

# TO-220-3L-C Plastic-Encapsulate MOSFETS

## CJP85N80 N-Channel Power MOSFET

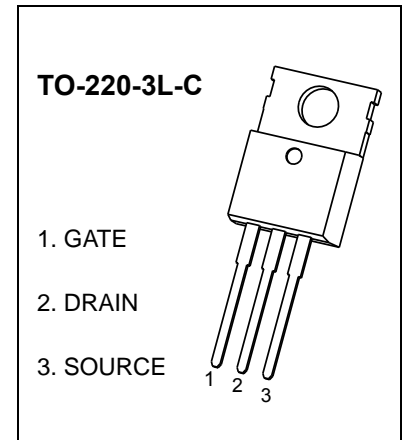
$V_{(BR)DSS}$	$R_{DS(on)MAX}$	$I_D$
85V	8.5mΩ@10V	80A

### DESCRIPTION

The CJP85N80 uses advanced trench technology and design to provide excellent  $R_{DS(on)}$  with low gate charge. Good stability and uniformity with high  $E_{AS}$ . This device is suitable for use in PWM, load switching and general purpose applications.

### FEATURE

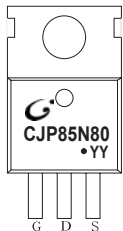
- Advanced trench process technology
- Special designed for converters and power controls
- High density cell design for ultra low  $R_{DS(on)}$
- Fully characterized avalanche voltage and current
- Fast switching
- Good stability and uniformity with high  $E_{AS}$
- Excellent package for good heat dissipation
- Special process technology for high ESD capability



### APPLICATION

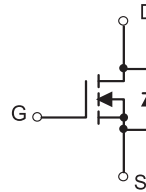
- Power switching application
- Hard switched and high frequency circuits
- Uninterruptible power supply

### MARKING



CJP85N80= Device code  
 Solid dot = Green molding compound device,  
 if none, the normal device  
 YY = Code

### EQUIVALENT CIRCUIT



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

Parameter	Symbol	Value	Unit
Drain-Source voltage	$V_{DS}$	85	V
Gate-Source Voltage	$V_{GS}$	±20	
Continuous Drain Current	$I_D$	80	A
Pulsed Drain Current (note 1)	$I_{DM}$	320	
Power Dissipation (note 2, $T_a=25^\circ\text{C}$ )	$P_D$	2	W
Maximum Power Dissipation (note 3, $T_c=25^\circ\text{C}$ )		170	W
Single Pulsed Avalanche Energy (note 4)	$E_{AS}$	620	mJ
Thermal Resistance from Junction to Ambient	$R_{\theta JA}$	62.5	$^\circ\text{C/W}$
Junction Temperature	$T_j$	150	$^\circ\text{C}$
Storage Temperature	$T_{stg}$	-55 ~+150	

Notes 1. Repetitive Rating: Pulse width limited by maximum junction temperature

2. This test is performed with no heat sink at  $T_a=25^\circ\text{C}$ .
3. This test is performed with infinite heat sink at  $T_c=25^\circ\text{C}$ .
4.  $E_{AS}$  condition:  $T_j=25^\circ\text{C}, V_{DD}=40\text{V}, V_{GS}=10\text{V}, L=0.5\text{mH}, R_g=25\Omega$ .

