

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
150V	5.8mΩ@10V	160A

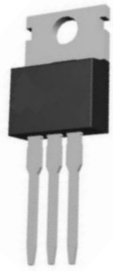
Feature

- Excellent gate charge x $R_{DS(on)}$ product(FOM)
- Very low on-resistance $R_{DS(on)}$
- Suffix "-Q1" for AEC-Q101

Application

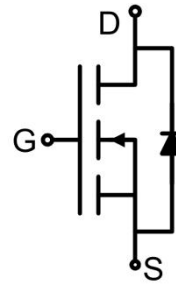
- DC/DC Converter
- Ideal for high-frequency switching and synchronous rectification

Package

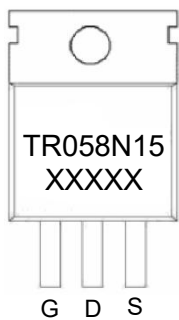


TO-220AB

Circuit diagram



Marking



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

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V _{DS}	150	V
Gate-Source Voltage	V _{GS}	±20	V
Continuous Drain Current	I _D	160	A
Continuous Drain Current(T _c =100°C)	I _D (100°C)	112	A
Pulsed Drain Current	I _{DM}	640	A
Power Dissipation	P _D	320	W
Thermal Resistance,Junction-to-Case	R _{θJC}	0.47	°C/W
Single pulse avalanche energy ¹⁾	E _{AS}	1075	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	150			V
Zero gate voltage drain current	I _{DSS}	V _{DS} = 150V, 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	2.5	3.5	4.5	V
Drain-source on-resistance	R _{DS(on)}	V _{GS} = 10V, I _D = 20A		4.9	5.8	mΩ
Dynamic characteristics²⁾						
Input Capacitance	C _{iss}	V _{DS} = 75V, V _{GS} = 0V, f = 1.0MHz		4762		pF
Output Capacitance	C _{oss}			1612		
Reverse Transfer	C _{rss}			50		
Total Gate Charge	Q _g	V _{DS} = 75V, V _{GS} = 10V, I _D = 20A		78.7		nC
Gate-Source Charge	Q _{gs}			23		
Gate-Drain Charge	Q _{gd}			22		
Turn-on delay time	t _{d(on)}	V _{DD} = 75V, V _{GS} = 10V, I _D = 80A, R _G = 3Ω		24		nS
Turn-on rise time	t _r			10		
Turn-off delay time	t _{d(off)}			70		
Turn-off fall time	t _f			18		
Source-Drain Diode characteristics						
Diode Forward Current	I _S				160	A
Diode Forward voltage	V _{SD}	V _{GS} = 0V, I _F = 45A			1.2	V
Reverse Recovery Time	t _{rr}	T _J = 25°C, I _F = 80A di/dt = 100A/μs		92		nS
Reverse Recovery Charge	Q _{rr}			270		nC

Notes:

1) EAS condition : T_J=25°C, V_{DD}=50V, V_G=10V, L=0.5mH, R_G=25Ω.

2) Guaranteed by design, not subject to production.

3) These curves are based on the junction-to-case thermal impedance which is measured with the device mounted to a large heatsink, assuming a maximum junction temperature of T_J(MAX)=175°C. The SOA curve provides a single pulse rating.

