

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
650V	2.6Ω@10V	4A

Feature

- Avalanche energy tested
- Low gate charge
- Fast switching capability

Application

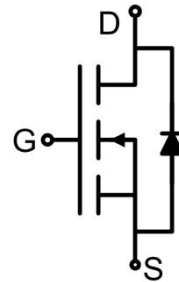
- Power factor correction
- Switched mode power supplies
- Uninterruptible power supply

Package



TO-251AB

Circuit diagram



Marking



Absolute maximum ratings (Ta=25°C unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V _{DS}	650	V
Gate-Source Voltage	V _{GS}	±30	V
Continuous Drain Current	I _D	4	A
Continuous Drain Current (100°C)	I _D (100°C)	2.5	A
Pulsed Drain Current	I _{DM}	16	A
Power Dissipation	P _D	54	W
Thermal Resistance, Junction-to-Ambient	R _{θJA}	63	°C/W
Thermal Resistance, Junction-to-Case	R _{θJC}	2.31	°C/W
Single pulse avalanche energy	E _{AS}	173	mJ
Junction Temperature	T _J	150	°C
Storage Temperature	T _{STG}	-55 ~ +150	°C

Electrical characteristics (T_A=25 °C, unless otherwise noted)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-source breakdown voltage	V _{(BR)DSS}	V _{GS} = 0V, I _D = 250μA	650			V
Zero gate voltage drain current	I _{DSS}	V _{DS} = 650V, V _{GS} = 0V			1	μA
Gate-body leakage current	I _{GSS}	V _{GS} = ±30V, V _{DS} = 0V			±100	nA
Gate threshold voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250μA	2.0		4.0	V
Drain-source on-resistance ¹⁾	R _{DS(on)}	V _{GS} = 10V, I _D = 2A		2.36	2.6	Ω
Dynamic characteristics²⁾						
Input Capacitance	C _{iss}	V _{DS} = 25V, V _{GS} = 0V, f = 1MHz		560		pF
Output Capacitance	C _{oss}			55		
Reverse Transfer Capacitance	C _{rss}			10		
Total Gate Charge	Q _g	V _{DS} = 520V, V _{GS} = 10V, I _D = 4A I _G = 1mA		13		nC
Gate-Source Charge	Q _{gs}			4		
Gate-Drain Charge	Q _{gd}			2.2		
Turn-on delay time	t _{d(on)}	V _{DD} = 100V, V _{GS} = 10V, I _D = 4A, R _{GEN} = 25Ω		7		nS
Turn-on rise time	t _r			16		
Turn-off delay time	t _{d(off)}			36		
Turn-off fall time	t _f			22		
Source-Drain Diode characteristics						
Diode Forward Current	I _S				4	A
Diode Forward voltage ¹⁾	V _{DS}	V _{GS} = 0V, I _S = 4A			1.4	V
Reverse Recovery Time	t _{rr}	T _J = 25°C, I _F = 4A di/dt = 100A/μs ¹⁾		250		nS
Reverse Recovery Charge	Q _{rr}				4.5	

Notes:

1) Pulse Test: Pulse Width < 300μs, Duty Cycle ≤2%.

2) Guaranteed by design, not subject to production testing.

