

N-CHANNEL POWER MOSFET

Features

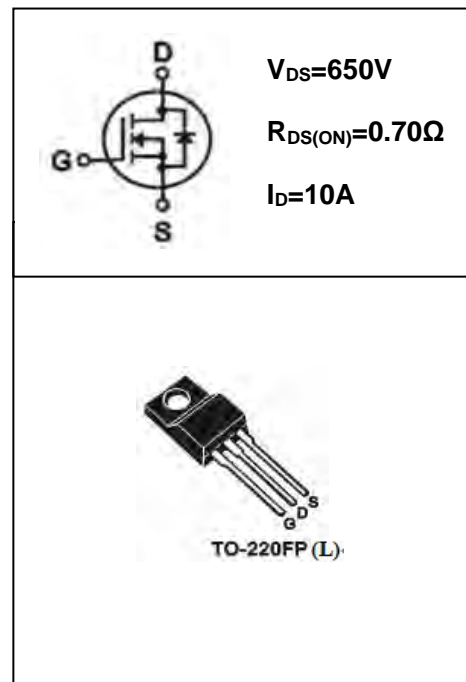
- LOW THERMAL RESISTANCE
- FAST SWITCHING
- HIGH INPUT RESISTANCE
- RoHS COMPLIANT

Applications

- ELECTRONIC BALLAST
- ELECTRONIC TRANSFORMER
- SWITCH MODE POWER SUPPLY

● Absolute Maximum Ratings (Tc=25°C) TO-220FP(L)

PARAMETER	SYMBOL	VALUE	UNIT
Drain-source Voltage	V _{DS}	650	V
gate-source Voltage	V _{GS}	± 20	V
Continuous Drain Current TC=25°C	I _D	10	A
Continuous Drain Current TC=100°C	I _D	6	A
Drain Current – Pulsed ①	I _{DM}	40	A
Power Dissipation	P _{tot}	TO-220FP(L):50	W
Junction Temperature	T _J	150	°C
Storage Temperature	T _{STG}	-55-150	°C
Single Pulse Avalanche Energy②	E _{AS}	600	mJ



● Electronic Characteristics (Tc=25°C)

PARAMETER	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
Drain-source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _D =250μA	650			V
Breakdown Voltage Temperature Coefficient	Δ BV _{DSS} /Δ T _J	I _D =250uA, Referenced to 25°C		0.65		V/°C
Gate Threshold Voltage	V _{GS(TH)}	V _{GS} =V _{DS} , I _D =250μA	2.0		4.0	V
Drain-source Leakage Current	I _{DSS}	V _{DS} =650V, V _{GS} =0V, T _J =25°C			1	μA
		V _{DS} =520V, V _{GS} =0V, T _J =125°C			10	μA
Forward Transconductance	g _{fs}	V _{DS} =15V, I _D =5.0A ③		12.8		S



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● Electrical Characteristics

PARAMETER	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
Gate-body Leakage Current ($V_{DS} = 0$)	I_{GSS}	$V_{GS} = \pm 20V$			± 100	nA
Static Drain-source On Resistance	$R_{DS(ON)}$	$V_{GS} = 10V, I_D = 5.0A$ ③		0.70	0.90	Ω
Input Capacitance	C_{iss}	$V_{GS} = 0V, V_{DS} = 25V$ $F = 1.0MHz$		1700		pF
Output Capacitance	C_{oss}			178		
Feedback Capacitance	C_{rss}			8		
Turn -Off Delay Time	$T_d(off)$	$V_{DD} = 325V, I_D = 10A$ $R_G = 25\Omega$ ③		50		ns
Total Gate Charge	Q_g	$I_D = 10A, V_{DS} = 520V$ $V_{GS} = 10V$ ③		37.2		nC
Gate-to-Source Charge	Q_{gs}			7.6		nC
Gate-to-Drain Charge	Q_{gd}			12.2		nC
Continuous Diode Forward Current	I_s				10	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		420		ns
Reverse Recovery Charge	Q_{rr}			4.2		μC

● Thermal Characteristics

PARAMETER	SYMBOL	MAX	UNIT
		TO-220FP(L)	
Thermal Resistance Junction-case	R_{thJC}	2.50	$^\circ C/W$
Thermal Resistance Junction-ambient	R_{thJA}	62.5	$^\circ C/W$

(Notes):

- ① Repetitive rating: Pulse width limited by maximum junction temperature
- ② Starting $T_j = 25^\circ C, V_{DD} = 50V, L = 12mH, R_G = 25\Omega, I_{AS} = 10A$
- ③ Pulse Test : Pulse width $\leq 300\mu s$, Duty cycle $\leq 2\%$

