

Descriptions

This is 650V 12A N-Channel Enhancement MOSFET in a TO-220FPL Plastic Package

Features

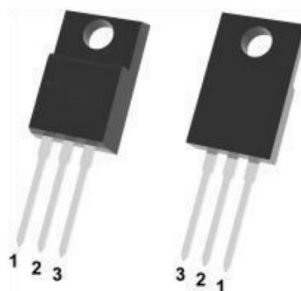
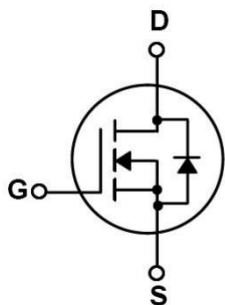
- LOW THERMAL RESISTANCE
- FAST SWITCHING
- HIGH INPUT RESISTANCE
- RoHS COMPLIANT

Parameter	Value	Unit
V_{DS}	650	V
$R_{DS(ON)MAX. V_{GS}=10V}$	1.25	Ω
I_D	12	A

Applications

- ELECTRONIC BALLAST
- ELECTRONIC TRANSFORMER
- SWITCH MODE POWER SUPPLY

Equivalent Circuit & Pinning



TO-220FPL

PIN1 : G

PIN 2 : D

PIN 3 : S

Absolute Maximum Ratings(Ta=25°C)

PARAMETER	SYMBOL	VALUE	UNIT
Drain-source Voltage	V_{DS}	650	V
gate-source Voltage	V_{GS}	± 30	V
Continuous Drain Current TC=25°C	I_D	12	A
Continuous Drain Current TC= 100°C	I_D	7.5	A
Drain Current — Pulsed①	I_{DM}	36	A
Total Power Dissipation①	P_{tot}	30	W
Junction Temperature	T_j	150	°C
Storage Temperature	T_{STG}	-55~150	°C
Single Pulse Avalanche Energy②	E_{AS}	676	mJ

Electrical Characteristics(Ta=25°C)

PARAMETER	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
Drain-source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	650			V
Breakdown Voltage Temperature Coefficient	$\Delta BV_{DSS}/\Delta T_j$	$I_D=250\mu A$, Referenced to 25°C		0.65		V/°C
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{GS}=V_{DS}, I_D=250\mu A$ ③	2		4	V
Drain-source Leakage Current	I_{DSS}	$V_{DS}=650V, V_{GS}=0V, T_j=25^\circ C$			1	μA
		$V_{DS}=520V, V_{GS}=0V, T_j=125^\circ C$			100	μA
Forward Transconductance	g_{FS}	$V_{DS}=15V, I_D=5A$ ③		6		S

Electrical Characteristics(Ta=25°C)

PARAMETER	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
Gate-body Leakage Current ($V_{DS} = 0$)	I_{GSS}	$V_{GS} = \pm 30V$			± 100	nA
Static Drain-source On Resistance	$R_{DS(ON)}$	$V_{GS} = 10V, I_D = 5A$ ③		0.95	1.25	Ω
Input Capacitance	C_{iss}	$V_{GS} = 0V, V_{DS} = 25V, F = 1.0MHz$		1422		pF
Output Capacitance	C_{oss}			145		
Reverse transfer Capacitance	C_{rss}			18		
Turn -On Delay Time	$T_{d(on)}$	$V_{DD} = 325V, I_D = 10A$ $R_G = 27\Omega$ ③		31		ns
Rise Time	T_r			33		
Turn -Off Delay Time	$T_{d(off)}$			76		
Fall Time	T_f			40		
Total Gate Charge	Q_g	$I_D = 5A, V_{DS} = 20V$ $V_{GS} = 10V$ ③		14		nC
Gate-to-Source Charge	Q_{gs}			3.3		
Gate-to-Drain Charge	Q_{gd}			5.0		
Continuous Diode Forward	I_S				12	A
Diode Forward Voltage	V_{SD}	$T_J = 25^\circ C, I_S = 10A$ $V_{GS} = 0V$ ③			1.4	V
Reverse Recovery Time	t_{rr}	$T_J = 25^\circ C, I_f = 10A, di/dt = 100A/\mu s$ ③		374		ns
Reverse Recovery Charge	Q_{rr}			4.7		μC

