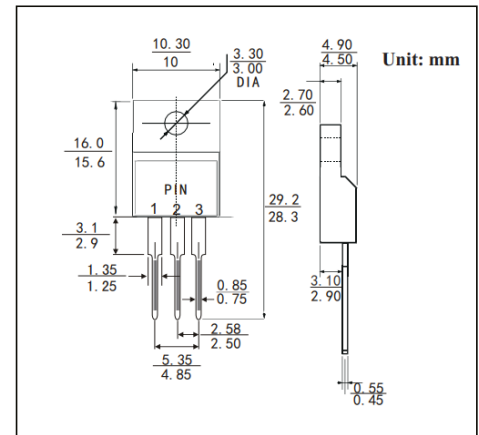


TO-220F Plastic-Encapsulate MOSFETS
FEATURE

- High Current Rating
- Lower RDS(on)
- Low Reverse Transfer
- Capacitance Fast Switching Capability
- Tighter VSD Specifications Avalanche Energy Specified
- N-Channel Power MOSFET

MECHANICAL DATA

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


MAXIMUM RATINGS AND CHARACTERISTICS

@ 25°C Ambient Temperature (unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	650	V
Gate-Source Voltage	V_{GS}	± 30	
Continuous Drain Current	I_D	20	A
Pulsed Drain Current(note1)	I_{DM}	70	
Single Pulsed Avalanche Energy (note2)	E_{AS}	185	mJ
Thermal Resistance from Junction to Ambient	$R_{\theta JA}$	62.5	°C/W
Junction and Storage Temperature Range	T_J, T_{STG}	-55 ~ +150	°C
Maximum lead temperature for soldering purposes , 1/8"from case for 5 seconds	T_L	260	

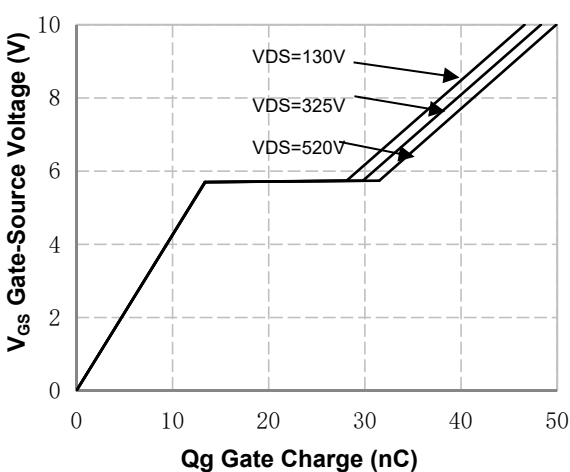
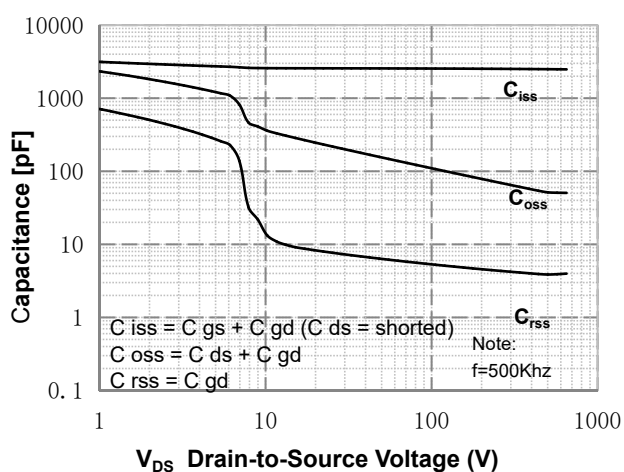
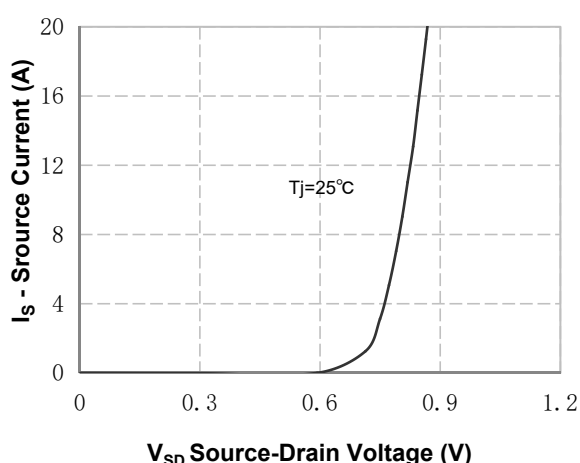
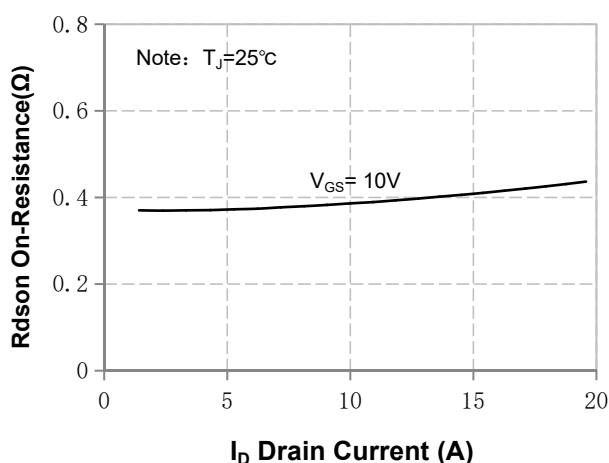
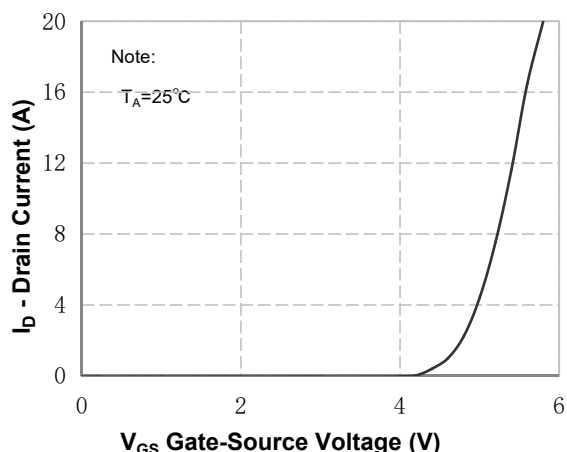
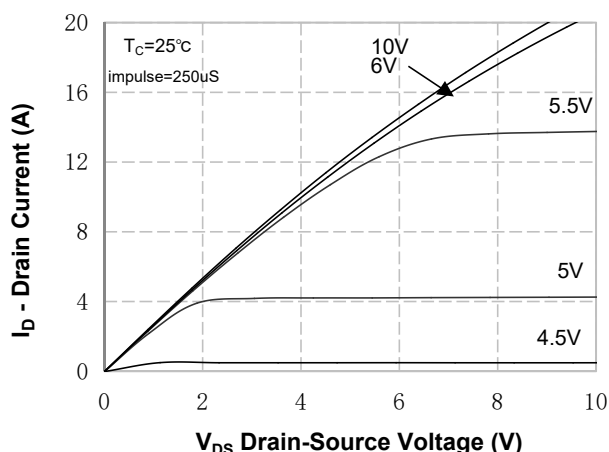
MOSFET ELECTRICAL CHARACTERISTICS $T_A=25^\circ\text{C}$ unless otherwise specified