Typical Performance Characteristics

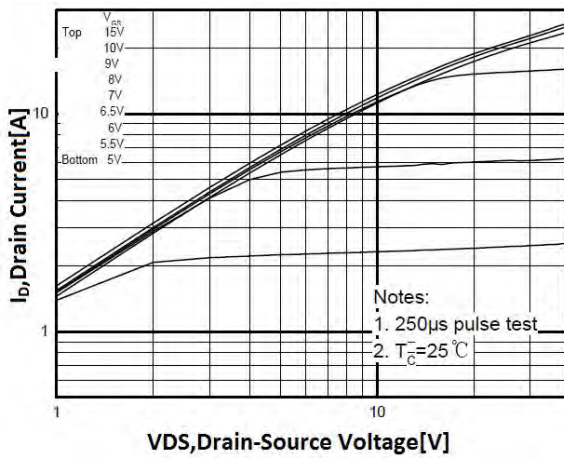


Fig1 Typical Output Characteristics, $T_c = 25^\circ\text{C}$

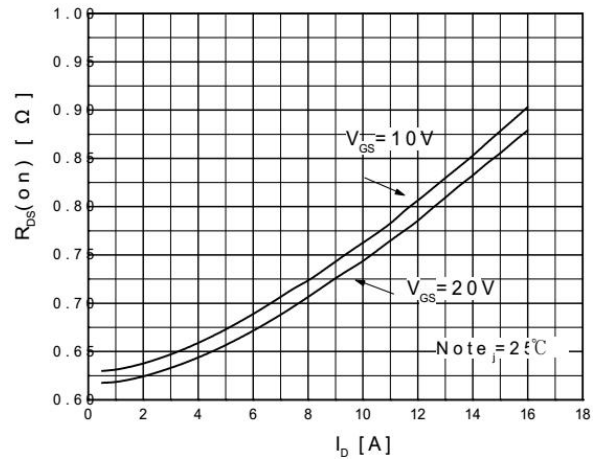


Fig2 On-Resistance V.s. Drain Current and Gate Voltage

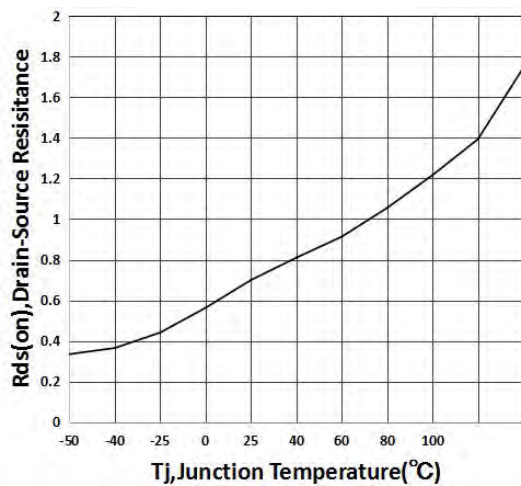


Fig3 Normalized On-Resistance V.s. Temperature

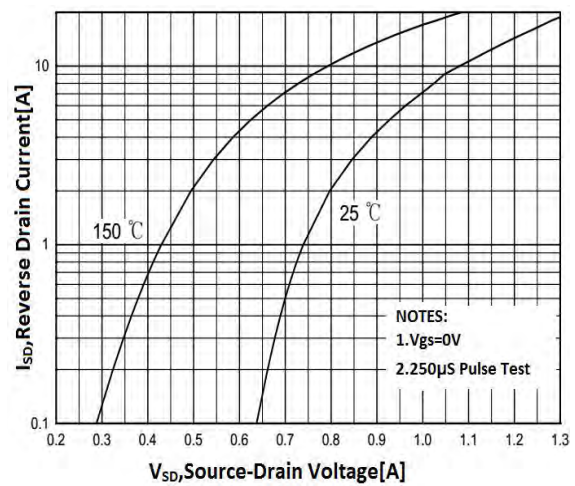


Fig4 Typical Source-Drain Diode Forward Voltage

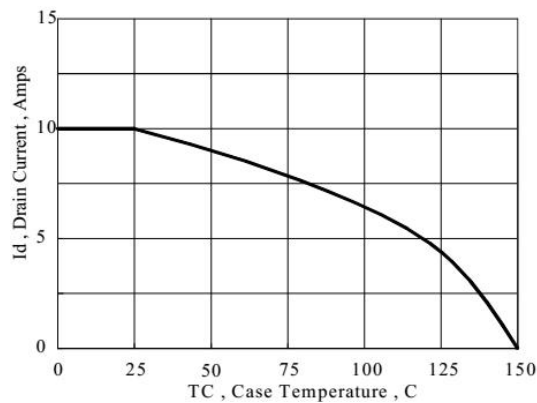


Fig5 Maximum Drain Current V.s. Case Temperature

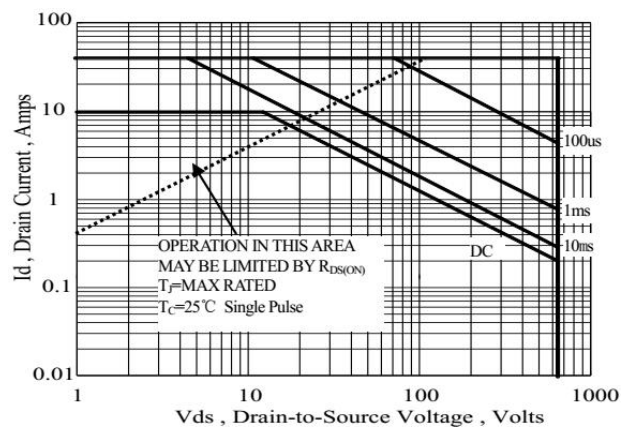


Fig6 Maximum Safe Operating Area

TO-220FPL MECHANICAL DATA

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	2.90		3.90				

