N-CHANNEL POWER MOSFET

●FEATURES

LOW ON-RESISTANCE
FAST SWITCHING
HIGH INPUT RESISTANCE
RoHS COMPLIANT

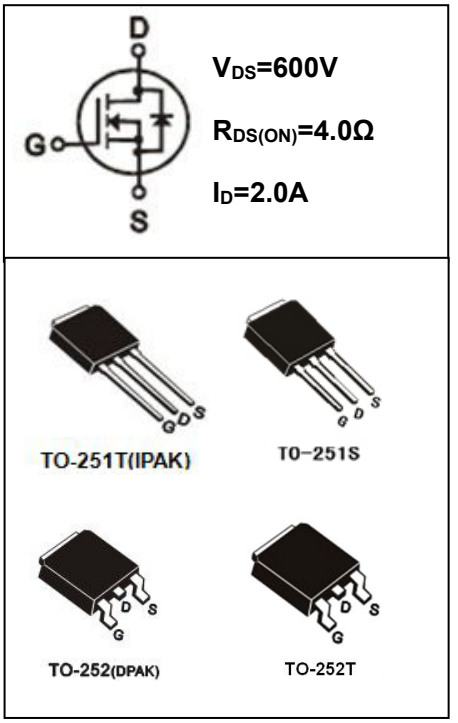
●APPLICATION

ELECTRONIC BALLAST
ELECTRONIC TRANSFORMER
SWITCH MODEPOWERSUPPLY

●Absolute Maximum Ratings （Tc=25°C）

PARAMETER	SYMBOL	VALUE	UNIT
Drain-source Voltage	V_{DS}	600	V
gate-source Voltage	V_{GS}	± 30	V
Continuous Drain Current TC=25℃	I_D	2.0*	A
Continuous Drain Current TC=100℃	I_D	1.25*	A
Drain Current －Pulsed ①	I_{DM}	8.0*	A
Power Dissipation	P_{tot}	44	W
Junction Temperature	Tj	150	°C
Storage Temperature	T_{STG}	-55-150	°C
Single Pulse Avalanche Energy ②	E_{AS}	120	mJ

*Drain current limited by maximum junction temperature



●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	600			V
Breakdown Voltage Temperature Coefficient	Δ BV_{DSS}/ Δ Tj	I_D=250uA, Referenced to 25°C		0.6		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} =600V, V_{GS} =0V, Tj=25°C			25	μA
		V_{DS} =480V, V_{GS} =0V, Tj=125°C			250	μA
Forward Transconductance	gfs	V_{DS} =40V, I_D=1A ③		1.5		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=1A ③		4.0	4.5	Ω
Input Capacitance	Ciss	V_{GS} = 0V, V_{DS} = 25V F = 1.0MHZ		295		pF
Turn -Off Delay Time	Td(off)	V_{DD}=300V, I_D =2.0A R_G=25Ω ③		24		ns
Total Gate Charge	Qg	I_D =2.0A, V_{DS} = 480V V_{GS} = 10V ③		6.8		nC
Gate-to-Source Charge	Qgs			2.0		nC
Gate-to-Drain Charge	Qgd			1.8		nC
Continuous Diode Forward Current	I_S				2.0	A
Diode Forward Voltage	V_{SD}	Tj=25°C, Is=2.0A V_{GS} =0V ③			1.4	V
Reverse Recovery Time	trr	Tj=25°C,If=2.0A di/dt=100A/μs ③		380		ns
Reverse Recovery Charge	Qrr			0.9		uC

●Thermal Characteristics

PARAMETER	SYMBOL	MAX	UNIT
		TO-251T/251S/252/252T	
Thermal Resistance Junction-case	Rth_{JC}	2.87	℃/W
Thermal Resistance Junction-ambient	Rth_{JA}	110.0	℃/W

