AT45N10S-Q1

N-Channel Enhancement Mode Power MOSFET

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
100V	17mΩ@10V	45A

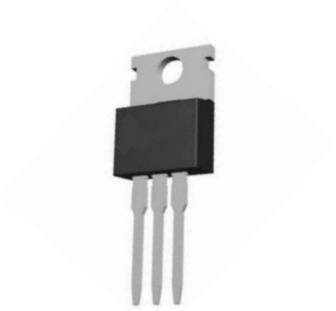
Feature

- 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
- Suffix "-Q1" for AEC-Q101

Application

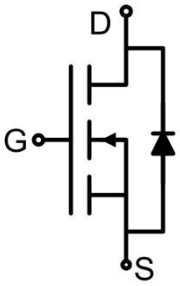
- Power switching application
- Hard switched and high frequency circuits
- Uninterruptible power supply

Package

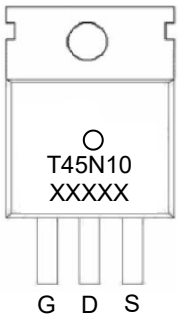


TO-220AB

Circuit diagram



Marking



AT45N10S-Q1

N-Channel Enhancement Mode Power MOSFET

Absolute maximum ratings (Ta=25℃ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	100	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current	I_D	45	A
Pulsed Drain Current	I_{DM}	220	A
Power Dissipation	P_D	100	W
Thermal Resistance,Junction-to-Case	$R_{\theta JC}$	1.25	℃/W
Single pulse avalanche energy	E_{AS}	81	mJ
Junction Temperature	T_J	150	℃
Storage Temperature	T_{STG}	-55 ~ +150	℃

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	100			V
Zero gate voltage drain current	I_{DSS}	V_{DS} =80V,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	2.8	4	V
Drain-source on-resistance[1)]	$R_{DS(on)}$	V_{GS} =10V, I_D =20A		14	17	mΩ
Dynamic characteristics[2)]						
Input Capacitance	C_{iss}	V_{DS} =50V,V_{GS} =0V,f =1MHz		1135		pF
Output Capacitance	C_{oss}			399		
Reverse Transfer Capacitance	C_{rss}			18		
Total Gate Charge	Q_g	V_{DS} =50V,V_{GS} =10V,ID =25A		16		nC
Gate-Source Charge	Q_{gs}			5.6		
Gate-Drain Charge	Q_{gd}			2.4		
Turn-on delay time	$t_{d(on)}$	V_{DD}=50V,V_{GS}=10V, I_D =25A, R_{GEN}=2.2Ω		39.2		nS
Turn-on rise time	t_r			11		
Turn-off delay time	$t_{d(off)}$			53.2		
Turn-off fall time	t_f			15.8		
Source-Drain Diode characteristics						
Diode Forward Current[1)]	I_S				45	A
Diode Forward voltage	V_{DS}	V_{GS} =0V, I_S=20A			1.3	V
Reverse Recovery Time	t_{rr}	T_J = 25°C, I_F =20A di/dt = 100A/μs [1)]		39.8		nS
Reverse Recovery Charge	Q_{rr}			42		nC

Notes:

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

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

Typical Characteristics

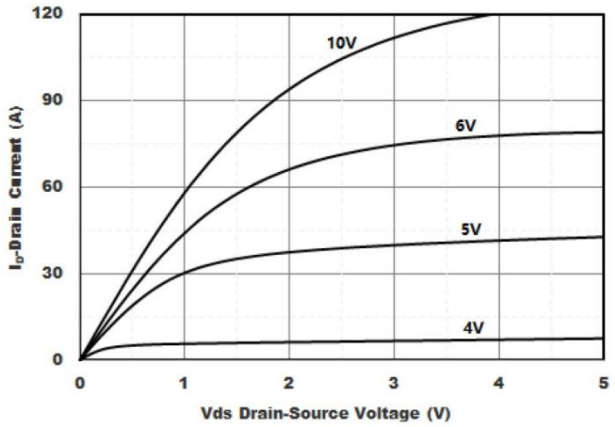


Figure1. Output Characteristics

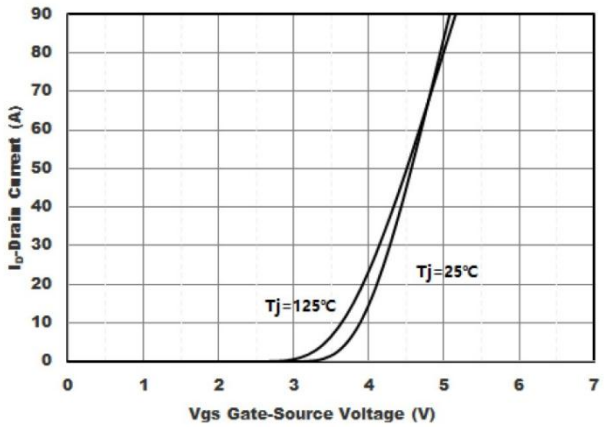


Figure2. Transfer Characteristics

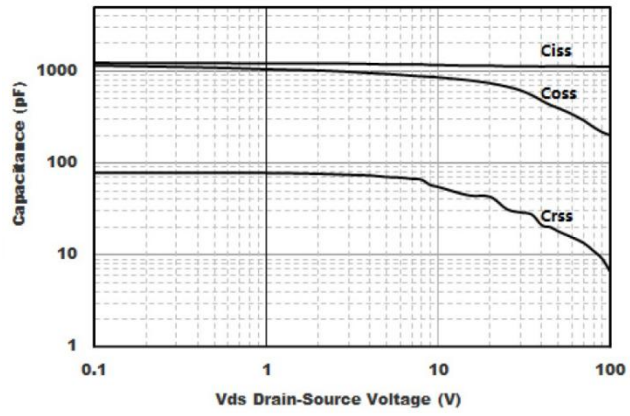


Figure3. Capacitance Characteristics

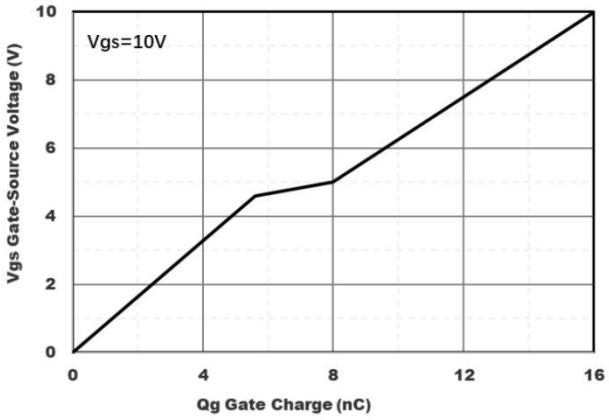


Figure4. Gate Charge

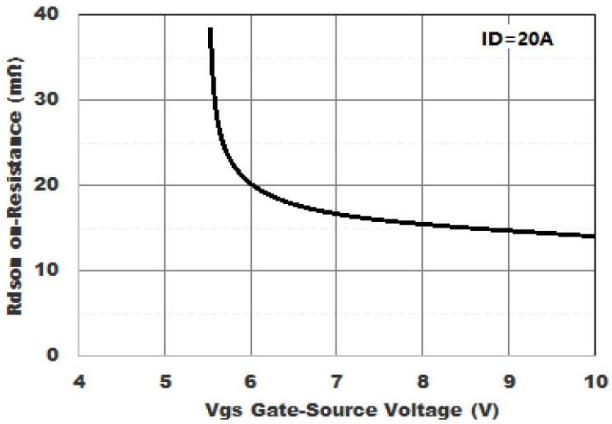


