

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
60V	16mΩ@10V	58A

Feature

- Advanced trench technology
- Excellent $R_{DS(on)}$
- Low gate charge

Application

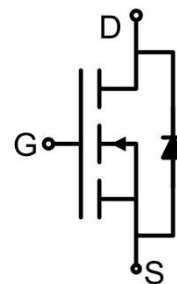
- Battery protection
- Load switch
- Uninterruptible power supply

Package



TO-220AB

Circuit diagram



Marking



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

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V _{DS}	60	V
Gate-Source Voltage	V _{GS}	±20	V
Continuous Drain Current ¹⁾ (V _{GS} =10V)	I _D	58	A
Continuous Drain Current ¹⁾ (V _{GS} =10V, T _c =70°C)	I _D (100°C)	30	A
Pulsed Drain Current ²⁾	I _{DM}	90	A
Power Dissipation ⁴⁾	P _D	45	W
Thermal Resistance, Junction-to-Case ¹⁾	R _{θJC}	2.8	°C/W
Single pulse avalanche energy ³⁾	E _{AS}	392	mJ
Junction Temperature	T _J	150	°C
Storage Temperature	T _{STG}	-55 ~ +150	°C

Electrical characteristics (T_J=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	60			V
Zero gate voltage drain current	I _{DSS}	V _{DS} =60V, V _{GS} =0V			1	μA
Gate-body leakage current	I _{GSS}	V _{GS} =±20V, V _{DS} =0V			±100	nA
Gate threshold voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	2	3	4	V
Drain-source on-resistance	R _{DS(on)}	V _{GS} =10V, I _D =20A		11	16	mΩ
Dynamic characteristics ⁵⁾						
Input Capacitance	C _{iss}	V _{DS} =15V, V _{GS} =0V, f =1MHz		2286		pF
Output Capacitance	C _{oss}			172		
Reverse Transfer Capacitance	C _{rss}			53		
Total Gate Charge	Q _g	V _{DD} =48V, V _{GS} =10V, I _D =50A		37.1		nC
Total Gate Charge	Q _g	V _{DD} =48V, V _{GS} =4.5V, I _D =50A		10.9		
Gate-Source Charge	Q _{gs}			14.3		
Gate-Drain Charge	Q _{gd}			8.3		
Turn-on delay time	t _{d(on)}	V _{DS} =30V, V _{GS} =10V, I _D =1A, R _G =3.6Ω, R _L =30Ω		27.7		nS
Turn-on rise time	t _r			5.1		
Turn-off delay time	t _{d(off)}			54.2		
Turn-off fall time	t _f			5.5		
Source-Drain Diode characteristics						
Diode Continuous Current	I _S				58	A
Diode Forward voltage	V _{SD}	V _{GS} =0V, I _S =50A			1.2	V

Notes:

- 1) The data tested by surface mounted on a 1 inch² FR-4 board with 20Z copper.
- 2) The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2%.
- 3) The EAS data shows Max. rating . The test condition is VDD=25V, VGS=10V, L=0.1mH, IAS=38A
- 4) The power dissipation is limited by 150°C junction temperature.
- 5) Guaranteed by design, not subject to production testing.

