



**TO-220-3L Plastic-Encapsulate MOSFETS**

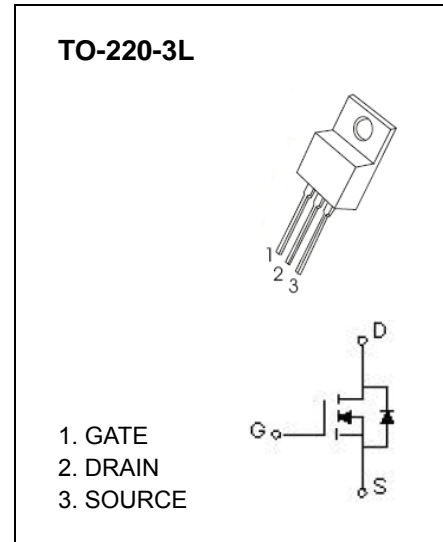
**CJP12N65 N-Channel Power MOSFET**

**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



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

Parameter	Symbol	Value	Unit
Drain-Source Voltage	$V_{DS}$	650	V
Gate-Source Voltage	$V_{GSS}$	$\pm 30$	
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	$^{\circ}C/W$
Junction Temperature	$T_J$	150	$^{\circ}C$
Storage Temperature Range	$T_{STG}$	-55 ~+150	
Maximum lead temperature for soldering purposes , 1/8"from case for 5 seconds	$T_L$	260	

**Electrical characteristics (T<sub>a</sub>=25°C unless otherwise noted)**

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
<b>Off characteristics</b>						
Drain-source breakdown voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> = 0V, I <sub>D</sub> =250μA	650			V
Zero gate voltage drain current	I <sub>DSS</sub>	V <sub>DS</sub> =650V, V <sub>GS</sub> =0V			1	μA
Gate-body leakage current (note3)	I <sub>GSS</sub>	V <sub>DS</sub> =0V, V <sub>GS</sub> =±30V			±100	nA
<b>On characteristics (note3)</b>						
Gate-threshold voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	2.0		4.0	V
Static drain-source on-resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =6A			0.85	Ω
<b>Dynamic characteristics (note 4)</b>						
Input capacitance	C <sub>iss</sub>	V <sub>DS</sub> =25V, V <sub>GS</sub> =0V, f =1MHz		1800		pF
Output capacitance	C <sub>oss</sub>			200		
Reverse transfer capacitance	C <sub>rss</sub>			25		
<b>Switching characteristics (note1,3 4)</b>						
Total gate charge	Q <sub>g</sub>	V <sub>DS</sub> =520V, V <sub>GS</sub> =10V, I <sub>D</sub> =12A		42	54	nC
Gate-source charge	Q <sub>gs</sub>			8.6		
Gate-drain charge	Q <sub>gd</sub>			21		
Turn-on delay time	t <sub>d(on)</sub>	V <sub>DD</sub> =325V, V <sub>GS</sub> =10V, R <sub>G</sub> =4.7Ω, I <sub>D</sub> =12A		30		ns
Turn-on rise time	t <sub>r</sub>			90		
Turn-off delay time	t <sub>d(off)</sub>			160		
Turn-off fall time	t <sub>f</sub>			90		
<b>Drain-Source Diode Characteristics</b>						
Drain-source diode forward voltage(note3)	V <sub>SD</sub>	V <sub>GS</sub> = 0V, I <sub>S</sub> =12A			1.4	V
Continuous drain-source diode forward current	I <sub>S</sub>				12	A
Pulsed drain-source diode forward current	I <sub>SM</sub>				48	A

**Notes :**

1. Repetitive Rating : Pulse width limited by maximum junction temperature
2. L =7.5mH, I<sub>AS</sub> = 12A, V<sub>DD</sub> = 50V, R<sub>G</sub> = 25Ω, Starting T<sub>J</sub> = 25°C
3. Pulse Test : Pulse width≤300μs, duty cycle ≤2%.
4. These parameters have no way to verify.

# Typical Characteristics

# CJP12N65