Notes

① Repetitive rating: Pulse width limited by maximum junction temperature

② Starting Tj=25°C, V_{DD} =50V, L=56mH, R_G =25Ω, I_{AS}=2.0A

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

● Typical Characteristics

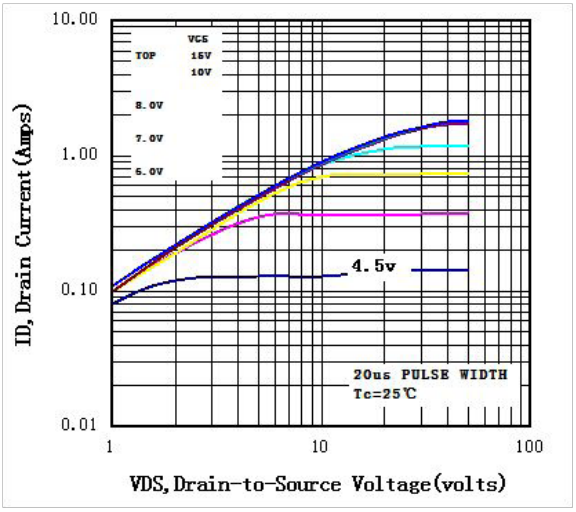


Fig1 Typical Output Characteristics, Tc=25℃

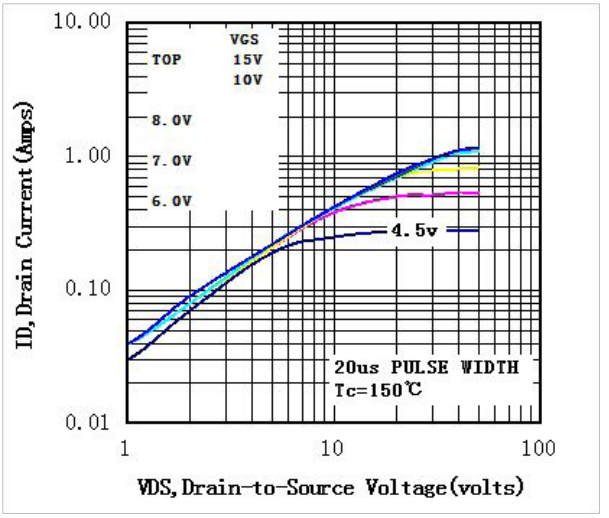


Fig2 Typical Output Characteristics, Tc=150℃

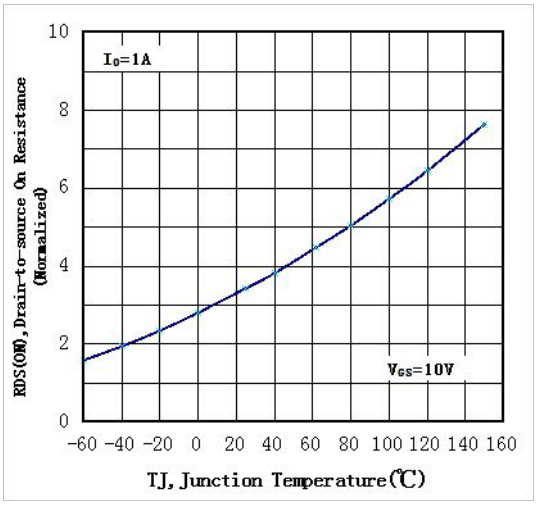


Fig3 Normalized Resistance Vs. Temperature

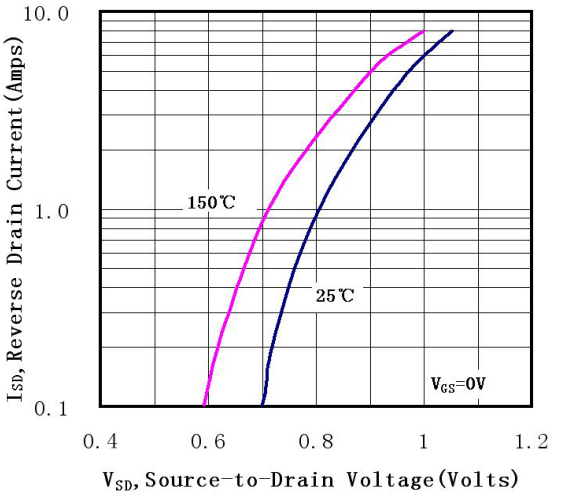