Typical Characteristics

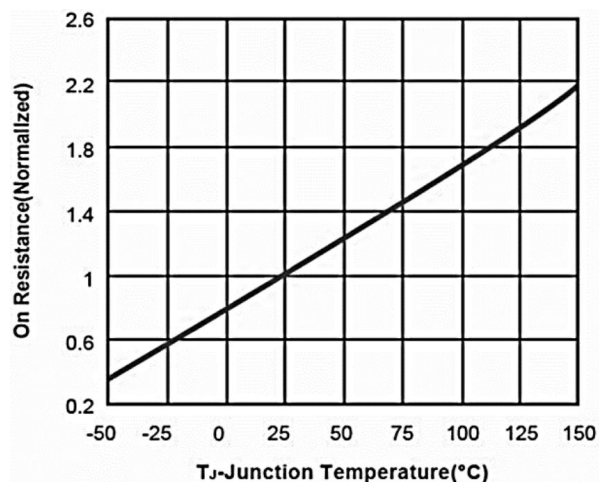


Figure.1 On Resistance Vs Junction Temperature

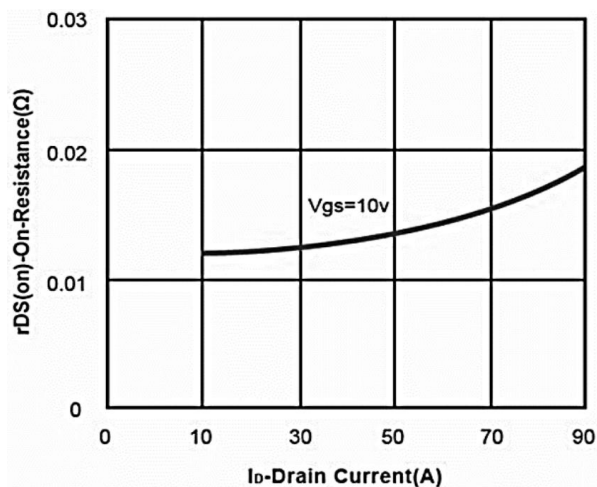


Figure.2 On-Resistance Vs. Drain Current

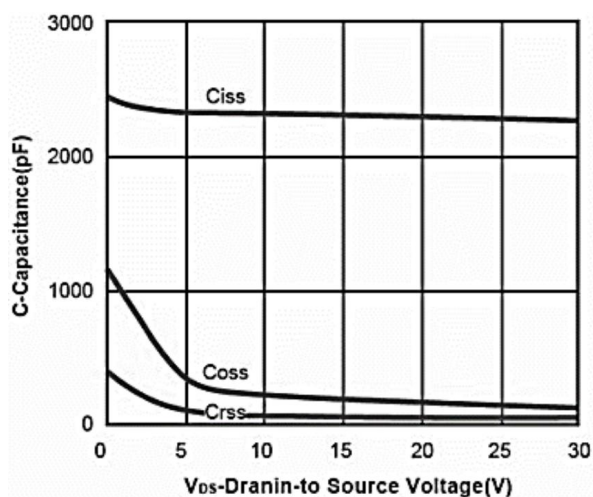


Figure.3 Capacitance

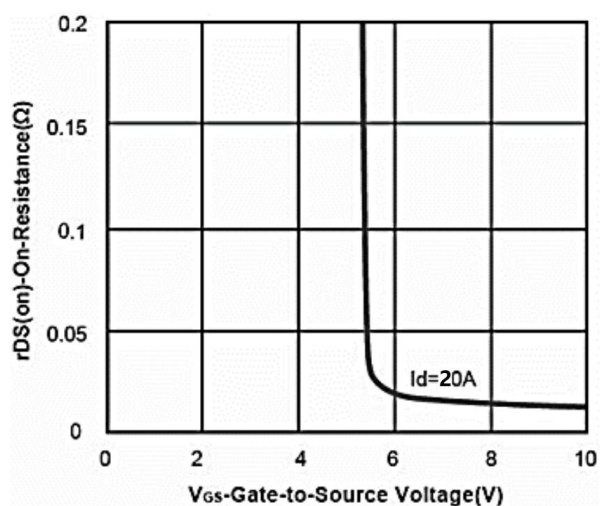


Figure.4 On-Resistance Vs. Gate-to-Source Voltage

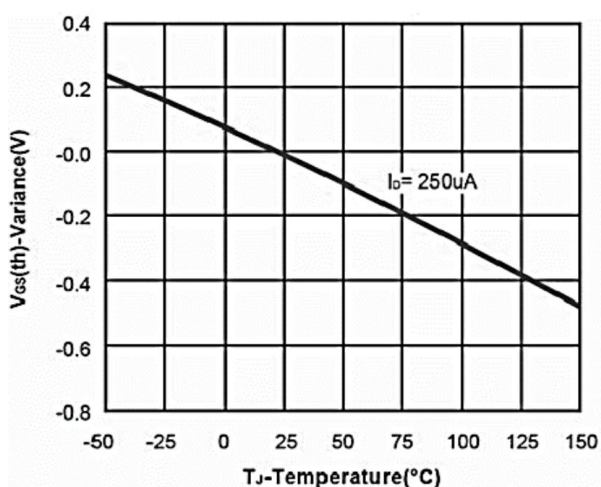


