

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
60V	3.1mΩ@10V	150A

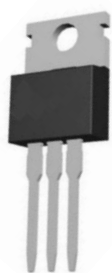
Feature

- High density cell design for ultra low Rdson
- Fully characterized avalanche voltage and current
- Good stability and uniformity with high E_{AS}
- Excellent package for good heat dissipation
- Special process technology for high ESD capability

Application

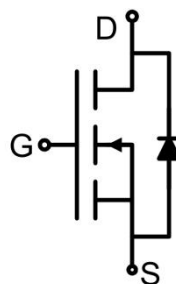
- Power switching application
- Hard switched and high frequency circuits
- Uninterruptible power supply

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	I _D	150	A
Continuous Drain Current(T _c =100°C)	I _D (100°C)	105	A
Pulsed Drain Current	I _{DM}	600	A
Power Dissipation	P _D	220	W
Thermal Resistance,Junction-to-Case ¹⁾	R _{θJC}	0.68	°C/W
Single pulse avalanche energy ⁴⁾	E _{AS}	1600	mJ
Junction Temperature	T _J	175	°C
Storage Temperature	T _{STG}	-55 ~ +175	°C

Electrical characteristics (T_c=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 ²⁾	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	2.0	3.0	4.0	V
Drain-source on-resistance ²⁾	R _{DS(on)}	V _{GS} =10V, I _D =75A		2.8	3.1	mΩ
Dynamic characteristics³⁾						
Input Capacitance	C _{iss}	V _{DS} =30V, V _{GS} =0V, f =1.0MHz		7872		pF
Output Capacitance	C _{oss}			634		
Reverse Transfer Capacitance	C _{rss}			502		
Total Gate Charge	Q _g	V _{DS} =30V, V _{GS} =10V, I _D =75A		152		nC
Gate-Source Charge	Q _{gs}			33		
Gate-Drain Charge	Q _{gd}			55		
Turn-on delay time	t _{d(on)}	V _{DD} =30V, V _{GS} =10V, R _L =0.4Ω, R _G =2.5Ω		25		nS
Turn-on rise time	t _r			23		
Turn-off delay time	t _{d(off)}			90		
Turn-off fall time	t _f			38		
Source-Drain Diode characteristics						
Diode Forward Current ¹⁾	I _S				150	A
Diode Forward voltage ²⁾	V _{SD}	V _{GS} =0V, I _S =75A			1.2	V
Reverse Recovery Time	T _{rr}	T _J = 25°C, I _F =75A di/dt = 100A/μs ²⁾		60		nS
Reverse Recovery Charge	Q _{rr}			80		nC

Notes:

1) Surface Mounted on FR4 Board, t ≤ 10 sec.

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

3) Guaranteed by design, not subject to production.

4) EAS condition: T_J=25°C, V_{DD}=30V, V_G=10V, L=0.5mH, R_G=25Ω.

