

TO-220F Plastic-Encapsulate MOSFETS

CJPF12N65

N-Channel Power MOSFET

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
650V	$0.85\Omega@10V$	12A

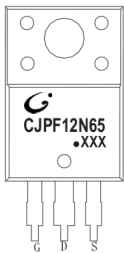
GENERAL DESCRIPTION

This advanced high voltage MOSFET is designed to stand high energy in the avalanche mode and switch efficiently. This new high energy device also offers a drain-to-source diode fast recovery time. Designed for high voltage, high speed switching applications such as power supplies, converters, power motor controls and bridge circuits.

FEATURE

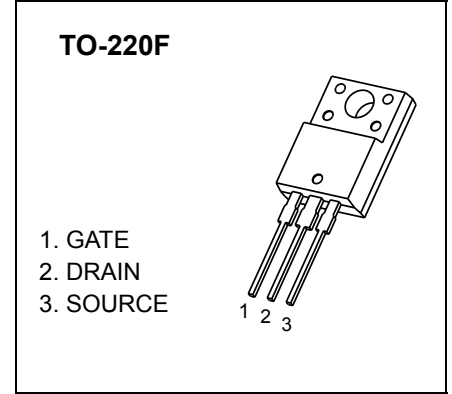
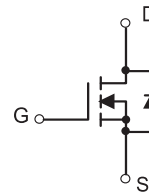
- High Current Rating
- Lower $R_{DS(on)}$
- Low Reverse Transfer Capacitance
- Fast Switching Capability
- Tighter V_{SD} Specifications
- Avalanche Energy Specified

MARKING



CJPF12N65= Device code
Solid dot = Green molding compound device,
if none, the normal device
XXX=Date Code

Equivalent Circuit



Maximum ratings ($T_a=25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	650	V
Gate-Source Voltage	V_{GSS}	± 30	
Continuous Drain Current	I_D	12	A
Pulsed Drain Current(note1)	I_{DM}	48	
Single Pulsed Avalanche Energy (note2)	E_{AS}	540	mJ
Thermal Resistance from Junction to Ambient	$R_{\theta JA}$	62.5	$^\circ\text{C}/\text{W}$
Junction and Storage Temperature Range	T_J, T_{STG}	-55 ~ +150	$^\circ\text{C}$
Maximum lead temperature for soldering purposes , 1/8"from case for 5 seconds	T_L	260	