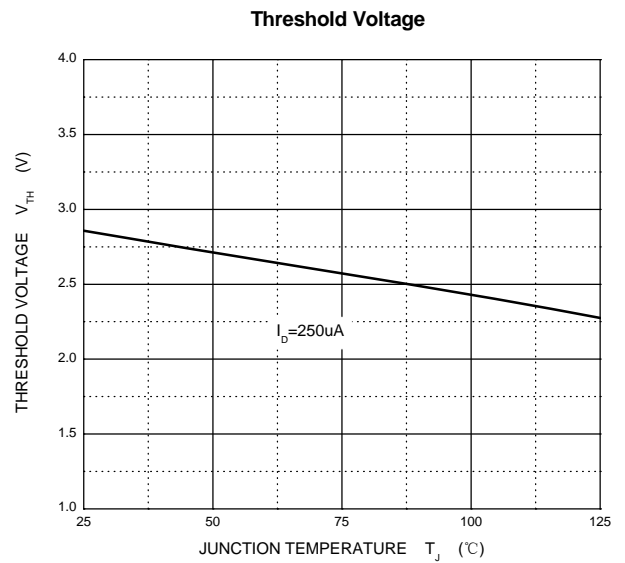
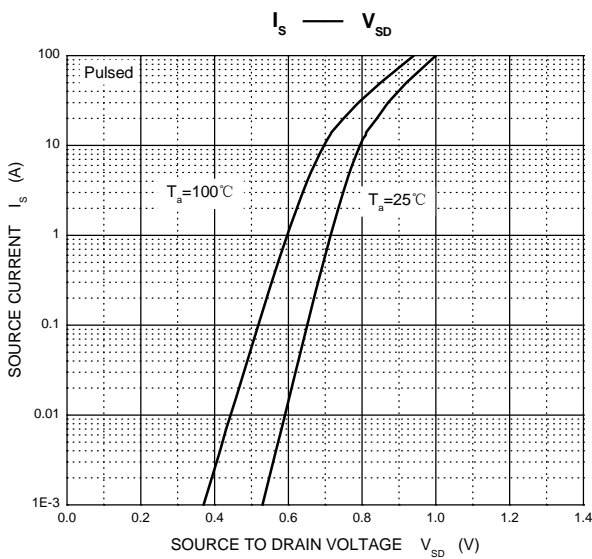
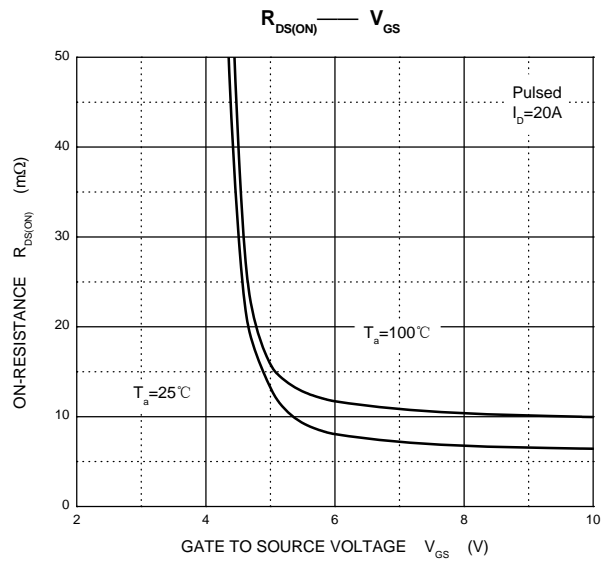
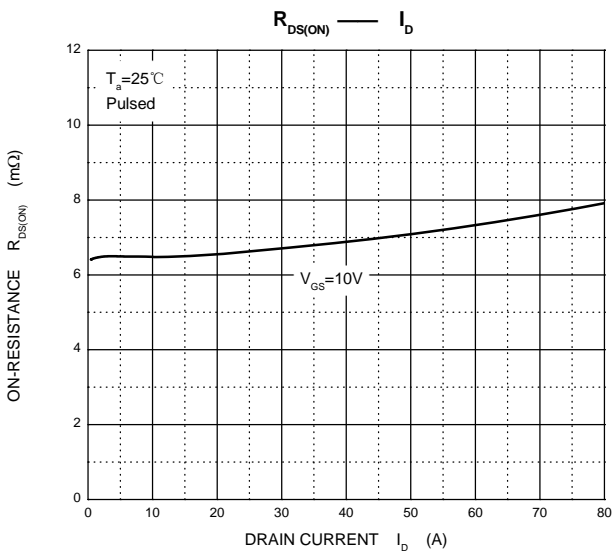
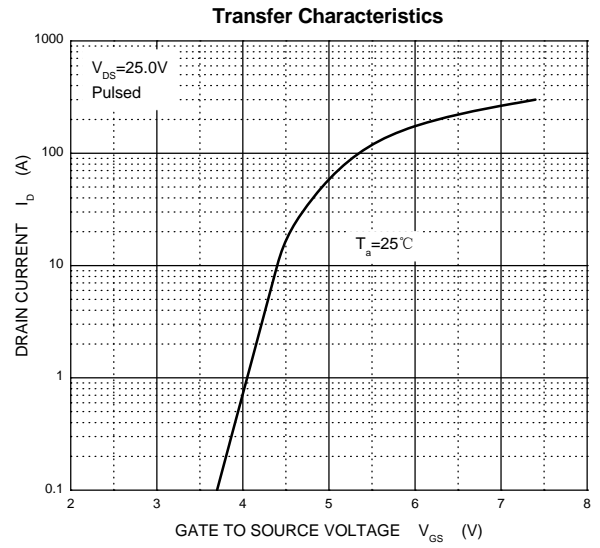
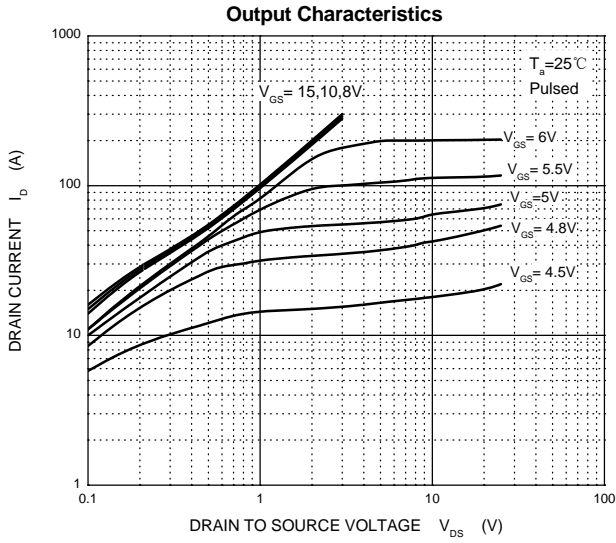
**Electrical characteristics (T<sub>a</sub>=25°C unless otherwise noted)**