Typical Characteristics

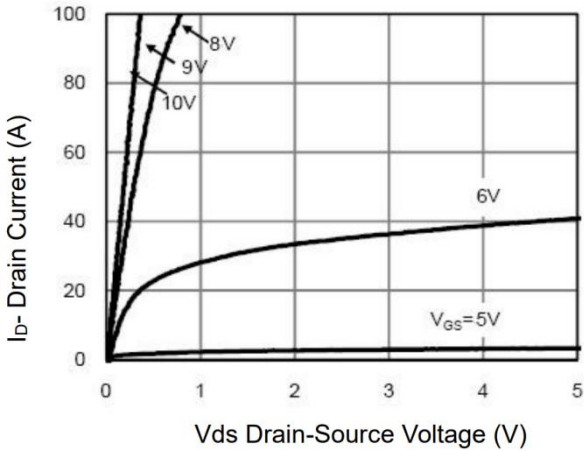


Figure 1 Output Characteristics

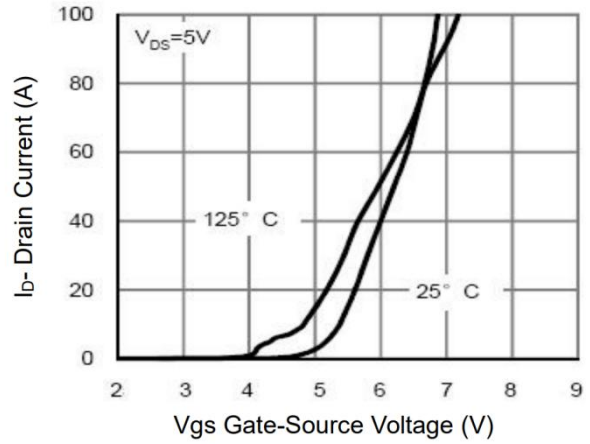


Figure 2 Transfer Characteristics

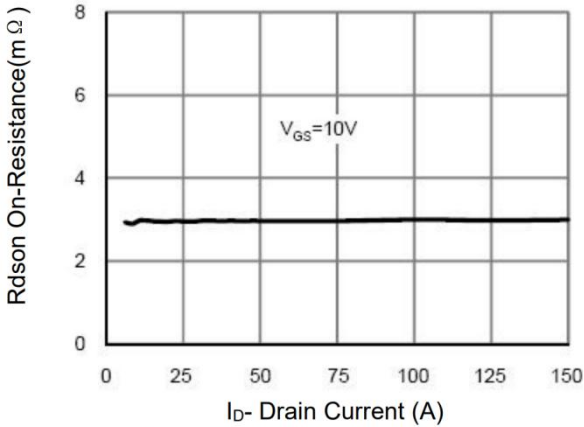


Figure 3 Rdson- Drain Current

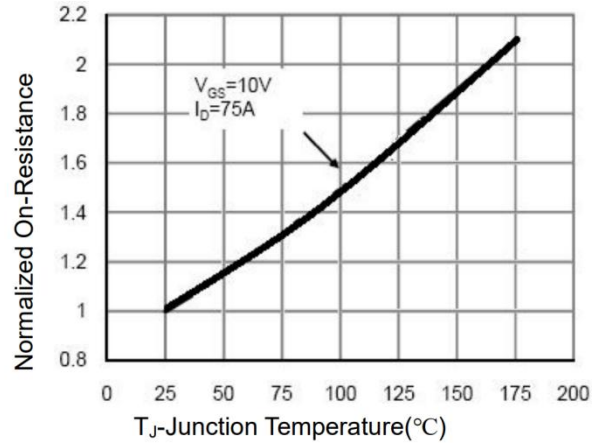


Figure 4 Rdson-Junction Temperature

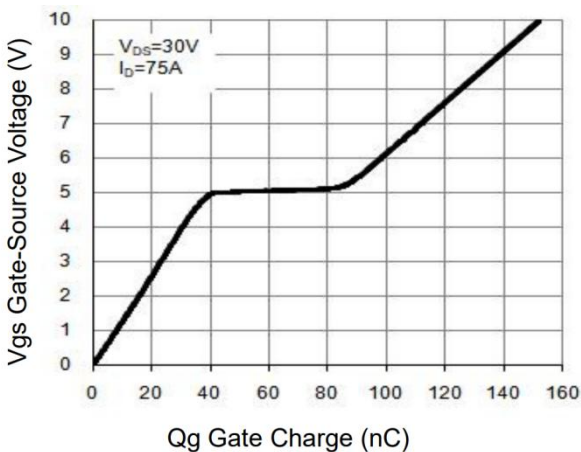


Figure 5 Gate Charge

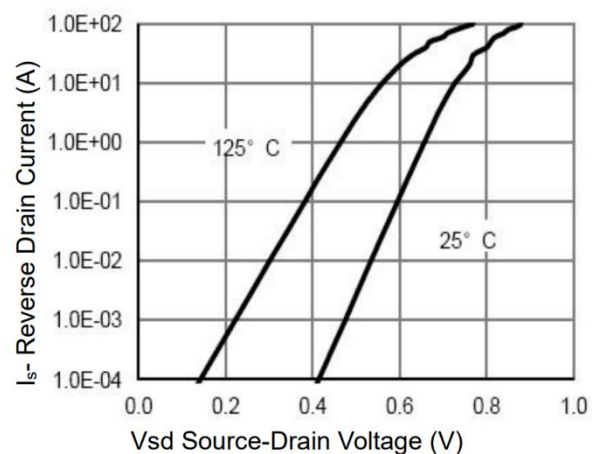


Figure 6 Source- Drain Diode Forward

Typical Characteristics