MOSFET ELECTRICAL CHARACTERISTICS

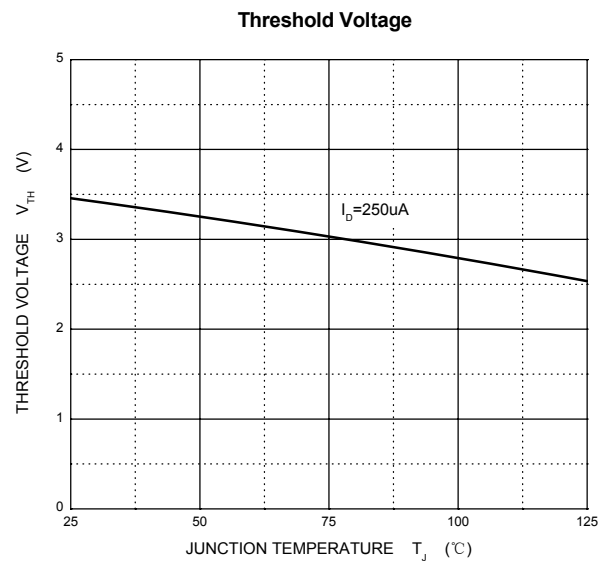
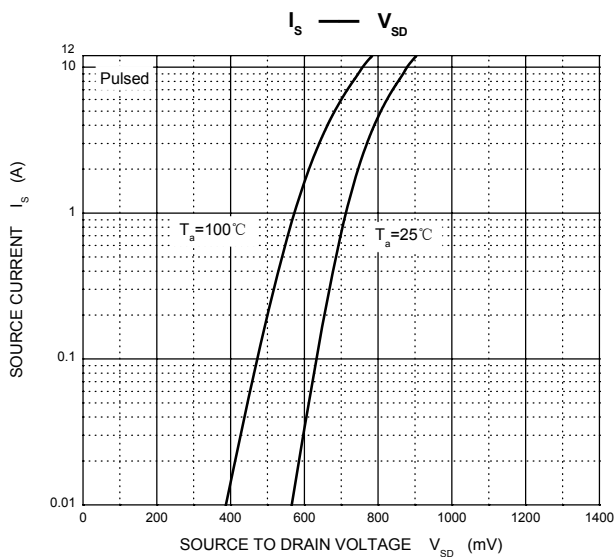
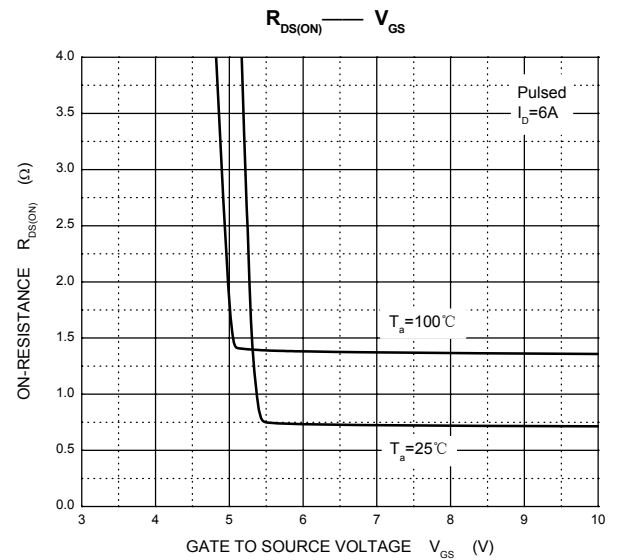
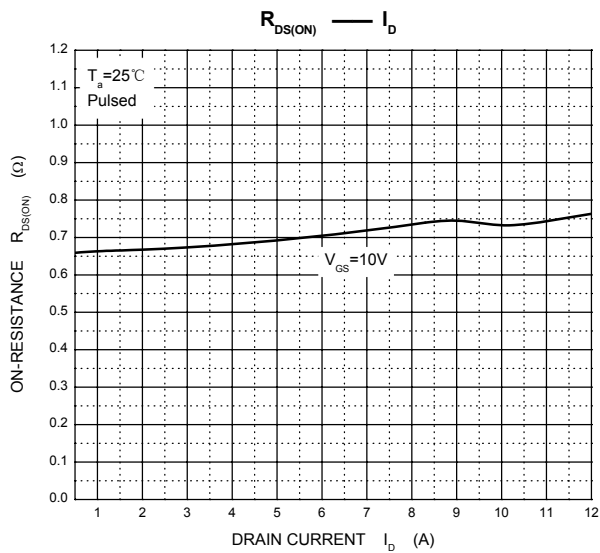
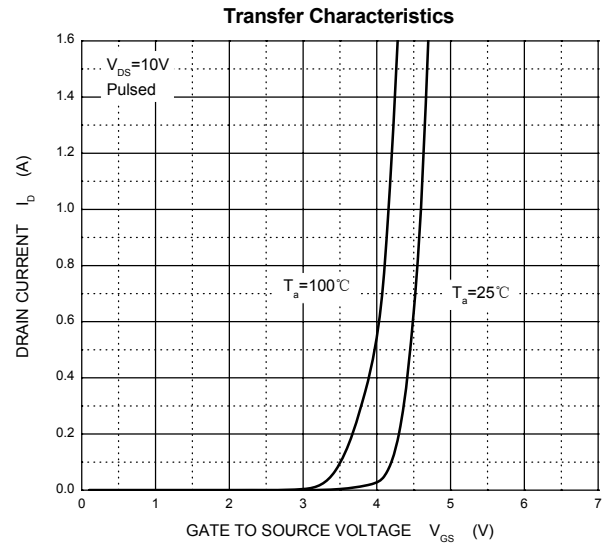
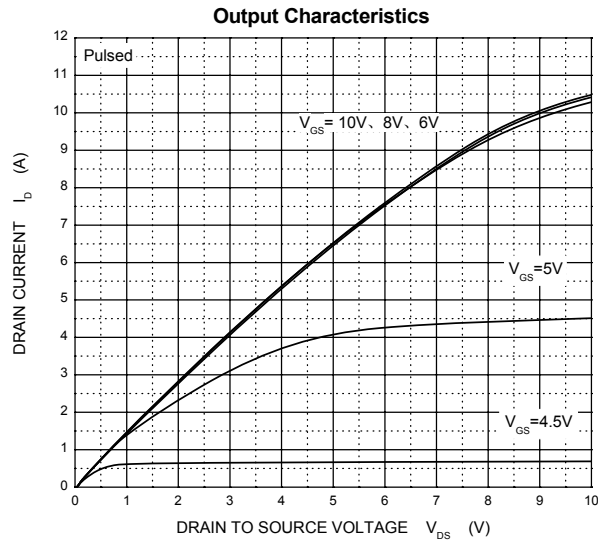
$T_a = 25^\circ\text{C}$ unless otherwise specified