Fig4 Typical Source-Drain Diode Forward Voltage

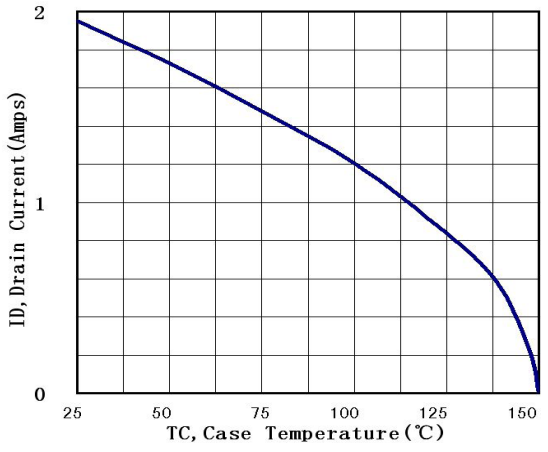


Fig5 Maximum Drain Current Vs. Case Temperature

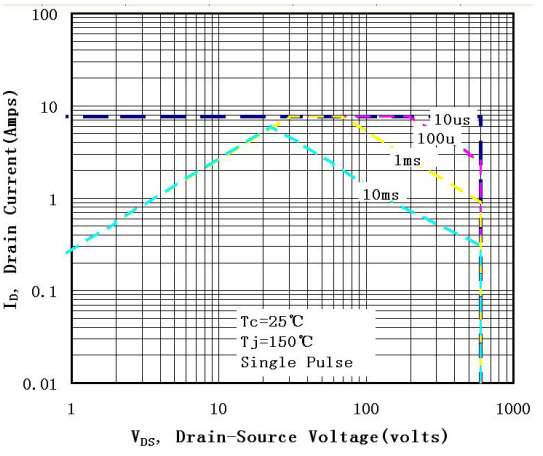


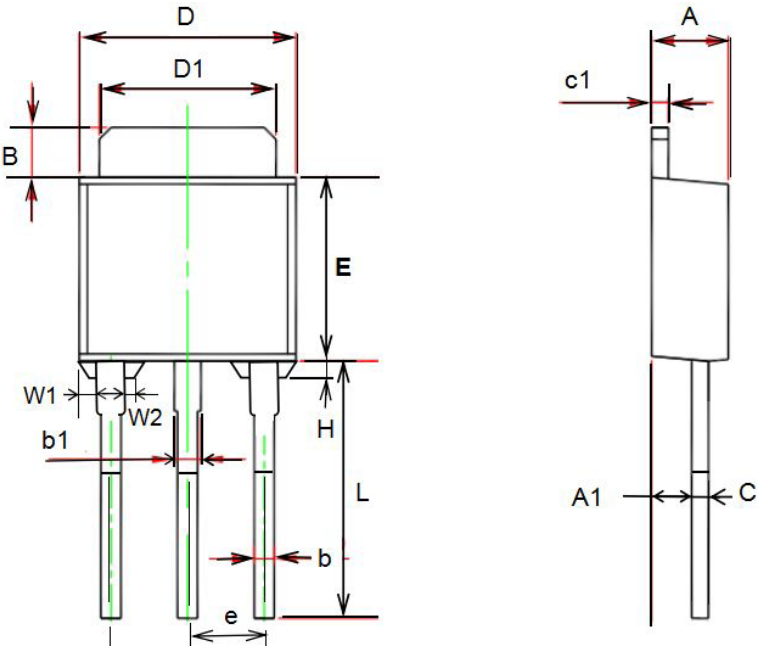
Fig6 Maximum Safe Operating Area

TO-251T (IPAK) MECHANICAL DATA

UNIT：mm

SYMBOL	min	nom	max
A	2.10		2.50
A_1	0.95		1.30
B	0.80		1.25
b	0.50		0.80
b_1	0.70		0.80
c	0.45		0.70
c1	0.45		0.70
D	6.35		6.80
D_1	5.10		5.50
E	5.30		6.30
e	2.25	2.30	2.35
L	7.00		9.20
H	0.35		0.45
W1	0.30		0.50
W2	0.20		0.40