Typical Characteristics

Fig.1 Drain Current vs. Gate-Source Voltage

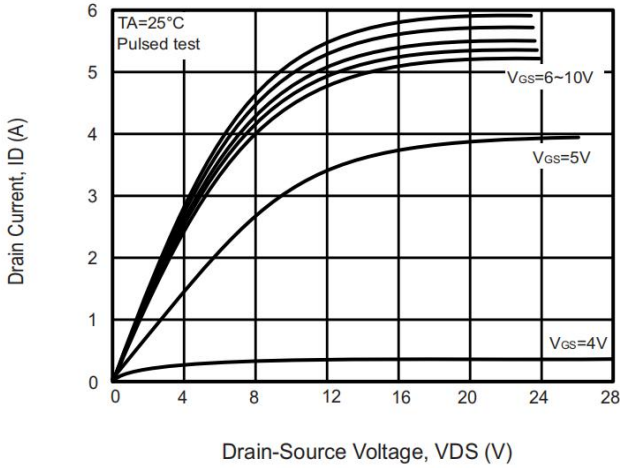


Fig.2 Drain-Source On-Resistance vs. Gate-Source Voltage

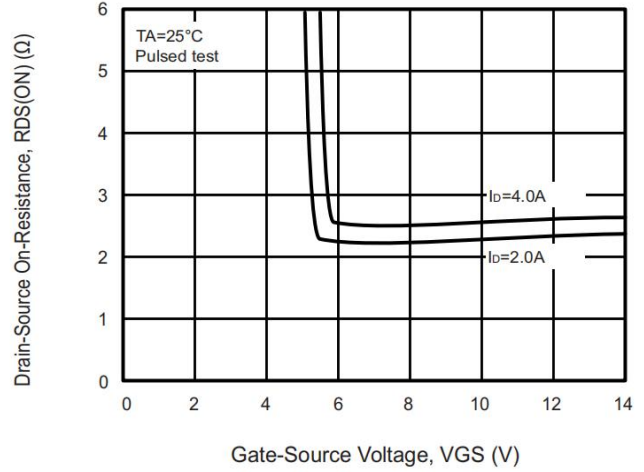


Fig.3 Gate Charge Characteristics

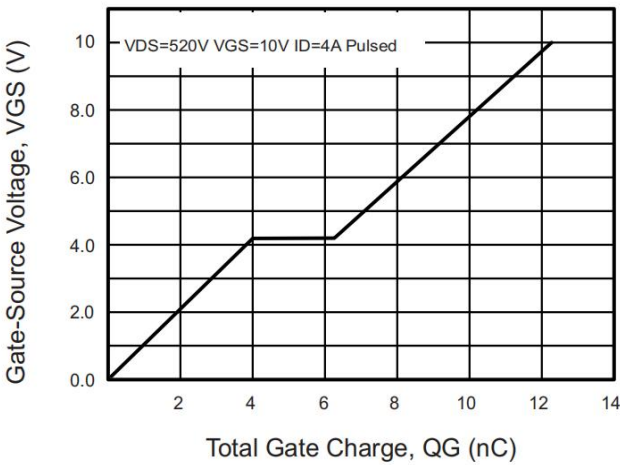


Fig.4 Capacitance Characteristics

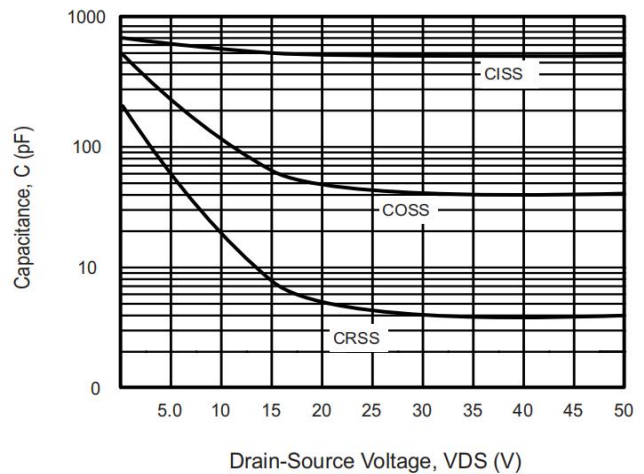


Fig.5 Drain-Source On-Resistance vs. Junction Temperature

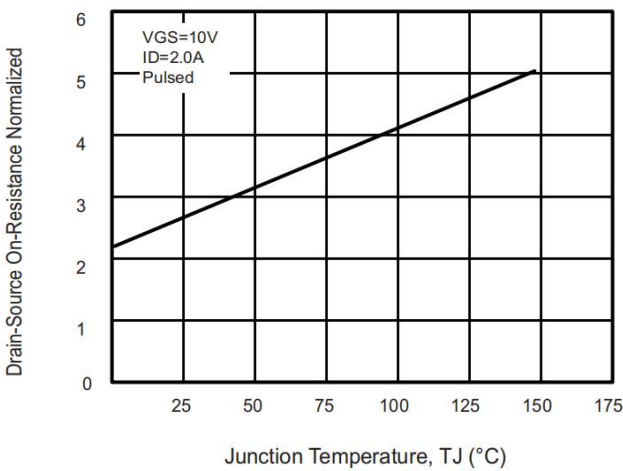
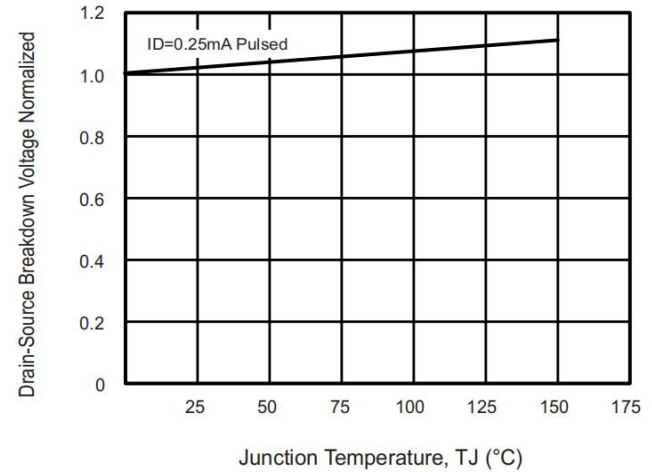