Thermal Characteristics

PARAMETER	SYMBOL	MAX	UNIT
Thermal Resistance Junction-case	R_{thJC}	4.17	$^\circ C/W$
Thermal Resistance Junction-ambient	R_{thJA}	62.5	$^\circ C/W$

Note:

- ① I_D & P_D base on maximum allowable junction temperature, test at $T_C = 25^\circ C$.
- ② Starting $T_J = 25^\circ C$, $V_{DD} = 50V$, $L = 8mH$, $R_G = 25\Omega$, $I_{AS} = 13A$.
- ③ Pulse Test : Pulse width $\leq 300\mu s$, Duty cycle $\leq 2\%$.

Electrical Characteristic Curve

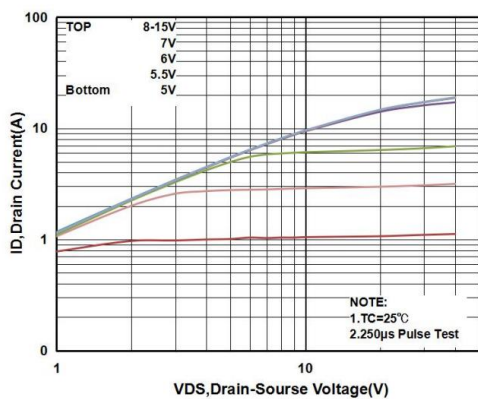


图 1 输出特性曲线

Fig1 Typical Output Characteristics

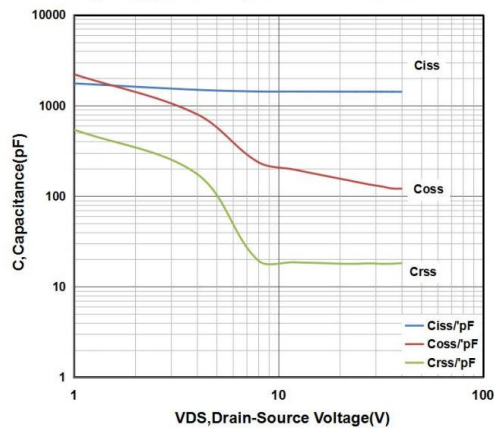


图 3 结电容曲线

Fig3 Capacitance Characteristics

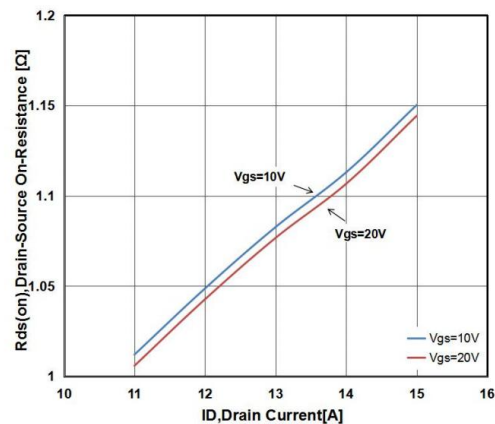


图 2 漏级电流与导通电阻曲线

Fig2 On-Resistance Vs. Drain Current and Gate Voltage

