Descriptions

This is 600V 12A N-CHANNEL MOSFET in a TO-220FL Plastic Package

Features

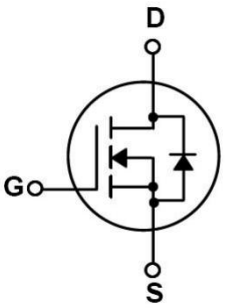
- Low gate charge
- low crss, fast switching

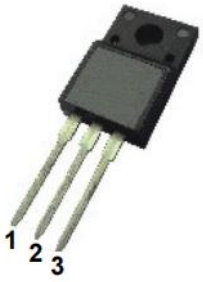
Parameter	Value	Unit
V_{DS}	600	V
$R_{DS(ON)MAX.}V_{GS}$=10V	0.65	Ω
I_D	12	A

Applications

- suited for high efficient switched mode power supplies
- active power factor correction
- electronic lamp ballast based on half bridge topology

Equivalent Circuit & Pinning





TO-220FL PIN1： G PIN 2： D PIN 3： S

Absolute Maximum Ratings(Ta=25℃)

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DSS}	600	V
Drain Current	I_D(Tc=25℃)	12	A
Drain Current	I_D(Tc=100℃)	7.4	A
Drain Current - Pulsed	I_{DM}	48	A
Gate-Source Voltage	V_{GSS}	±20	V
Single Pulsed Avalanche Energy	E_{AS}	870	mJ
Repetitive Avalanche Energy	E_{AR}	22.5	mJ
Avalanche Current	I_{AR}	12	A
Power Dissipation	P_D(Tc=25℃)	51	W
Operating and Storage Temperature Range	T_J,T_{STG}	-55 to 150	℃

Electrical Characteristics(Ta=25℃)

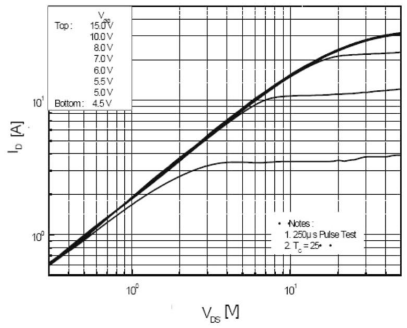
Parameter	Symbol	Test Conditions		Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V	I_D=250μA	600			V
Breakdown Voltage Temperature Coefficient	ΔB_{VDSS} / ΔT_J	I_D = 250μA			0.5		V/°C
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=600V	V_{GS}=0V			1	μA
		V_{DS}=480V	T_C=125℃			100	μA
Gate-Body Leakage Current Forward	I_{GSS}	V_{GS}=±20V	V_{DS}=0V			±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}	I_D=250μA	2		4	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS}=10V	I_D=6A		0.53	0.65	Ω
Forward Transconductance	g_{FS}	V_{DS}=40V	I_D=6A		13		S
Drain-Source Diode Forward Voltage	V_{SD}	V_{GS}=0V	I_S=12A			1.4	V

Electrical Characteristics(Ta=25℃)

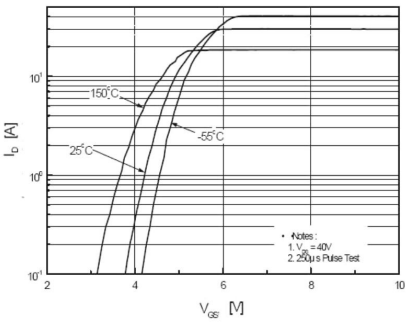
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Input Capacitance	C_{iss}	V_{DS}=25V V_{GS}=0V f=1MHz		1760	2290	pF
Output Capacitance	C_{oss}			182	235	pF
Reverse Transfer Capacitance	C_{rss}			21	28	pF
Turn-On Delay Time	$t_{d(on)}$	V_{DD}=300V I_D=12A R_G=25Ω		30	70	ns
Turn-On Rise Time	t_r			85	180	ns
Turn-Off Delay Time	$t_{d(off)}$			140	280	ns
Turn-Off Fall Time	t_f			90	190	ns
Total Gate Charge	Q_g	V_{DS} = 400V I_D = 12A V_{GS} = 10V		48	63	nC
Gate-Source Charge	Q_{gs}			8.5		nC
Gate-Drain Charge	Q_{gd}			21		nC
Maximum Continuous Drain-Source Diode Forward Current	IS				12	A
Maximum Pulsed Drain-Source Diode Forward Current	ISM				48	A
Reverse Recovery Time	trr	V_{GS} = 0V I_S = 12A dIF/dt =100A/μs		420		ns
Reverse Recovery Charge	Qrr			4.9		uC