Figure.5 Threshold Voltage

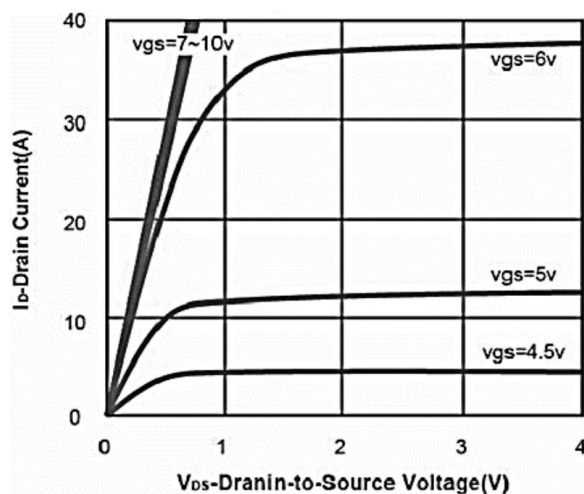


Figure.6 On-Region Characteristics

Typical Characteristics

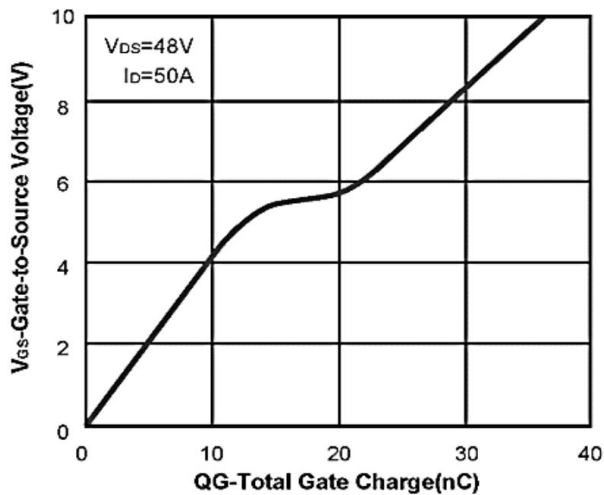


Figure.7 Gate Charge

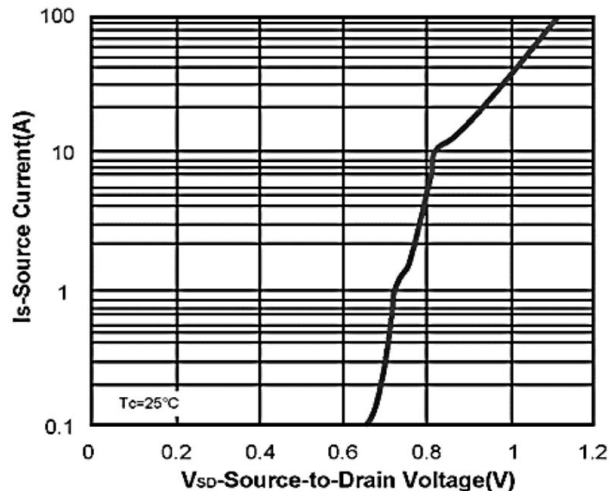


Figure.8 Body-diode Characteristic

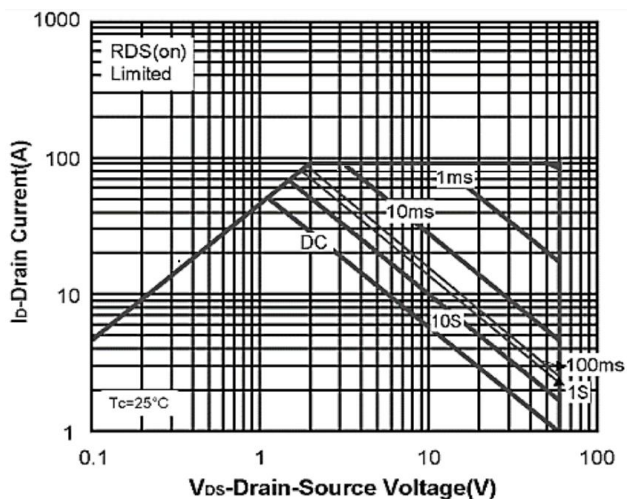


Figure.9 Safe Operating Area

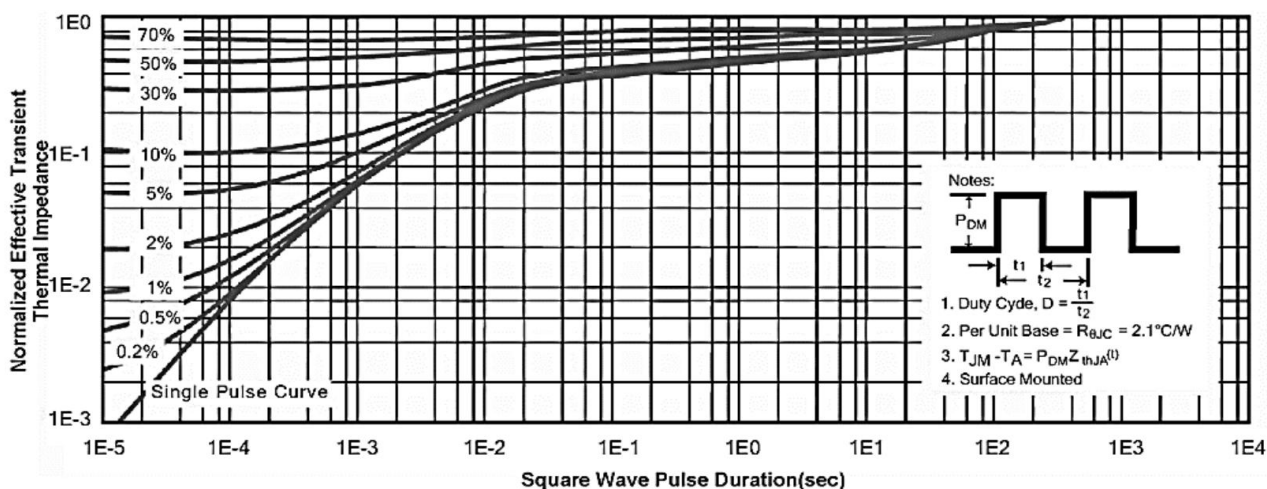
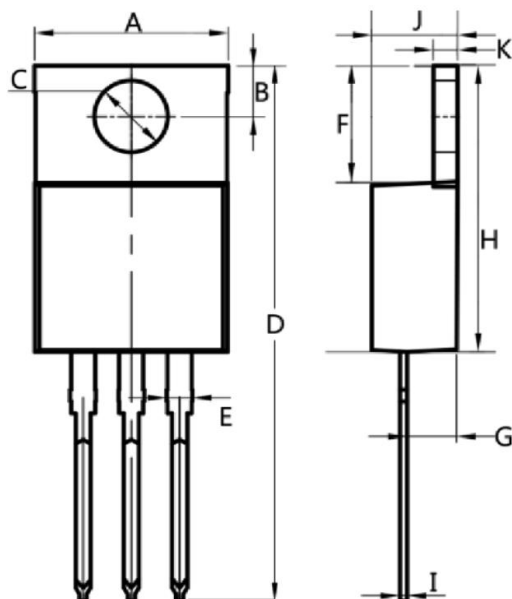


Figure.10 Normalized Maximum Transient Thermal Impedance

TO-220AB Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	10.000	10.400	0.394	0.409
B	2.500	3.000	0.098	0.118
C	3.500	4.000	0.138	0.157
D	28.000	30.000	1.102	1.181
E	1.100	1.500	0.043	0.059
F	6.200	6.600	0.244	0.260
G	2.900	3.300	0.114	0.130
H	15.000	16.000	0.591	0.630
I	0.350	0.450	0.014	0.018
J	4.300	4.700	0.169	0.185
K	1.200	1.400	0.047	0.055