

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_b
85V	3.8mΩ@10V	160A

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

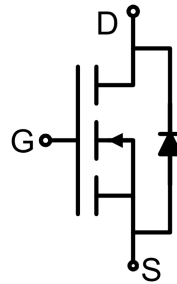
- DC/DC Converter
- Ideal for high-frequency switching and synchronous rectification

Package

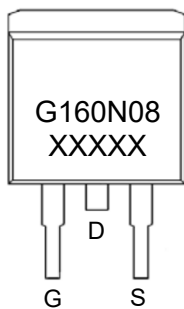


TO-263AB

Circuit diagram



Marking



Absolute maximum ratings ($T_A=25^\circ\text{C}$, unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	85	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current	I_D	160	A
Pulsed Drain Current	I_{DM}	480	A
Power Dissipation	P_D	220	W
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	0.6	$^\circ\text{C/W}$
Single pulse avalanche energy	E_{AS}	1440	mJ
Junction Temperature	T_J	150	$^\circ\text{C}$
Storage Temperature	T_{STG}	-55 ~ +150	$^\circ\text{C}$

Electrical characteristics ($T_A=25^\circ\text{C}$, unless otherwise noted)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 250\mu\text{A}$	85			V
Zero gate voltage drain current	I_{DSS}	$V_{DS} = 85V, V_{GS} = 0V$			1	μA
Gate-body leakage current	I_{GSS}	$V_{GS} = \pm 20V, V_{DS} = 0V$			± 100	nA
Gate threshold voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu\text{A}$	2.5		4.5	V
Drain-source on-resistance ¹⁾	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 80A$		3.1	3.8	m Ω
Forward transconductance ¹⁾	g_{FS}	$V_{DS} = 10V, I_D = 80A$	75			S
Dynamic characteristics²⁾						
Input Capacitance	C_{iss}	$V_{DS} = 40V, V_{GS} = 0V, f = 1\text{MHz}$		8500		pF
Output Capacitance	C_{oss}			1520		
Reverse Transfer Capacitance	C_{rss}			81		
Total Gate Charge	Q_g	$V_{DS} = 40V, V_{GS} = 10V, I_D = 80A$		105		nC
Gate-Source Charge	Q_{gs}			39		
Gate-Drain Charge	Q_{gd}			28		
Turn-on delay time	$t_{d(on)}$	$V_{DD} = 40V, V_{GS} = 10V, I_D = 80A, R_{GEN} = 4.7\Omega$		30.5		nS
Turn-on rise time	t_r			29		
Turn-off delay time	$t_{d(off)}$			95		
Turn-off fall time	t_f			34.5		
Source-Drain Diode characteristics						
Diode Forward Current ¹⁾	I_S				160	A
Diode Forward voltage	V_{DS}	$V_{GS} = 0V, I_S = 160A$			1.2	V
Reverse Recovery Time	t_{rr}	$T_J = 25^\circ\text{C}, I_F = I_S, di/dt = 100A/\mu\text{s}$ ¹⁾		95		nS
Reverse Recovery Charge	Q_{rr}			225		nC

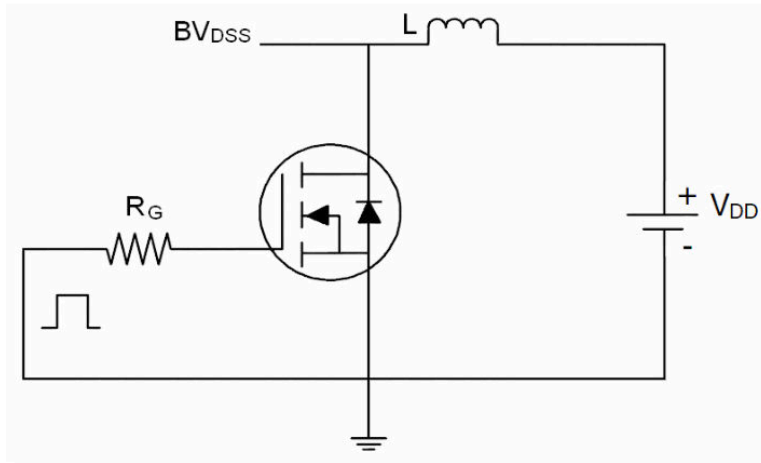
Notes:

1) Pulse Test: Pulse Width < 300 μs , Duty Cycle $\leq 2\%$.