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Off characteristics						
Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 250\mu A$	650			V
Zero gate voltage drain current	I_{DSS}	$V_{DS} = 650V, V_{GS} = 0V$			1	μA
Gate-body leakage curren (note3)	I_{GSS}	$V_{DS} = 0V, V_{GS} = \pm 30V$			± 100	nA
On characteristics (note3)						
Gate-threshold voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	2.0	3.5	4.0	V
Static drain-source on-resistance	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 10A$		0.4	0.58	Ω
Dynamic characteristics (note 4)						
Input capacitance	C_{iss}	$V_{DS} = 25V, V_{GS} = 0V, f = 1MHz$		2570		pF
Output capacitance	C_{oss}			220		
Reverse transfer capacitance	C_{rss}			7.7		
Switching characteristics (note1,3 4)						
Total gate charge	Q_g	$V_{DS} = 520V, V_{GS} = 10V, I_D = 20A$		13.4	54	nC
Gate-source charge	Q_{gs}			17.8		
Gate-drain charge	Q_{gd}			2		
Turn-on delay time	$t_{d(on)}$	$V_{DD} = 400V, V_{GS} = 10V, R_G = 20\Omega, I_D = 20A$		96		ns
Turn-on rise time	t_r			46		
Turn-off delay time	$t_{d(off)}$			91		
Turn-off fall time	t_f			32		
Drain-Source Diode Characteristics						
Drain-source diode forward voltage(note3)	V_{SD}	$V_{GS} = 0V, I_S = 20A$			1.2	V
Maximum continuous drain-source diode forward current	I_S				20	A
Maximum pulsed drain-source diode forward current	I_{SM}				80	A

Notes :

1. Repetitive Rating : Pulse width limited by maximum junction temperature
2. $L = 7.5mH, I_{AS} = 12A, V_{DD} = 50V, R_G = 25\Omega$, Starting $T_J = 25^\circ\text{C}$
3. Pulse Test : Pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
4. These parameters have no way to verify.