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
<b>Static characteristics</b>						
Drain-source breakdown voltage	BV <sub>DSS</sub>	V <sub>GS</sub> = 0, I <sub>D</sub> =250μA	85			V
Gate-threshold voltage (note 1)	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	2.0	3.0	4.0	
Zero gate voltage drain current	I <sub>DSS</sub>	V <sub>DS</sub> =85V, V <sub>GS</sub> =0			1	μA
Gate-body leakage current	I <sub>GSS</sub>	V <sub>DS</sub> =0, V <sub>GS</sub> =±20V			±100	nA
Drain-source on-state resistance (note 1)	R <sub>DS(on)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =40A		6.8	8.5	mΩ
Forward transconductance (note 1)	g <sub>FS</sub>	V <sub>DS</sub> =10V, I <sub>D</sub> =40A		60		S
<b>Dynamic characteristics (note 2)</b>						
Input capacitance	C <sub>iss</sub>	V <sub>DS</sub> =25V, V <sub>GS</sub> =0, f =1MHz		4400		pF
Output capacitance	C <sub>oss</sub>			340		
Reverse transfer capacitance	C <sub>rss</sub>			260		
<b>Switching characteristics (note 2)</b>						
Turn-on delay time	t <sub>d(on)</sub>	V <sub>DD</sub> =30V, I <sub>D</sub> =2A, R <sub>L</sub> =15Ω, V <sub>GS</sub> =10V, R <sub>G</sub> =2.5Ω		18		ns
Rise time	t <sub>r</sub>			12		
Turn-off delay time	t <sub>d(off)</sub>			56		
Fall Time	t <sub>f</sub>			15		
Total gate charge	Q <sub>g</sub>	V <sub>DS</sub> =30V, V <sub>GS</sub> =10V, I <sub>D</sub> =30A		100		nC
Gate-source charge	Q <sub>gs</sub>			20		
Gate-drain charge	Q <sub>gd</sub>			30		
<b>Source-Drain Diode characteristics</b>						
Diode forward current	I <sub>S</sub>				80	A
Diode pulsed forward current	I <sub>SM</sub>				320	A
Diode Forward voltage (note 1)	V <sub>SD</sub>	V <sub>GS</sub> =0, I <sub>S</sub> =40A			1.2	V
Diode reverse recovery time (note 2)	t <sub>rr</sub>	I <sub>F</sub> =75A, di/dt=100A/μs			36	ns
Diode reverse recovery charge (note 2)	Q <sub>rr</sub>				56	nC