Typical Characteristics

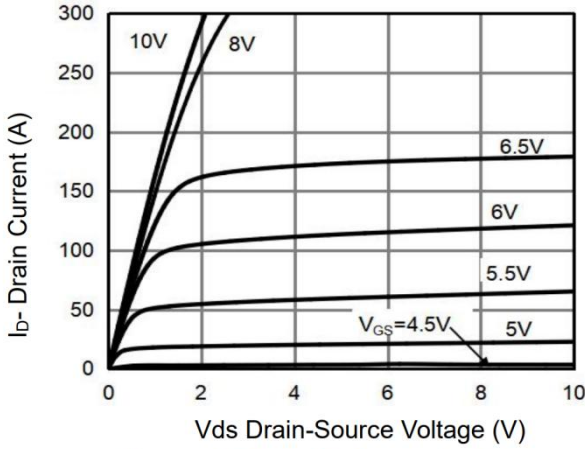


Figure 1 Output Characteristics

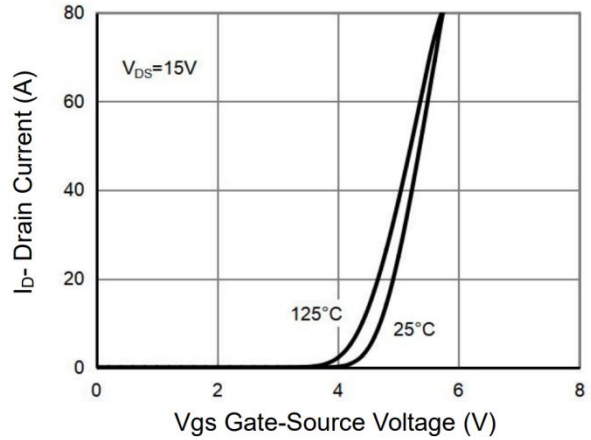


Figure 2 Transfer Characteristics

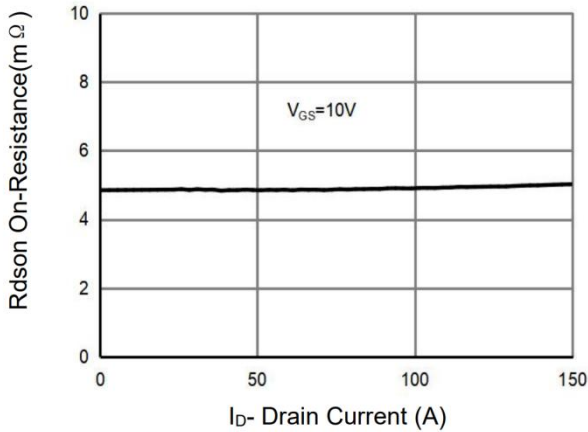


Figure 3 Rds(on)- Drain Current

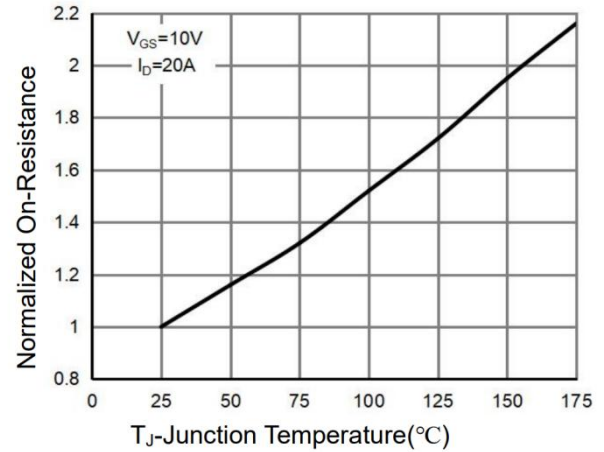


Figure 4 Rds(on)-Junction Temperature

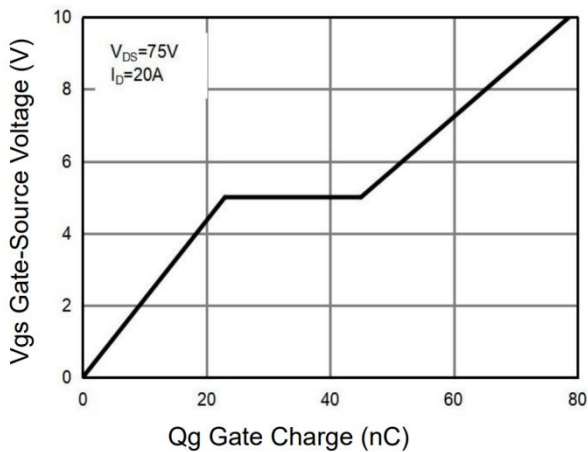


Figure 5 Gate Charge

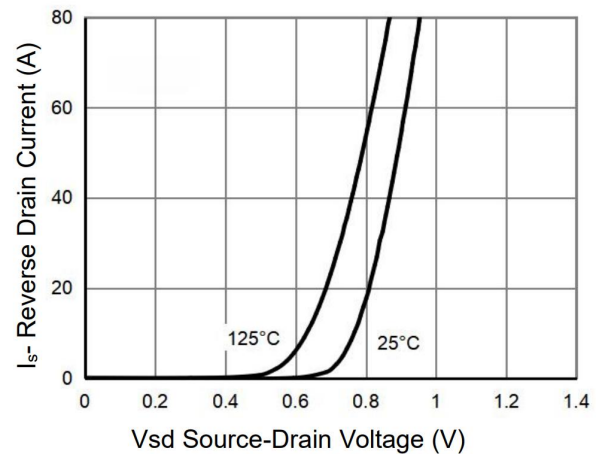


Figure 6 Source- Drain Diode Forward

Typical Characteristics

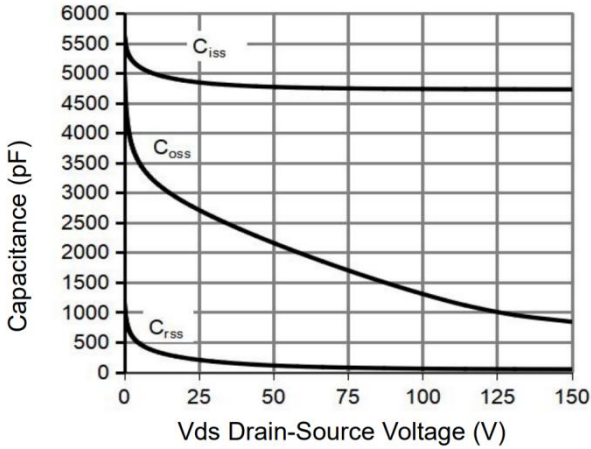


Figure 7 Capacitance vs Vds

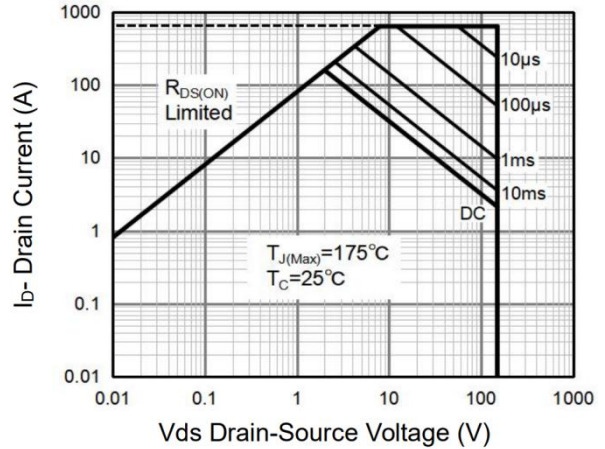


Figure 8 Safe Operation Area (Note3)