Electrical Characteristic Curve

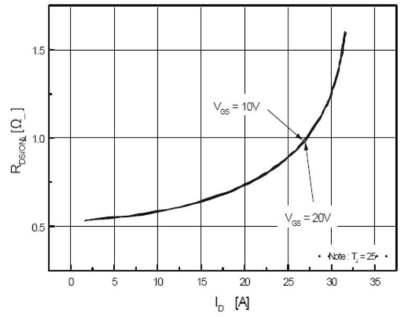
I_D — V_{DS}



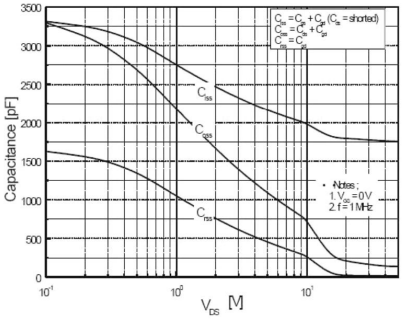
I_D — V_{GS}



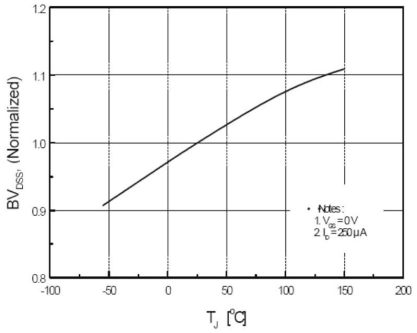
$R_{DS(ON)}$ — I_D



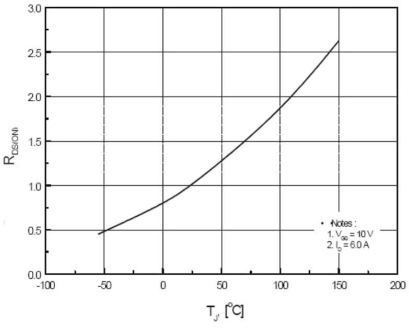
Capacitance — V_{DS}



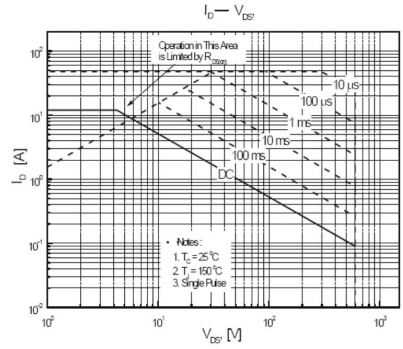
BV_{DSS} (Normalized) — T_J



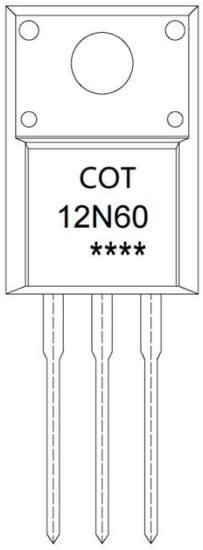
$R_{DS(ON)}$ — T_J



I_D — V_{DS}



Marking Instructions



Note:

COT: Company Code

12N60: Product Type.

****: Lot No. Code, code change with Lot No.

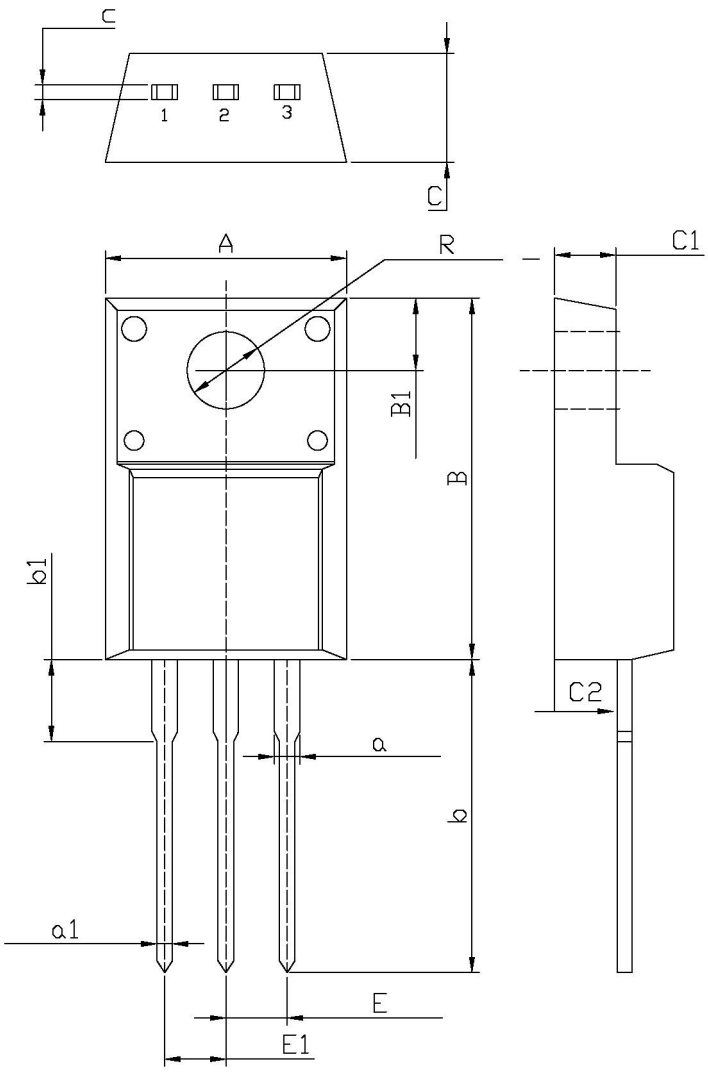
Packaging SPEC

TUBE

Package Type	Units					Dimension (unit: mm^3)		
	Units/Tube	Tubes/Inner Box	Units/Inner Box	Inner Boxes/Outer Box	Units/Outer Box	Tube	Inner Box	Outer Box
TO-220FL	50	20	1,000	5	5,000	532×33×7.0	555×164×50	575×290×180

Package Outline Dimensions

TO-220FL 单位：mm



Symbol	Dimensions In Millimeters		Symbol	Dimensions In Millimeters	
	Min	Max		Min	Max
C	4.5	4.9	b1	2.90	3.90
c	0.4	0.6	a	1.08	1.48
A	9.96	10.36	a1	0.70	0.90
B	15.67	16.07	E	2.34	2.74
B1	3.30	3.50	E1	2.34	2.74
R	3.08	3.28	C1	2.34	2.74
b	12.48	13.48	C2	2.56	2.96