N-CHANNEL POWER MOSFET

●FEATURES

LOW THERMAL RESISTANCE
FAST SWITCHING
HIGH INPUT RESISTANCE
RoHS COMPLIANT

●APPLICATION

ELECTRONIC BALLAST
ELECTRONIC TRANSFORMER
SWITCH MODEPOWERSUPPLY

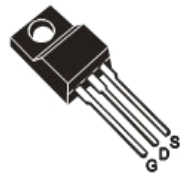
●Absolute Maximum Ratings （Tc=25°C）

PARAMETER	SYMBOL	VALUE	UNIT
Drain-source Voltage	V_{DS}	650	V
gate-source Voltage	V_{GS}	± 30	V
Continuous Drain Current TC=25℃	I_D	7.0	A
Continuous Drain Current TC=100℃	I_D	3.2	A
Drain Current －Pulsed ①	I_{DM}	28	A
Power Dissipation	P_{tot}	TO-220F:40	W
Junction Temperature	Tj	150	°C
Storage Temperature	T_{STG}	-55-150	°C
Single Pulse Avalanche Energy ②	E_{AS}	230	mJ

V_{DS}=650V

$R_{DS(ON)}$=1.4Ω

I_D=7.0A



TO-220F

●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 Tj	I_D=250uA, Referenced to 25°C		0.8		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, Tj=25°C			1	μA
		V_{DS} =520V, V_{GS} =0V, Tj=125°C			10	μA
Forward Transconductance	gfs	V_{DS} =40V, I_D=3.5A ③		3.0		S

●Electrical Characteristics

PARAMETER	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
Gate-body Leakage Current (V_{DS} = 0)	I_{GSS}	V_{GS} =±30V			±100	nA
Static Drain-source On Resistance	$R_{DS(ON)}$	V_{GS} =10V, I_D=3.5A ③		1.1	1.4	Ω
Input Capacitance	Ciss	V_{GS} = 0V, V_{DS} = 25V F = 1.0MHZ		955		pF
Turn -Off Delay Time	Td(off)	V_{DD}=325V, I_D =7.0A R_G=25Ω ③		90		ns
Total Gate Charge	Qg	I_D =7.0A, V_{DS} = 520V V_{GS} = 10V ③		28		nC
Gate-to-Source Charge	Qgs			7		nC
Gate-to-Drain Charge	Qgd			12		nC
Continuous Diode Forward Current	I_S				7.0	A
Diode Forward Voltage	V_{SD}	Tj=25°C, Is=7.0A V_{GS} =0V ③			1.4	V
Reverse Recovery Time	trr	Tj=25°C, If=7.0A di/dt=100A/μs ③		400		ns
Reverse Recovery Charge	Qrr			3.3		uC

●Thermal Characteristics

PARAMETER	SYMBOL	MAX	UNIT
		TO-220F	
Thermal Resistance Junction-case	Rth_{JC}	3.13	℃/W
Thermal Resistance Junction-ambient	Rth_{JA}	62.5	℃/W

(Notes)