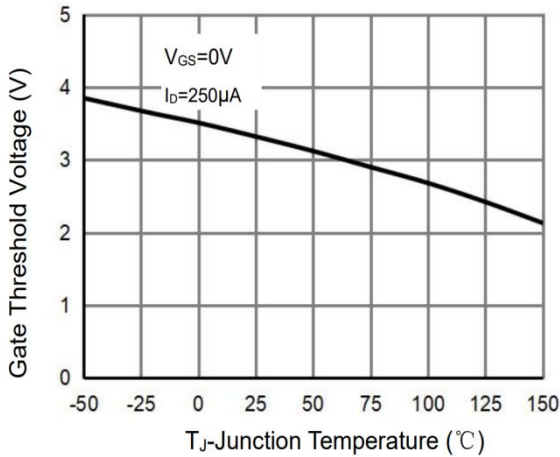


Figure 9 V_{GS(th)}-Junction Temperature

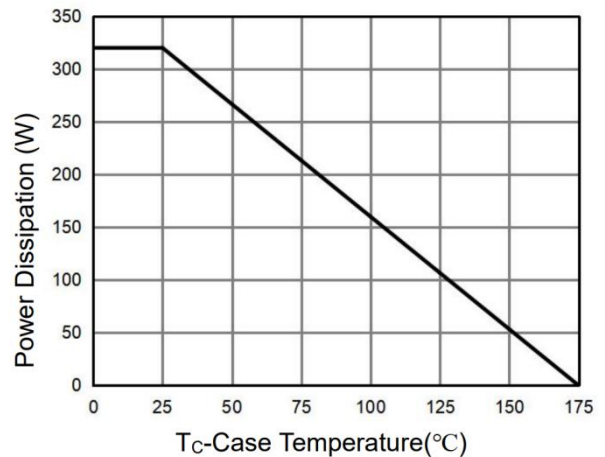


Figure 10 Power De-rating

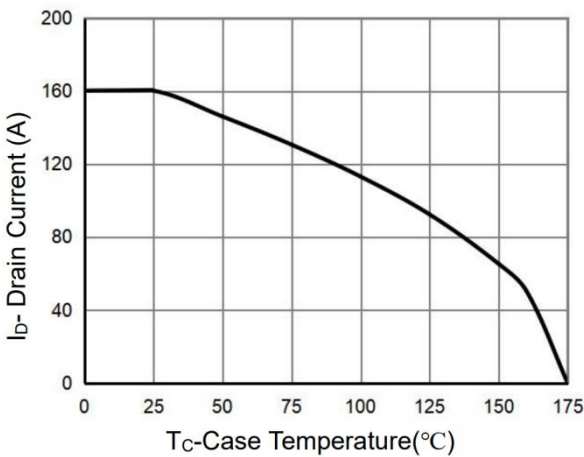


Figure 11 Current De-rating

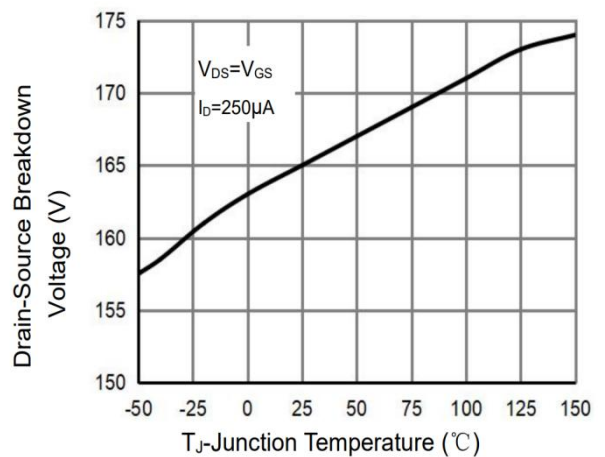
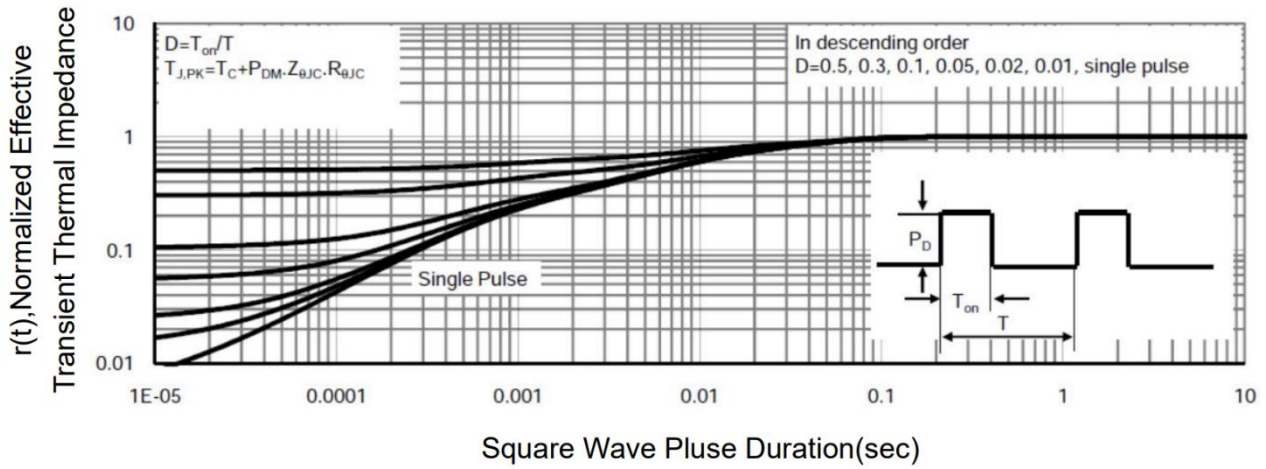
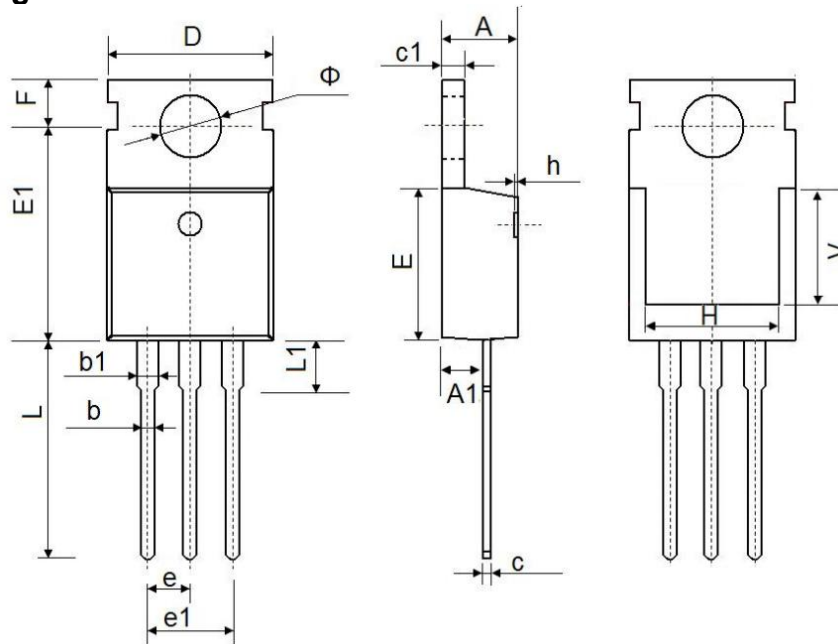


Figure 12 BV_{DSS}-Junction Temperature

Typical Characteristics



TO-220AB Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.400	4.670	0.173	0.184
A1	2.250	2.900	0.089	0.114
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	9.700	10.370	0.382	0.408
E	8.900	9.750	0.350	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	7.000	8.890	0.276	0.350
h	0.000	0.300	0.000	0.012
L	12.900	14.800	0.508	0.583
L1	2.540	3.840	0.100	0.151
V	6.900 REF.		0.276 REF.	
Φ	3.400	3.900	0.134	0.154