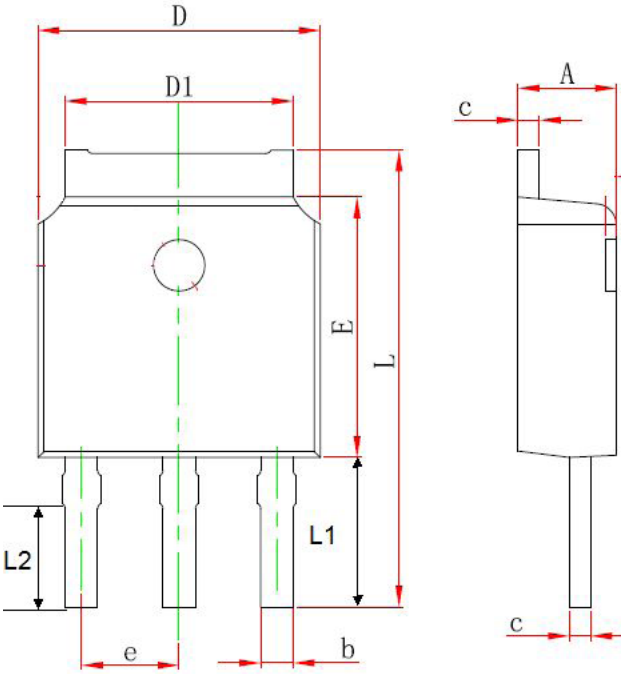
[S/L]



TO-251S (IPAK) MECHANICAL DATA

UNIT：mm

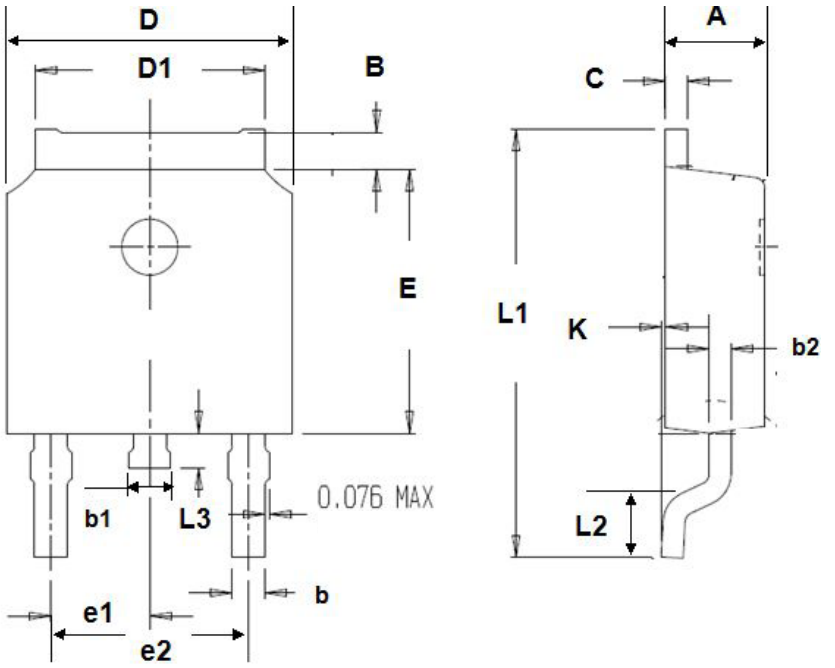
SYMBOL	min	nom	max
A	2.20		2.40
b	0.50		0.85
C	0.45	0.50	0.60
D	6.50		6.70
D1	5.10		5.50
E	5.9		6.20
e	2.18	2.29	2.38
L	11.00		12.40
L1	4.8		5.3
L2	3.5		4.2



TO-252 MECHANICAL DATA

UNIT：mm

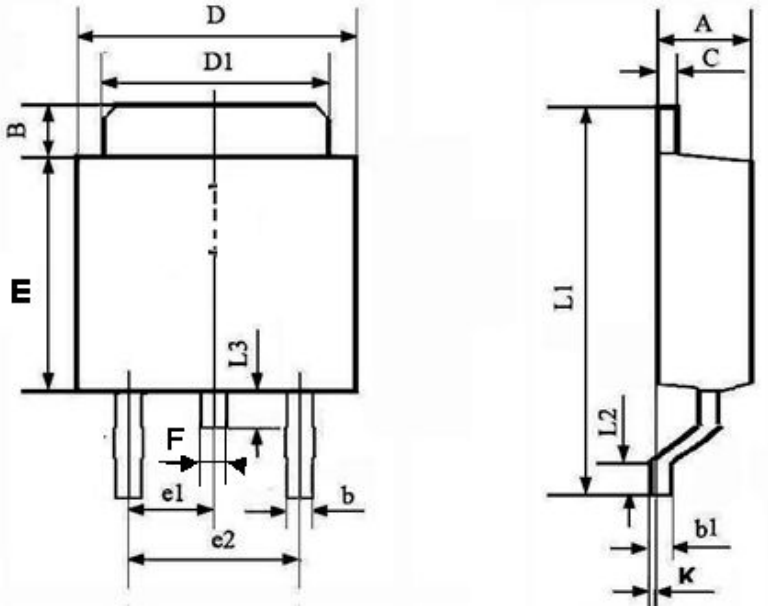
SYMBOL	min	max	SYMBOL	min	max
A	2.10	2.50	B	0.85	1.25
b	0.50	0.80	b1	0.70	1.20
b2	0.45	0.70	C	0.45	0.70
D	6.30	6.75	D1	5.10	5.50
E	5.30	6.30	e1	2.25	2.35
L1	9.20	10.60	e2	4.45	4.75
L2	0.90	1.75	L3	0.60	1.10
K	0.00	0.23			



