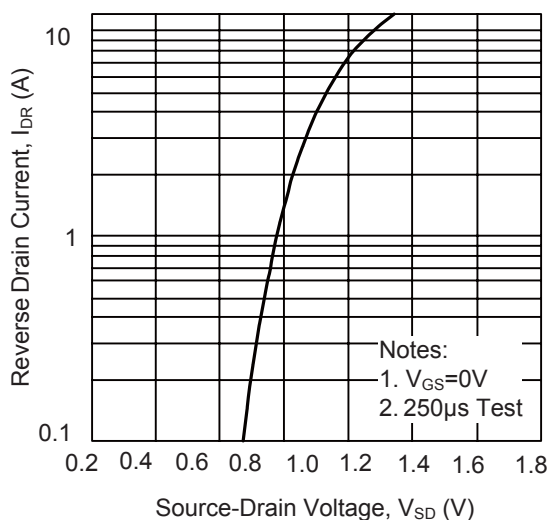
Transfer Characteristics



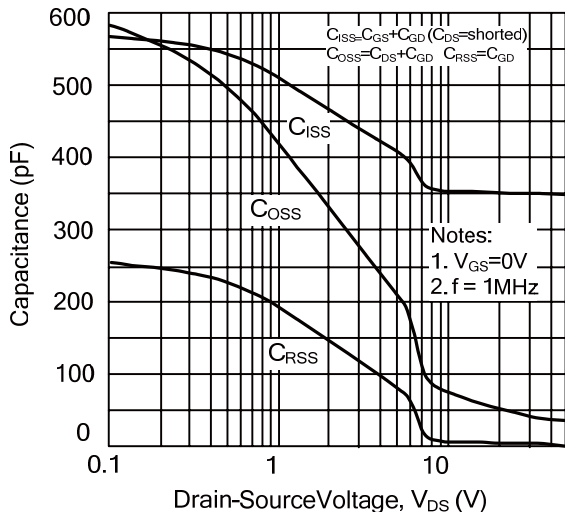
On-Resistance Variation vs. Drain Current and Gate Voltage



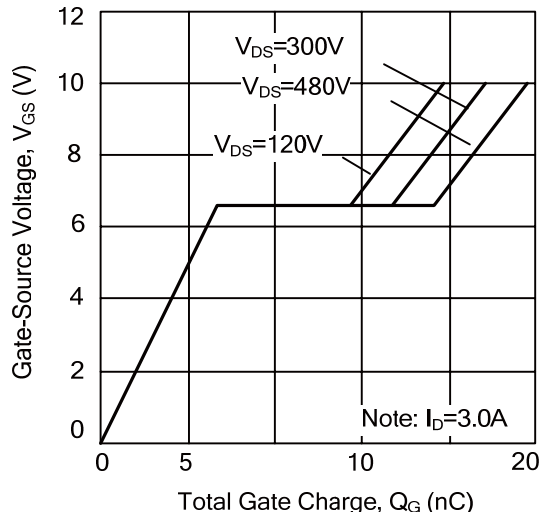
On State Current vs. Allowable Case Temperature



Capacitance Characteristics (Non-Repetitive)



Gate Charge Characteristics



RATINGS AND CHARACTERISTIC CURVES