RATINGS AND CHARACTERISTIC CURVES



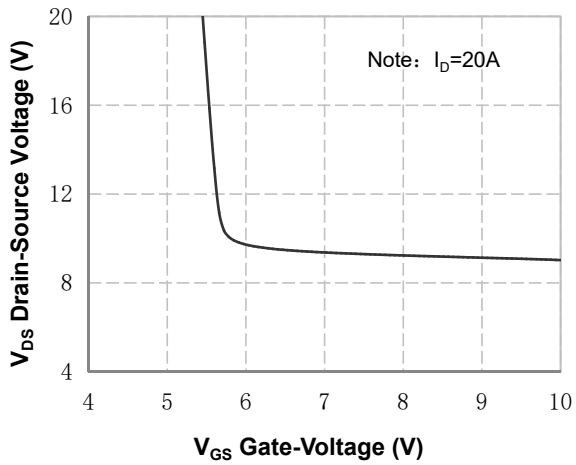


Figure 7. Vds Drain-Source Voltage vs Gate Voltage

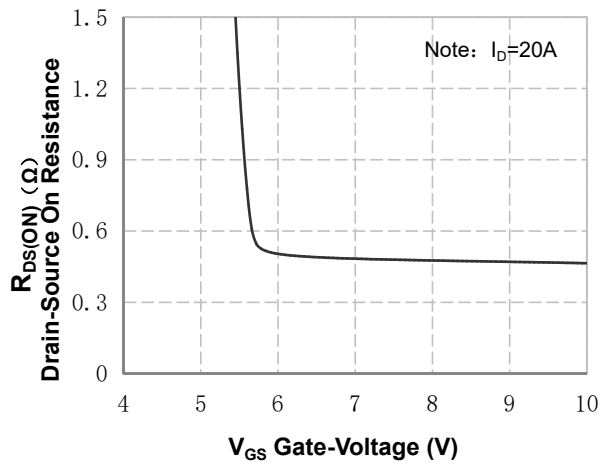


Figure 8. On-Resistance vs Gate Voltage

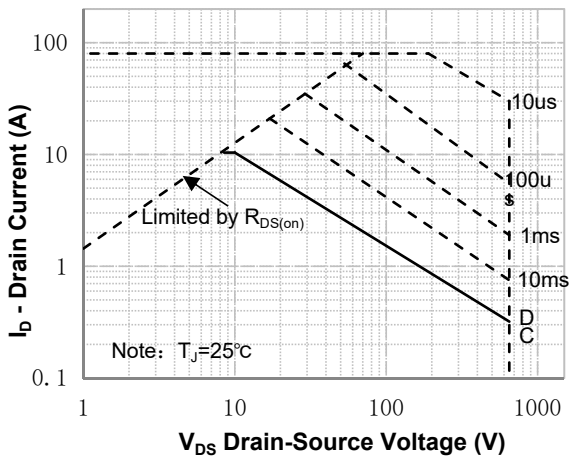


Figure 9. Maximum Safe Operating Area

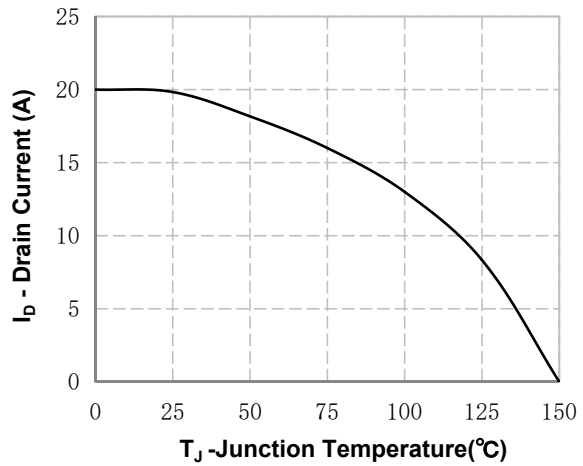


Figure 10. Maximum Drain Current vs Temperature

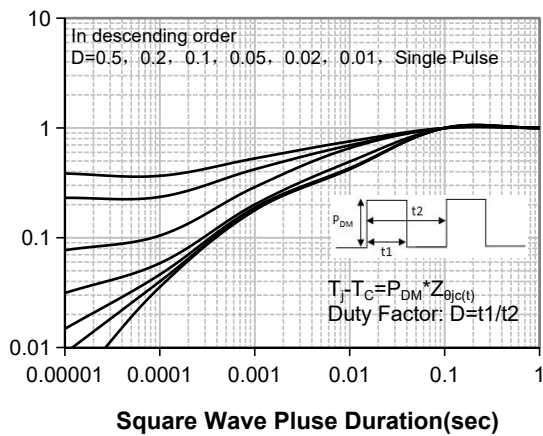
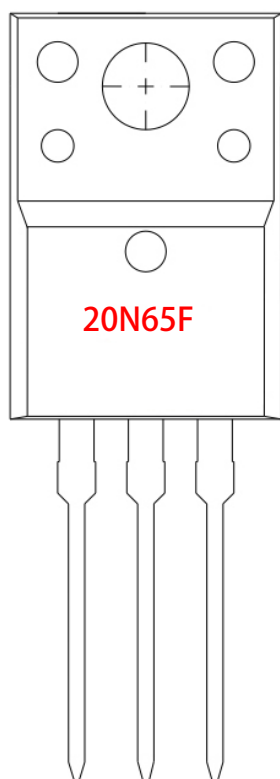


Figure 11. Transient Thermal Response Curve

Marking



Packing Information

Package	Tube (mm)	QTY/Tube (Kpcs)	Box Size (mm)	QTY/Box (Kpcs)	Carton Size (mm)	QTY/Carton (Kpcs)
TO-220F	535*32.8*7	0.05	560*162*37	1.0	575*210*185	5.0