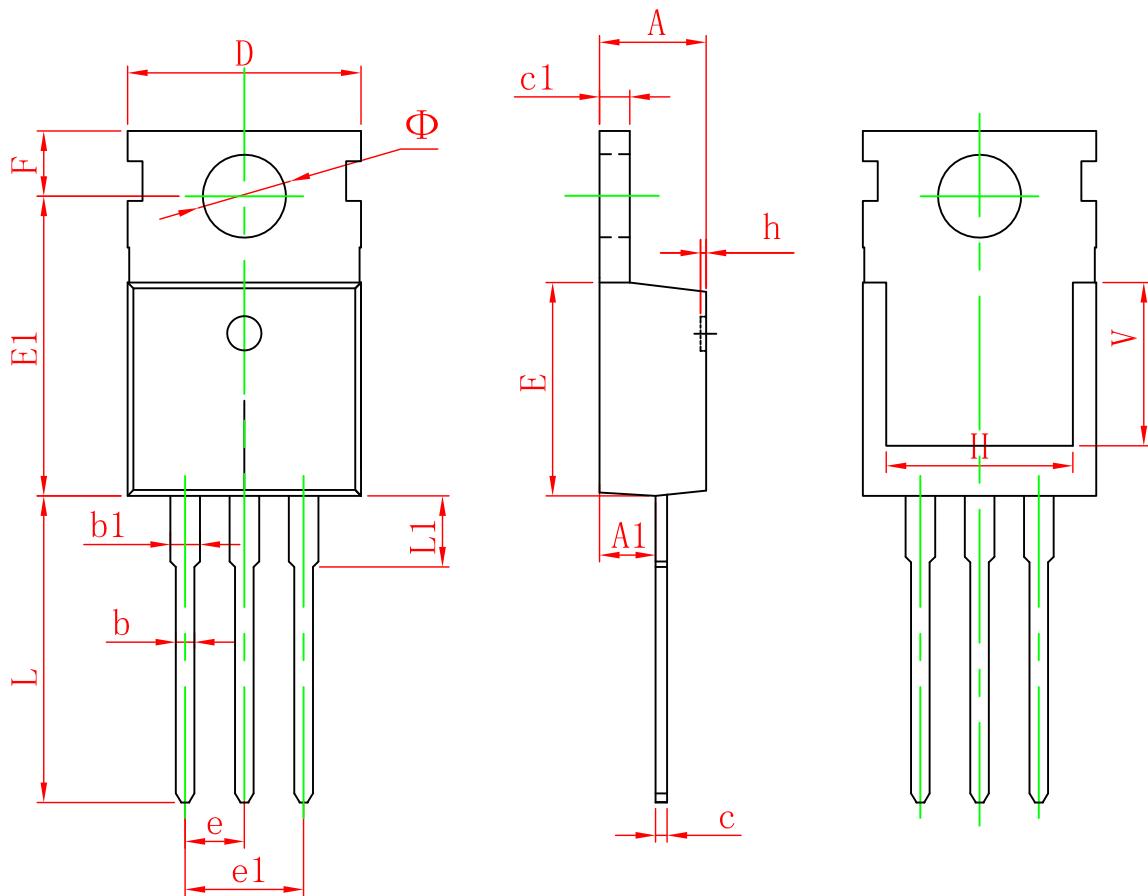
Notes: 1. Pulse Test: Pulse Width≤300μs, duty cycle ≤2%.

2. These parameters have no way to verify.

# Typical Characteristics



# TO-220-3L-C Package Outline Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.400	4.600	0.173	0.181
A1	2.250	2.550	0.089	0.100
b	0.710	0.910	0.028	0.036
b1	1.170	1.370	0.046	0.054
c	0.330	0.650	0.013	0.026
c1	1.200	1.400	0.047	0.055
D	9.910	10.250	0.390	0.404
E	8.950	9.750	0.352	0.384
E1	12.650	12.950	0.498	0.510
e	2.540 TYP.		0.100 TYP.	
e1	4.980	5.180	0.196	0.204
F	2.650	2.950	0.104	0.116
H	7.900	8.100	0.311	0.319
h	0.000	0.300	0.000	0.012
L	12.900	13.400	0.508	0.528
L1	2.850	3.250	0.112	0.128
V	7.500 REF.		0.295 REF.	
$\Phi$	3.400	3.800	0.134	0.150