Fig.6 Breakdown Voltage vs. Junction Temperature



Typical Characteristics

Fig.7 Gate Threshold Voltage vs. Junction Temperature

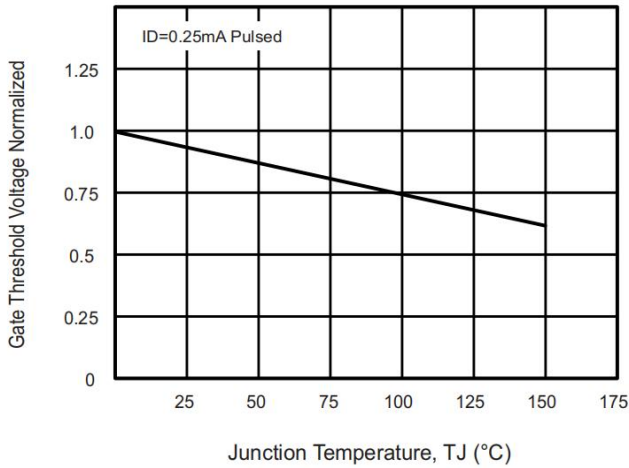


Fig.8 Source Current vs. Source-Drain Voltage

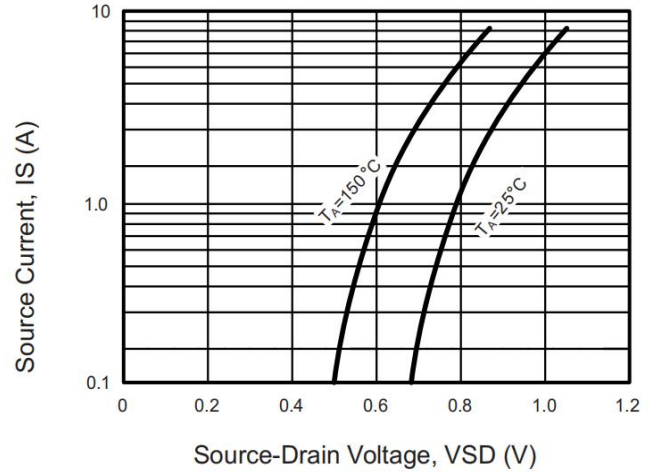


Fig.9 Drain Current vs. Gate-Source Voltage