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Off characteristics						
Drain-source breakdown voltage	V _{(BR)DSS}	V _{GS} = 0V, I _D =250μA	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} =± 30V			± 100	nA
On characteristics (note3)						
Gate-threshold voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	2.0	3.5	4.0	V
Static drain-source on-resistance	R _{DS(on)}	V _{GS} =10V, I _D =6A		0.7	0.85	Ω
Dynamic characteristics (note 4)						
Input capacitance	C _{iss}	V _{DS} =25V,V _{GS} =0V,f =1MHz		1800		pF
Output capacitance	C _{oss}			200		
Reverse transfer capacitance	C _{rss}			25		
Switching characteristics (note1,3 4)						
Total gate charge	Q _g	V _{DS} =520V,V _{GS} =10V,I _D =12A		42	54	nC
Gate-source charge	Q _{gs}			8.6		
Gate-drain charge	Q _{gd}			21		
Turn-on delay time	t _{d(on)}	V _{DD} =325V, V _{GS} =10V, R _G =25Ω, I _D =12A		30		ns
Turn-on rise time	t _r			90		
Turn-off delay time	t _{d(off)}			160		
Turn-off fall time	t _f			90		
Drain-Source Diode Characteristics						
Drain-source diode forward voltage(note3)	V _{SD}	V _{GS} = 0V, I _S =12A			1.4	V
Maximum continuous drain-source diode forward current	I _S				12	A
Maximum pulsed drain-source diode forward current	I _{SM}				48	A

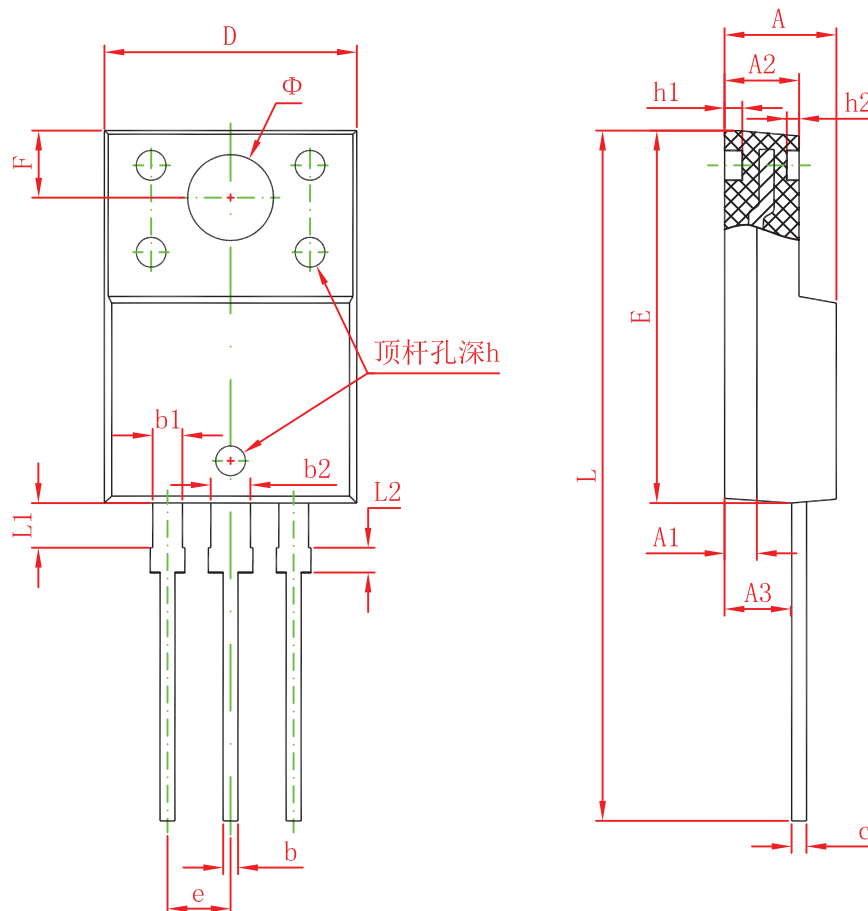
Notes :

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.

Typical Characteristics



TO-220F Package Outline Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.300	4.700	0.169	0.185
A1	1.300 REF.		0.051 REF.	
A2	2.800	3.200	0.110	0.126
A3	2.500	2.900	0.098	0.114
b	0.500	0.750	0.020	0.030
b1	1.100	1.350	0.043	0.053
b2	1.500	1.750	0.059	0.069
c	0.500	0.750	0.020	0.030
D	9.960	10.360	0.392	0.408
E	14.800	15.200	0.583	0.598
e	2.540 TYP.		0.100 TYP.	
F	2.700 REF.		0.106 REF.	
Φ	3.500 REF.		0.138 REF.	
h	0.000	0.300	0.000	0.012
h1	0.800 REF.		0.031 REF.	
h2	0.500 REF.		0.020 REF.	
L	28.000	28.400	1.102	1.118
L1	1.700	1.900	0.067	0.075
L2	0.900	1.100	0.035	0.043