

TO-220F Plastic-Encapsulate MOSFETS

CJPF05N60 N-Channel Power MOSFET

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
600V	2.5Ω@10V	4.5A

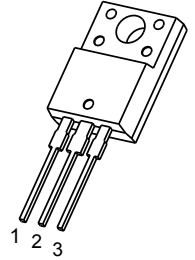
Description

This advanced high voltage MOSFET is designed to withstand high energy in the avalanche mode and switch efficiently. This new high energy device also offers a drain-to-source diode with fast recovery time.

Designed for high voltage, high speed switching applications such as power supplies, converters, power motor controls and bridge circuits.

TO-220F

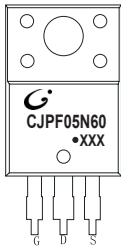
1. GATE
2. DRAIN
3. SOURCE



FEATURES

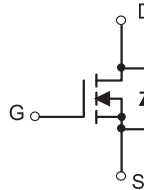
- Low $R_{DS(on)}$
- Lower Capacitances
- Lower Total Gate Charge
- Tighter V_{SD} Specifications
- Avalanche Energy Specified

MARKING



CJPF05N60= Device code
 Solid dot = Green molding compound device,
 if none, the normal device
 XXX=Date Code

EQUIVALENT CIRCUIT



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

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	600	V
Gate-Source Voltage	V_{GS}	±30	
Continuous Drain Current	I_D	4.5	A
Single Pulsed Avalanche Energy (note1)	E_{AS}	250	mJ
Power Dissipation (note2, $T_a=25^{\circ}C$)	P_D	2	W
Maximum Power Dissipation (note3, $T_c=25^{\circ}C$)		120	
Thermal Resistance from Junction to Ambient	$R_{\theta JA}$	62.5	$^{\circ}C/W$
Junction Temperature	T_J	150	$^{\circ}C$
Storage Temperature	T_{stg}	-50 ~+150	

MOSFET ELECTRICAL CHARACTERISTICS

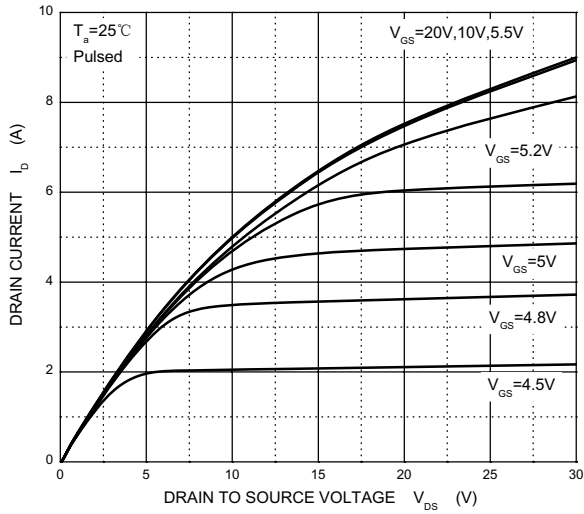
$T_a=25^\circ\text{C}$ unless otherwise specified

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Gate-Body Leakage Current (note 4)	I_{GSS}	$V_{DS}=0V, V_{GS}=\pm 30V$			± 100	nA
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu A$	600			V
Gate-Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	2.0	3.5	4.0	
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=600V, V_{GS}=0V$			1	μA
Forward transconductance	g_{fs}	$V_{DS}=40V, I_D=2.25A$	2.9			S
Drain-Source On-State Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=2.25A$		1.8	2.5	Ω
Input Capacitance	C_{iss}	$V_{DS}=25V, V_{GS}=0V,$ $f=1MHz$			670	pF
Output Capacitance	C_{oss}				72	
Reverse Transfer Capacitance	C_{rss}				8.5	
Turn-On Delay Time (note 4)	$t_{d(on)}$	$V_{DD}=300V, I_D=4.5A,$ $R_G=25\Omega$			30	ns
Rise Time (note 4)	t_r				90	
Turn-Off Delay Time (note 4)	$t_{d(off)}$				85	
Fall Time (note 4)	t_f				100	
Forward on Voltage (note 4)	V_{SD}	$V_{GS}=0V, I_S=4.5A$			1.4	V

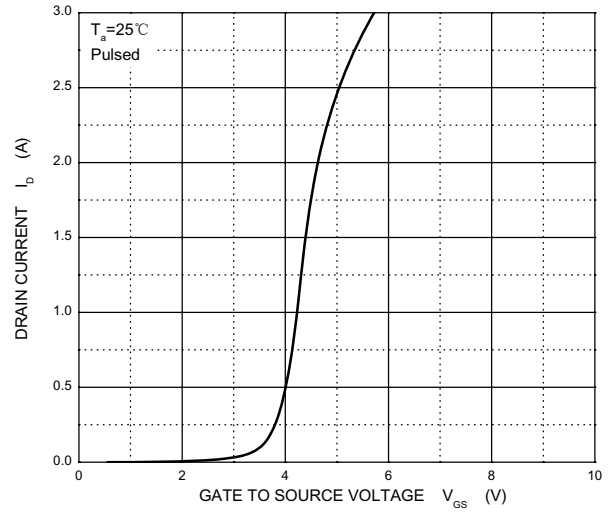
Notes:

1. E_{AS} condition: $T_j=25^\circ\text{C}$, $V_{DD}=50V, R_G=25\Omega, L=16mH, I_{AS}=5A$
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. Pulse Test : Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.