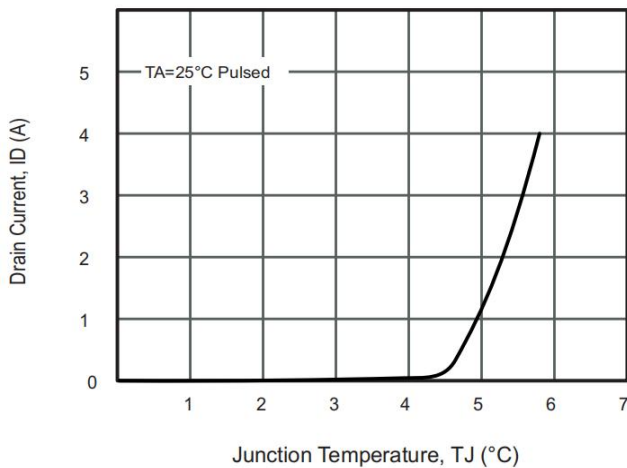


Fig.10 Drain-Source On-Resistance vs. Drain Current

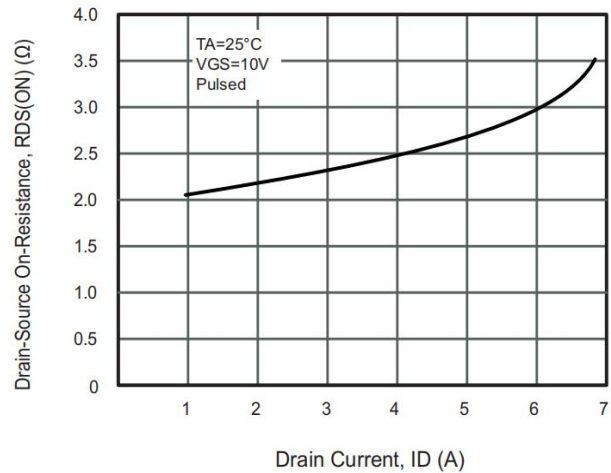


Fig.11 Drain Current vs. Junction Temperature

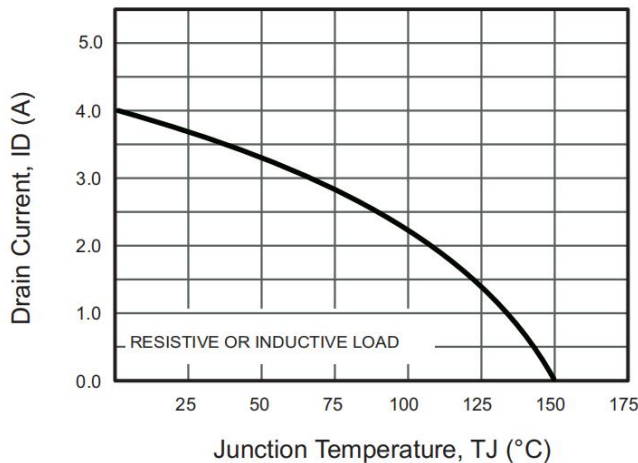
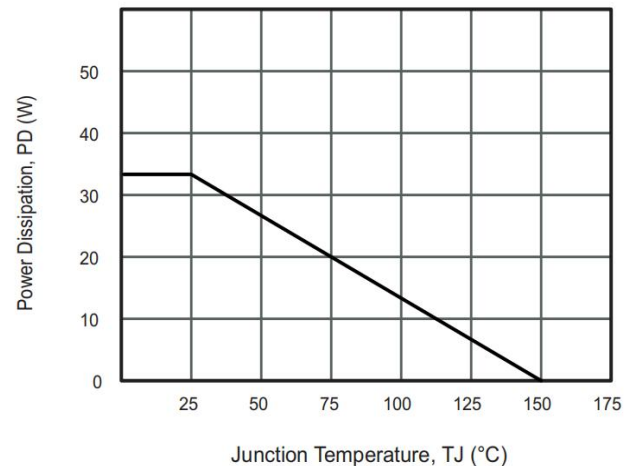
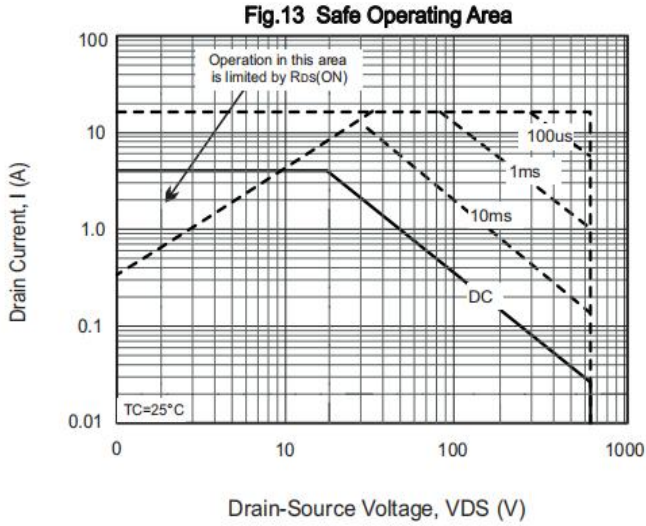