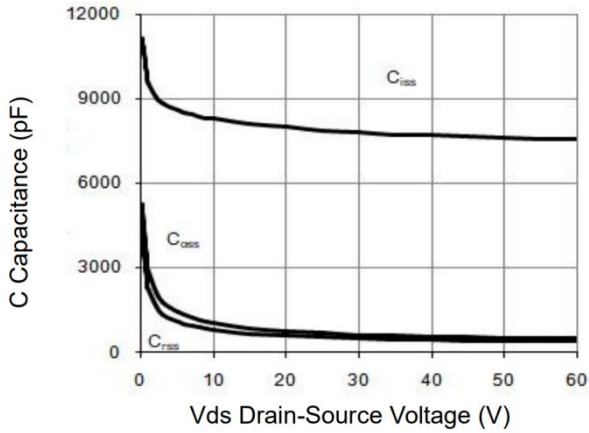


Figure 7 Capacitance vs Vds

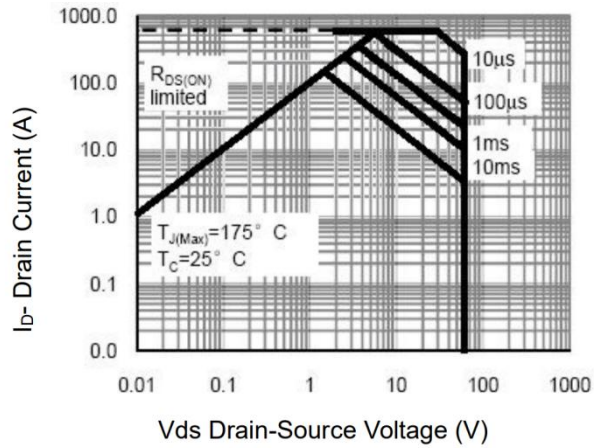


Figure 8 Safe Operation Area

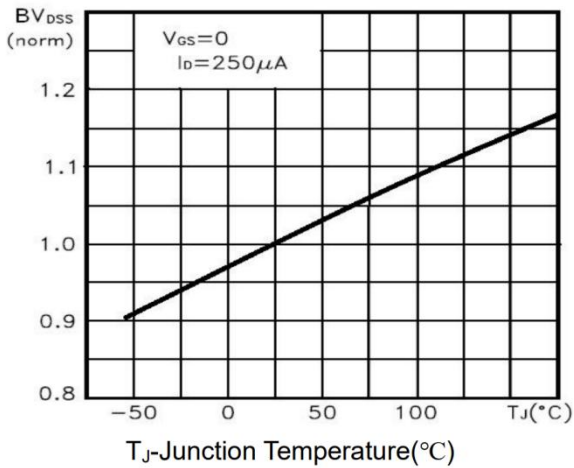


Figure 9 BV_{DSS} vs Junction Temperature

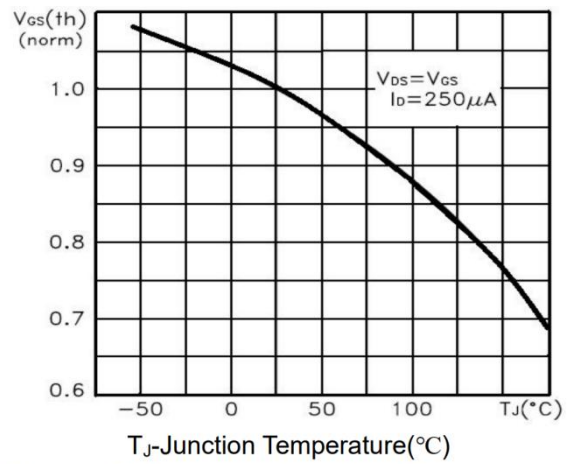


Figure 10 V_{GS(th)} vs Junction Temperature

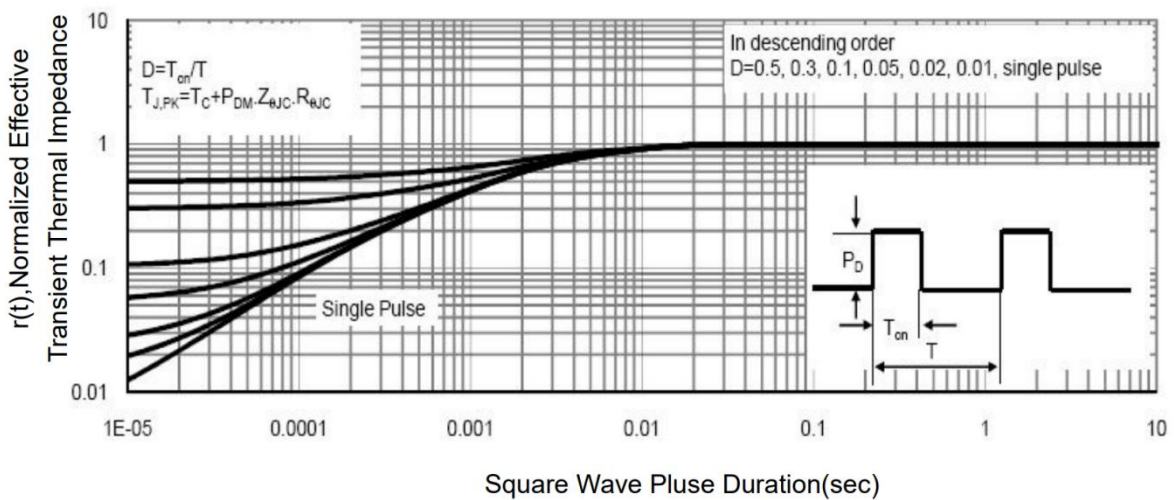
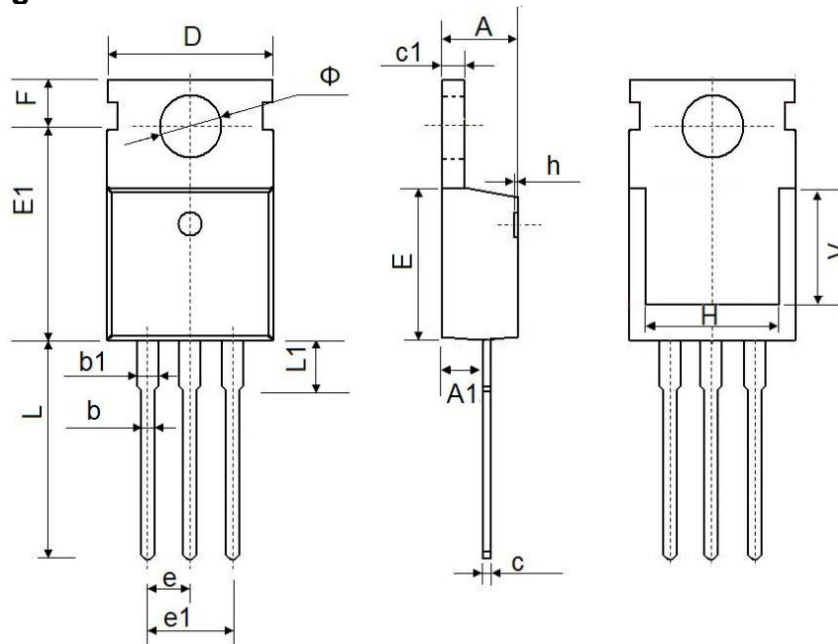


Figure 11 Normalized Maximum Transient Thermal Impedance

TO-220AB Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.400	4.600	0.173	0.181
A1	2.250	2.550	0.089	0.100
b	0.710	0.910	0.028	0.036
b1	1.170	1.370	0.046	0.054
c	0.330	0.650	0.013	0.026
c1	1.200	1.400	0.047	0.055
D	9.910	10.250	0.390	0.404
E	8.950	9.750	0.352	0.384
E1	12.650	12.950	0.498	0.510
e	2.540 TYP		0.100 TYP	
e1	4.980	5.180	0.196	0.204
F	2.650	2.950	0.104	0.116
H	7.900	8.100	0.311	0.319
h	0.000	0.300	0.000	0.012
L	12.900	13.400	0.508	0.528
L1	2.850	3.250	0.112	0.128
V	7.500 REF		0.295 REF	
Φ	3.400	3.800	0.134	0.150