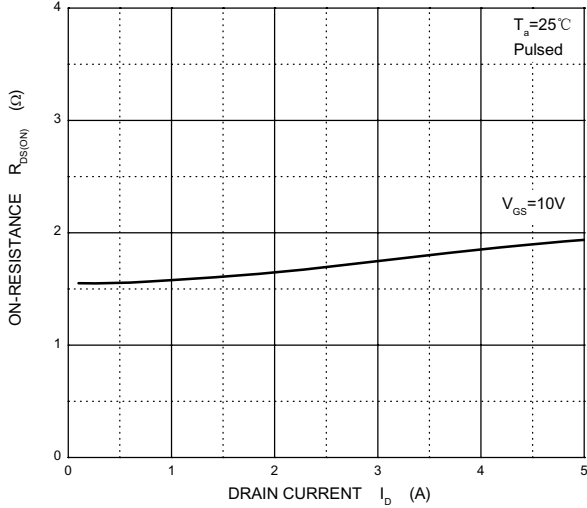
Output Characteristics



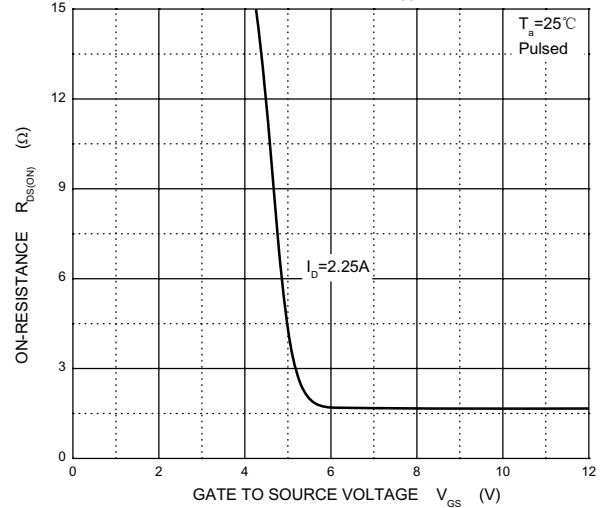
Transfer Characteristics



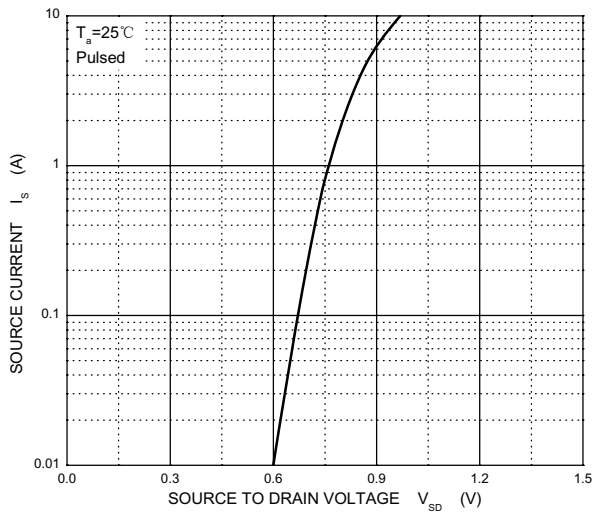
$R_{DS(ON)}$ — I_D



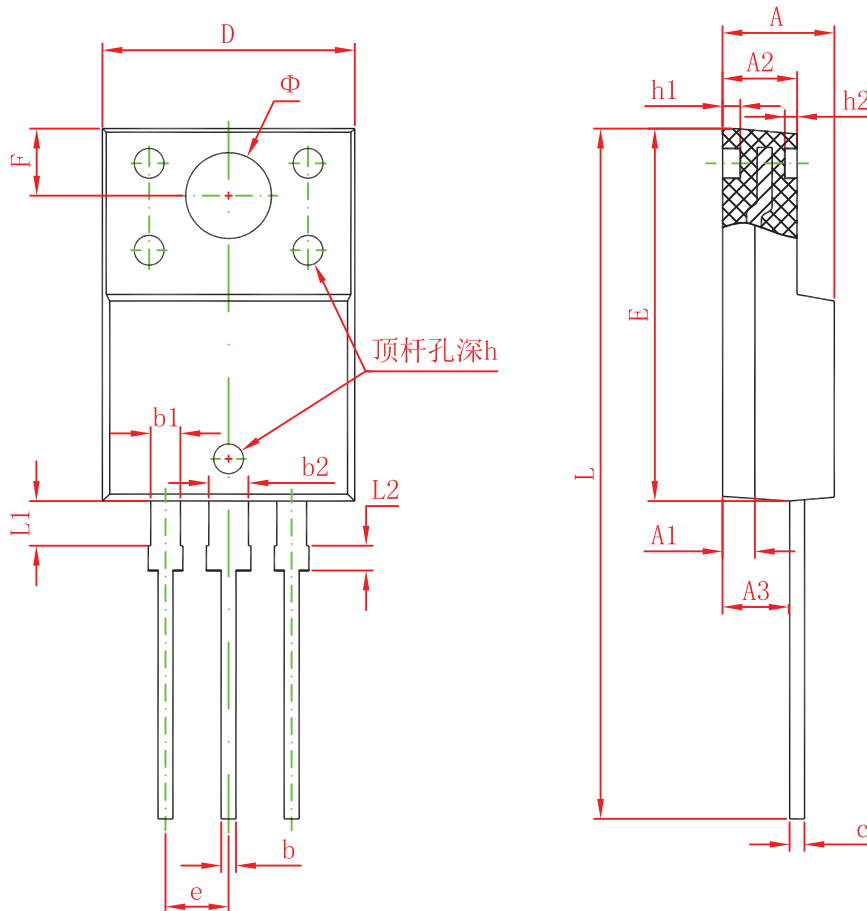
$R_{DS(ON)}$ — V_{GS}



I_S — V_{SD}



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