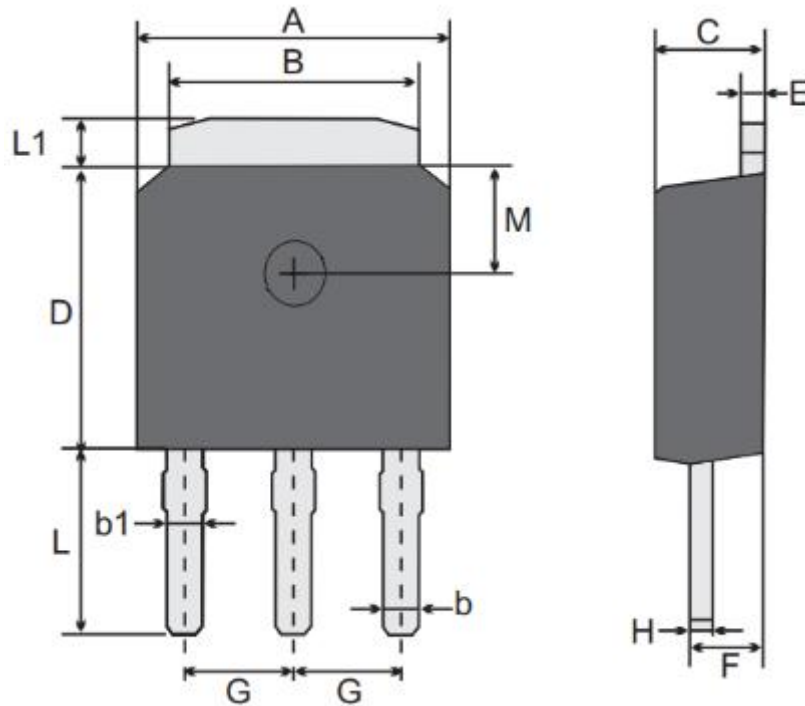
Fig.12 Power Dissipation vs. Junction Temperature



Typical Characteristics



TO-251AB Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	6.300	6.700	0.248	0.264
B	5.100	5.500	0.201	0.217
b	0.300	0.800	0.012	0.031
b1	0.760	0.900	0.030	0.035
C	2.100	2.500	0.083	0.098
D	5.900	6.300	0.232	0.248
E	0.400	0.600	0.016	0.024
F	1.300	1.800	0.051	0.071
G	2.290 TYP.		0.090 TYP.	
H	0.450	0.600	0.018	0.024
L	3.500	4.500	0.138	0.177
L1	0.800	1.250	0.031	0.049
M	1.800 TYP.		0.070 TYP.	