① Repetitive rating: Pulse width limited by maximum junction temperature

② Starting Tj=25°C, V_{DD} =50V, L=10mH, R_G =25Ω, I_{AS}=7.0A

③ Pulse Test : Pulse width ≤ 300μs, Duty cycle ≤ 2%

● Typical Characteristics

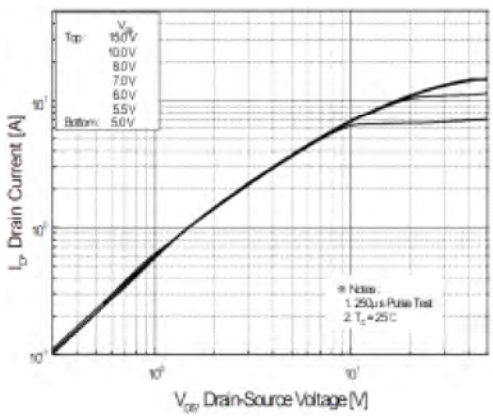


Fig.1 Typical Output Characteristics, Tc=25℃

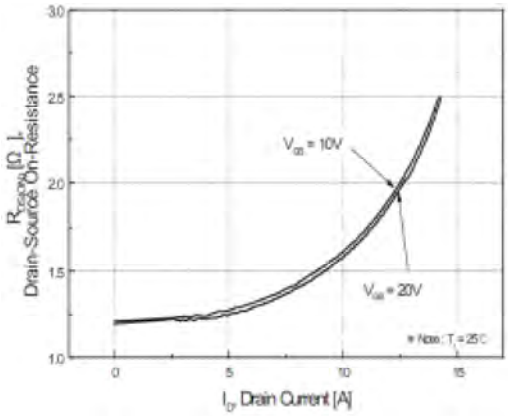


Fig.2 On-Resistance Vs.Drain Current and Gate Voltage

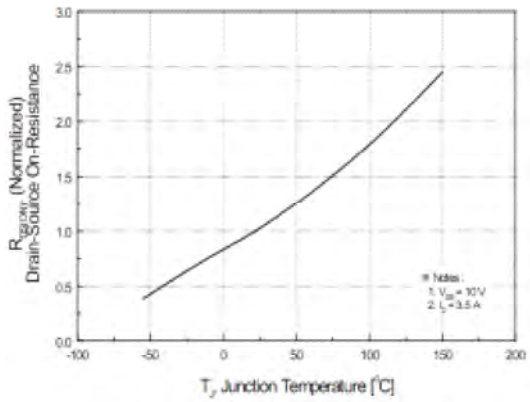


Fig.3 Normalized On-Resistance Vs.Temperature

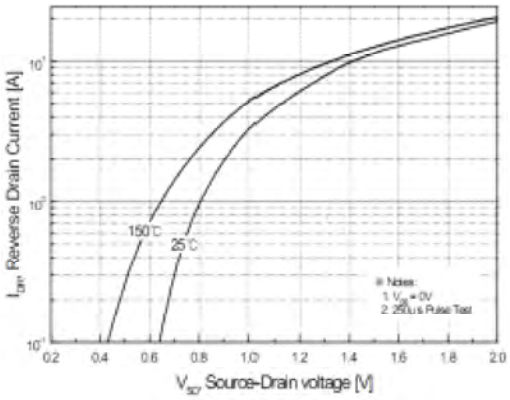


Fig.4 Typical Source-Drain Diode Forward Voltage

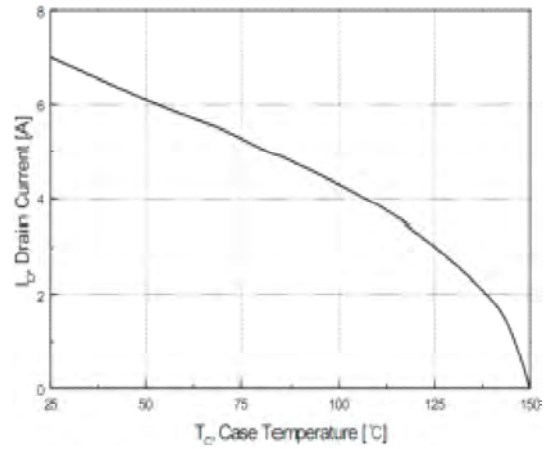


Fig.5 Maximum Drain Current Vs.Case Temperature

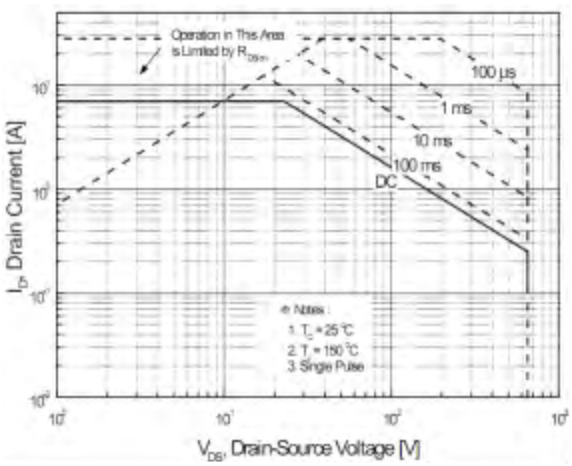


Fig.6 Maximum Safe Operating Area

TO-220F MECHANICAL DATA

UNIT：mm

SYMBOL	min	nom	max	SYMBOL	min	nom	max
A	4.40		4.95	e		2.54	
A_1	2.30		2.90	L	12.50		14.30
b	0.45		0.90	L_1	9.10		10.05
b_1	1.10		1.70	L_2	15.00		16.00
c	0.35		0.90	L_3	3.00		4.00
D	14.50		17.00	øp	3.00		3.50
D1	6.10		9.00	Q	2.30		2.80
E	9.60		10.30