TO-252T MECHANICAL DATA

UNIT ： mm

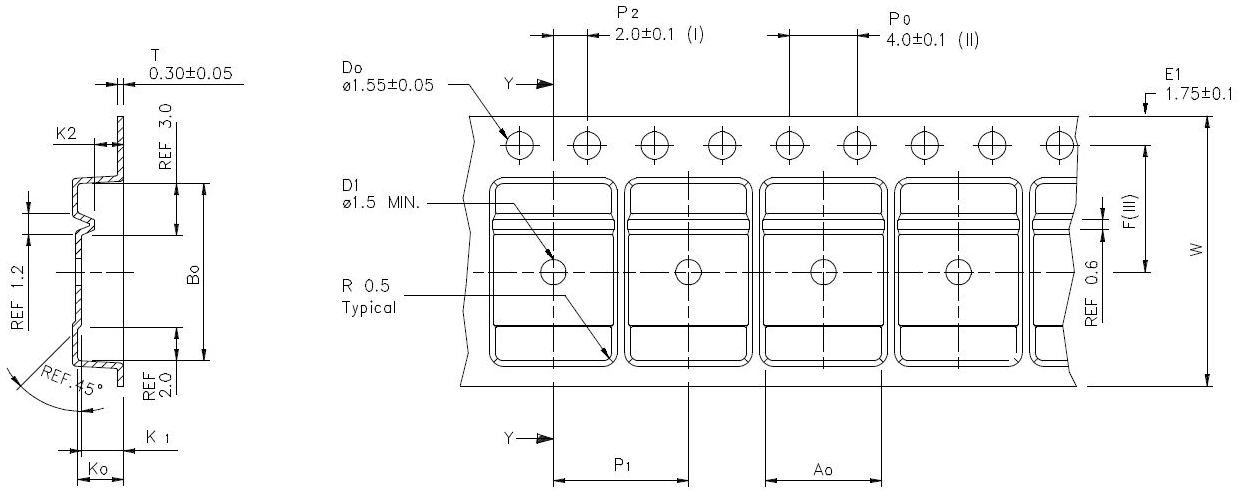
SYMBOL	min	max	SYMBOL	min	max
A	2.20	2.40	B	0.85	1.25
b	0.50	0.80	C	0.45	0.70
b1	0.45	0.70	D	6.30	6.70
D1	5.10	5.50	E	5.30	6.20
L1	9.20	10.60	F	0.50	0.90
L2	0.90	1.50	e1	2.25	2.35
L3	0.60	1.10	e2	4.50	4.70
			K	0.00	0.18

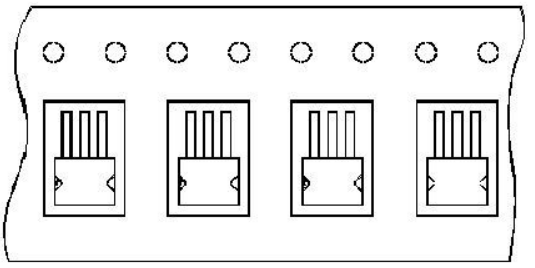


TO-252 TAPE AND REEL DATA

UNIT：mm

SYMBOL	min	nom	max	SYMBOL	min	nom	max
A0	6.80	6.90	7.00	B0	10.40	10.50	10.60
K0	2.60	2.70	2.90	K1	2.40	2.50	2.60
F	7.40	7.50	7.60	K2	1.60	1.70	1.80
W	15.90	16.00	16.10	P1	7.90	8.00	8.10





UNIT ORIENTATION