Figure5. : On-Resistance vs. Drain Current and Gate Voltage

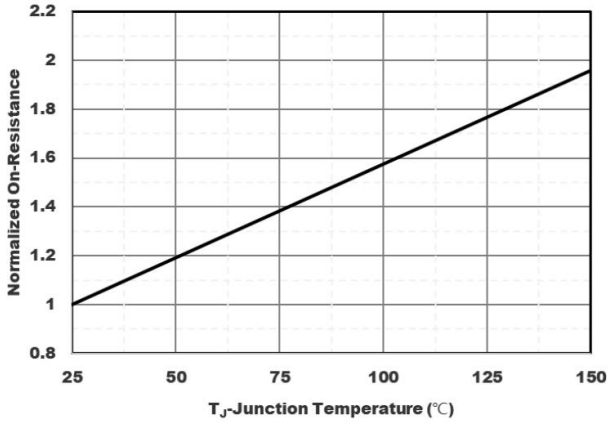


Figure6.Normalized On-Resistance

Typical Characteristics

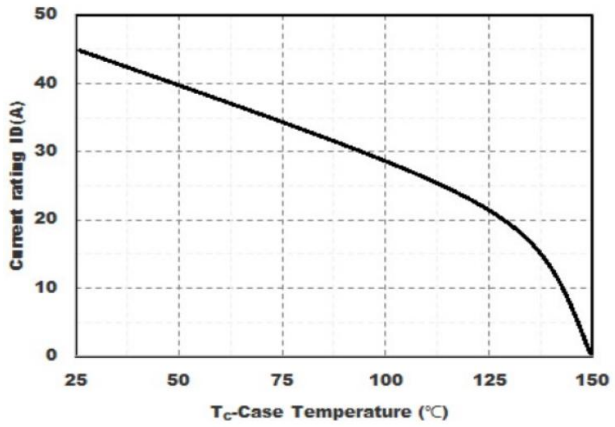


Figure7. Drain current

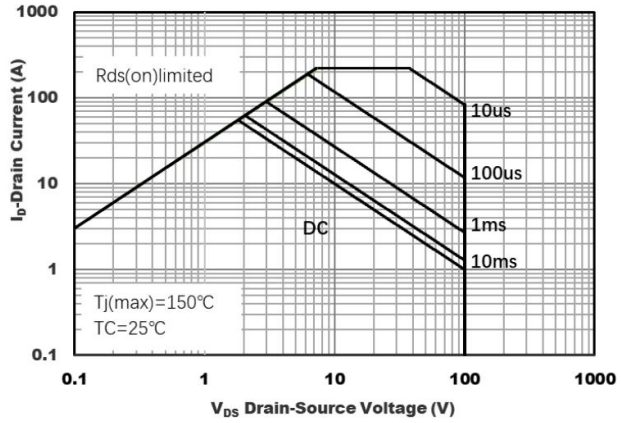


Figure8.Safe Operation Area

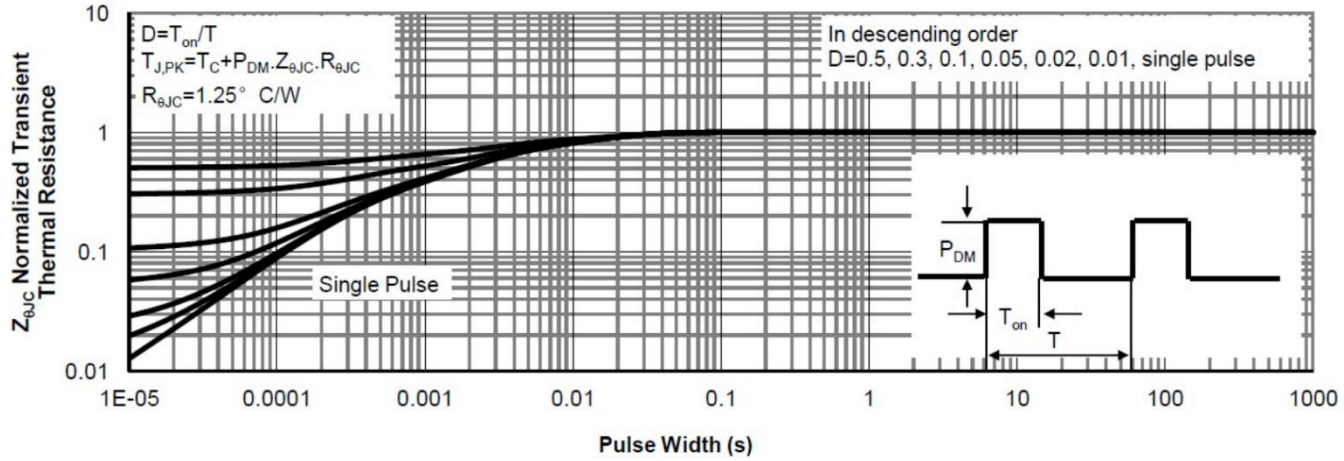
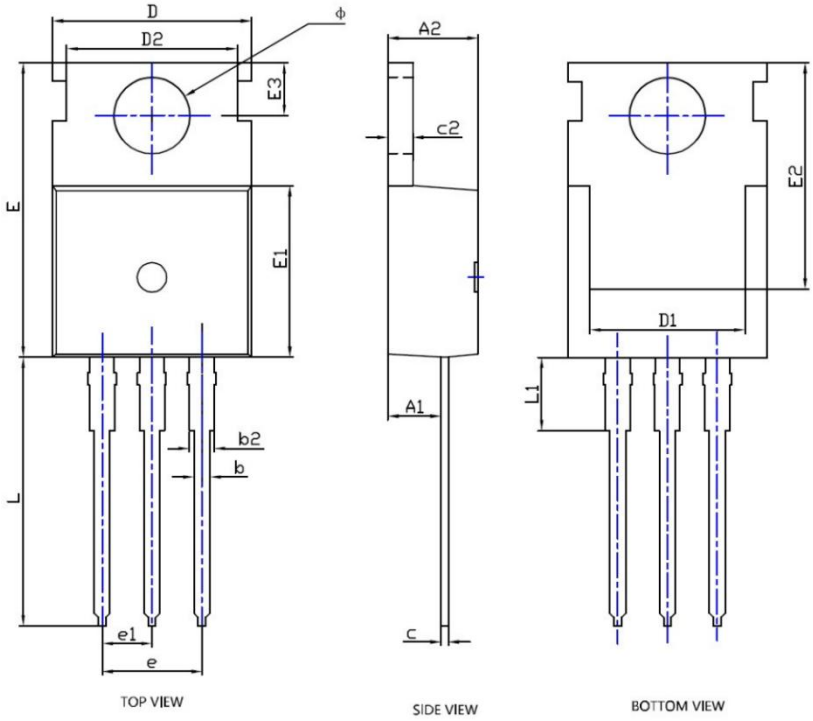


Figure9.Normalized Maximum Transient thermal impedance

TO-220AB Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A1	2.300	2.500	0.091	0.098
A2	4.400	4.600	0.173	0.181
b	0.700	0.900	0.028	0.035
b2	1.250	1.420	0.049	0.056
c	0.450	0.550	0.018	0.022
c2	1.270	1.330	0.050	0.052
D	9.700	10.200	0.382	0.402
D1	7.600	8.400	0.299	0.331
D2	8.500	8.900	0.335	0.350
E	15.300	16.100	0.602	0.634
E1	9.100	9.300	0.358	0.366
E2	12.630	13.030	0.497	0.513
E3	2.750BSC		0.108BSC	
e	5.080BSC		0.200BSC	
e1	2.540BSC		0.100BSC	
L	13.000	13.500	0.512	0.531
L1	0.000	3.500	0.000	0.138
Φ	3.550	3.750	0.140	0.148