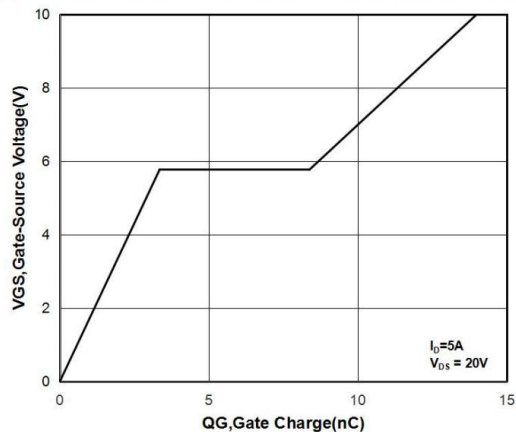


图 4 电荷曲线

Fig4 Gate Charge VS Gate to Source Voltage

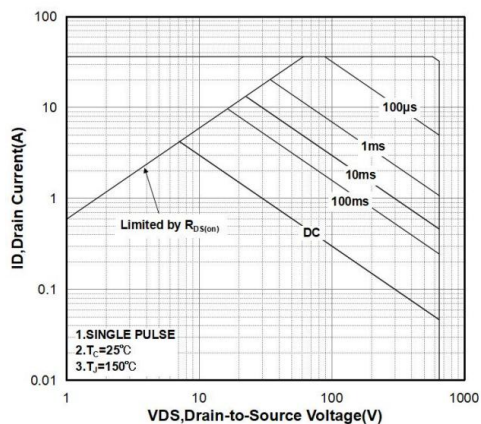


图 5 最大安全工作区曲线

Fig5 Maximum Safe Operating Area

Marking Instructions



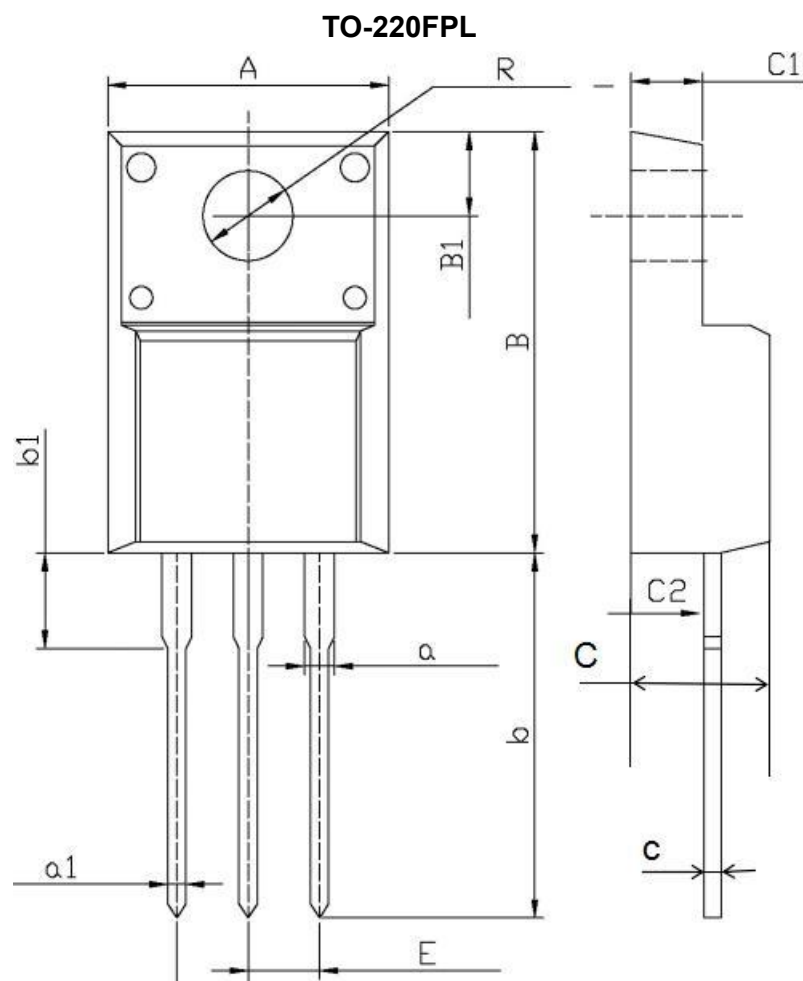
Note:
COT: Company Code
12N65: Product Type.
*****: *: Inner Code * : Year Code **: Week Code **: Lot Code.

Packaging SPEC

Tube

Part	Package	Marking	Packing method
CT12N65FP	TO-220FPL	12N65	Tube

Package Outline Dimensions



UNIT: mm

SYMBOL	min	nom	max	SYMBOL	min	nom	max
A	9.90		10.36	a	1.08		1.48
B	15.40		16.40	a1	0.70		0.90
B1	3.05		3.55	E	2.34		2.75
C	4.40		5.00	C1	2.25		2.85
c	0.40		0.60	C2	2.45		3.05
b	12.40		13.50	R	2.90		3.35
b1	2.60		3.60				⌀