JIANGSU CHANGJIANG ELECTRONICS TECHNOLOGY CO., LTD

TO-220-3L Plastic-Encapsulate MOSFETS

CJP12N65   N-Channel Power MOSFET

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

TO-220-3L

1. GATE
2. DRAIN
3. SOURCE

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.
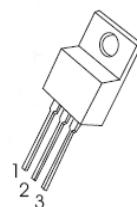
FEATURE

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

MARKING

CJP12N65= Device code
Solid dot = Green molding compound device, if none, the normal device
XXX=Date Code

Equivalent Circuit
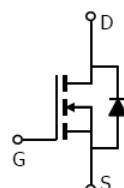
Maximum ratings (T$_a$=25℃ unless otherwise noted)

| 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	℃/W
Junction Temperature	T_J	150	℃
Storage Temperature Range	T_{STG}	-55 ~+150	
Maximum lead temperature for soldering purposes , 1/8"from case for 5 seconds	T_L	260	

MOSFET ELECTRICAL CHARACTERISTICS

T_a=25℃   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 current (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=4.7Ω, 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
Continuous drain-source diode forward current	I_S				12	A
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 = 25Ω, Starting T_J = 25°C

3.   Pulse Test : Pulse width≤300µs, duty cycle ≤2%.

4.   These parameters have no way to verify.

Typical Characteristics

Output Characteristics

Transfer Characteristics

R$_{DS(ON)}$ — I$_D$

R$_{DS(ON)}$ — V$_{GS}$

I$_S$ — V$_{SD}$

Threshold Voltage
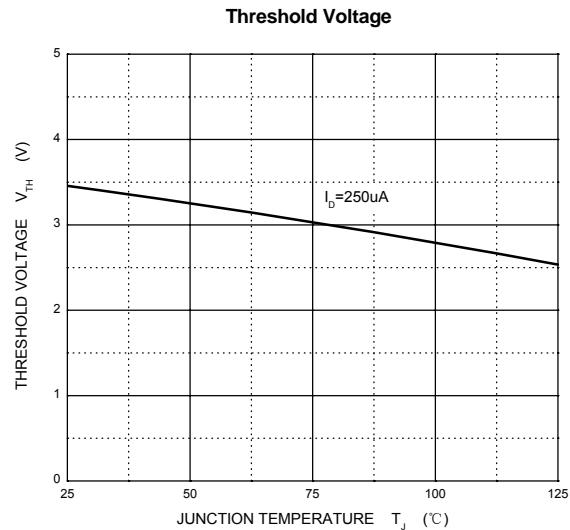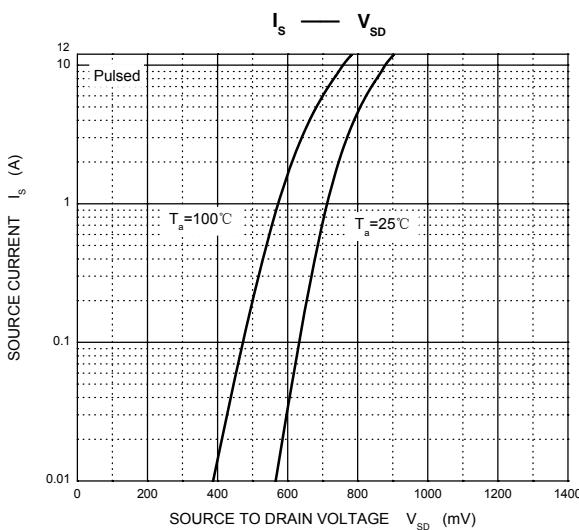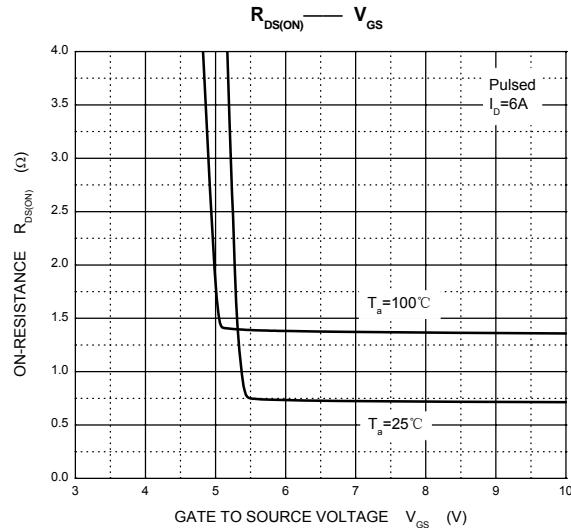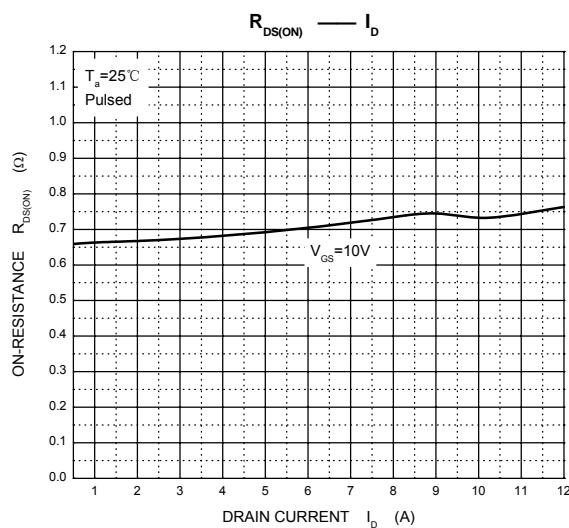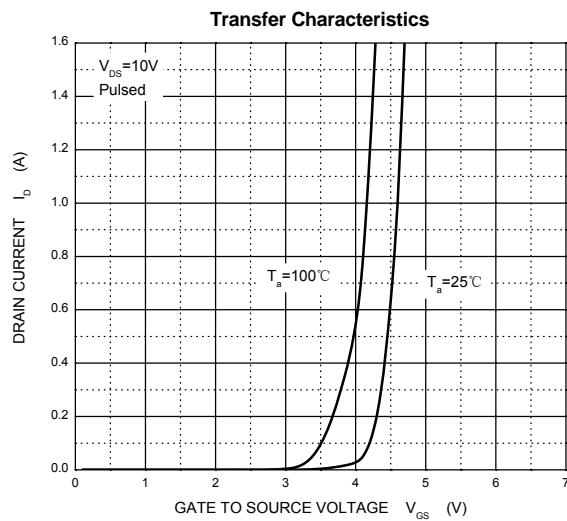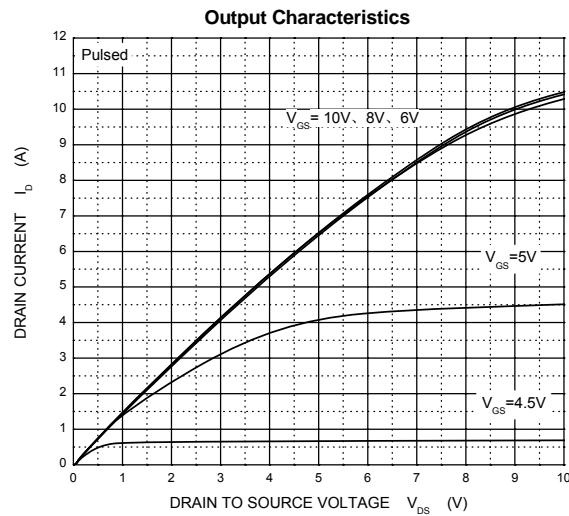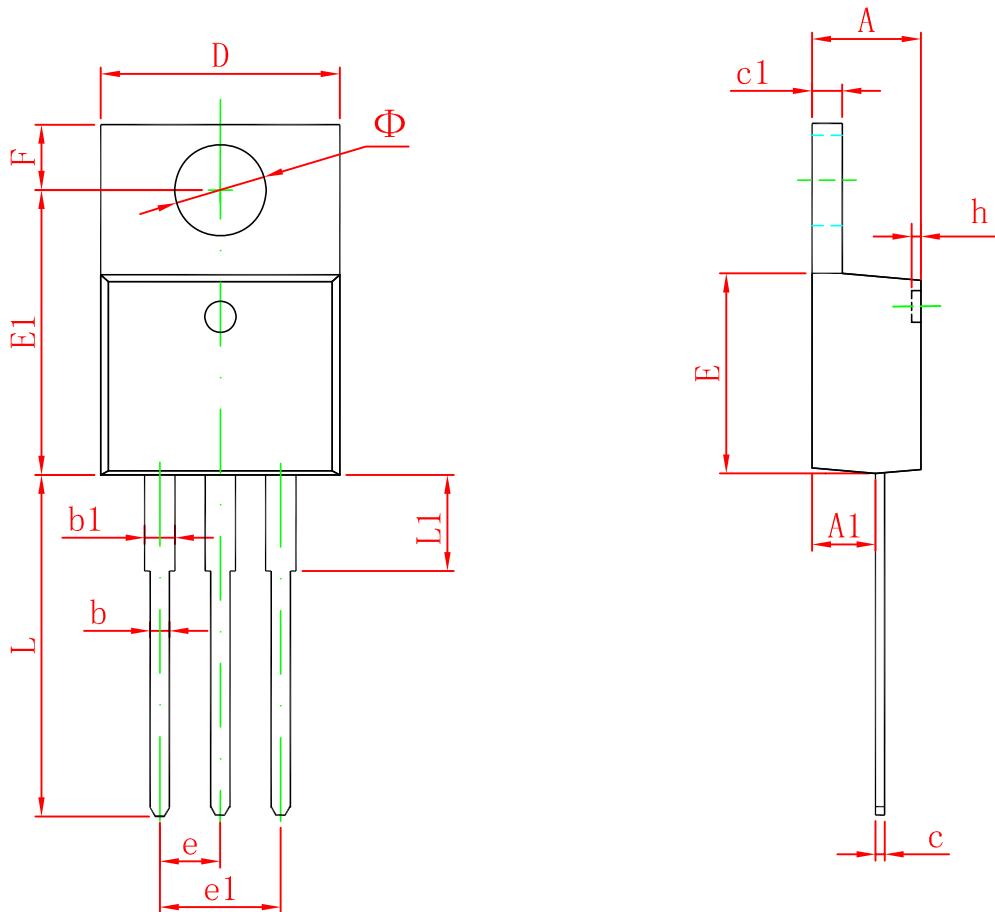
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	4.470	4.670	0.176	0.184
A1	2.520	2.820	0.099	0.111
b	0.710	0.910	0.028	0.036
b1	1.170	1.370	0.046	0.054
c	0.310	0.530	0.012	0.021
c1	1.170	1.370	0.046	0.054
D	10.010	10.310	0.394	0.406
E	8.500	8.900	0.335	0.350
E1	12.060	12.460	0.475	0.491
e	2.540 TYP		0.100 TYP	
e1	4.980	5.180	0.196	0.204
F	2.590	2.890	0.102	0.114
h	0.000	0.300	0.000	0.012
L	13.400	13.800	0.528	0.543
L1	3.560	3.960	0.140	0.156
Φ	3.735	3.935	0.147	0.155