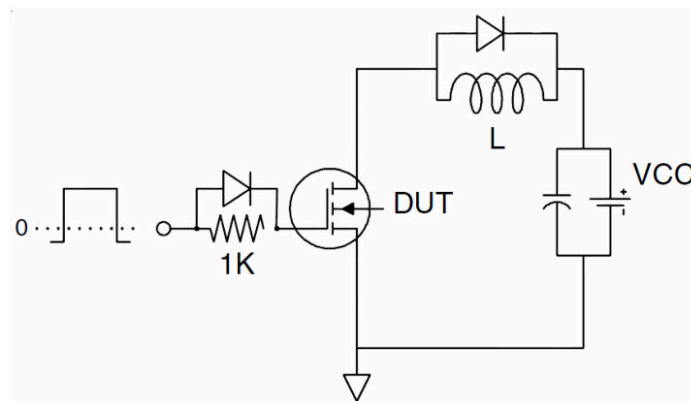
2) Guaranteed by design, not subject to production testing.

Test Circuit

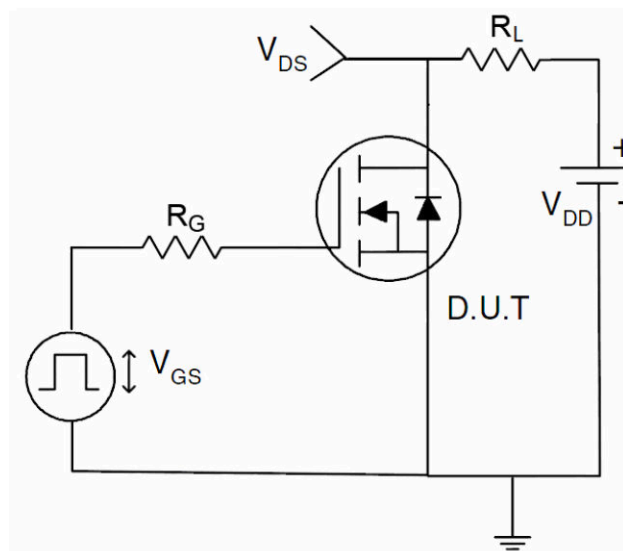
1) E_{AS} test Circuit



2) Gate charge test Circuit



3) Switch Time Test Circuit



Typical Characteristics

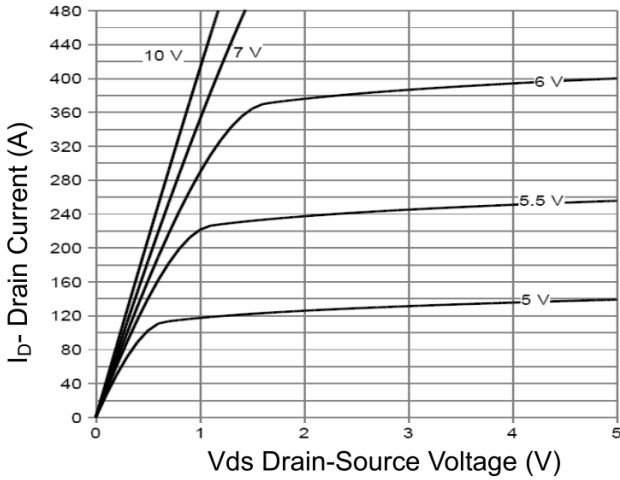


Figure 1 Output Characteristics

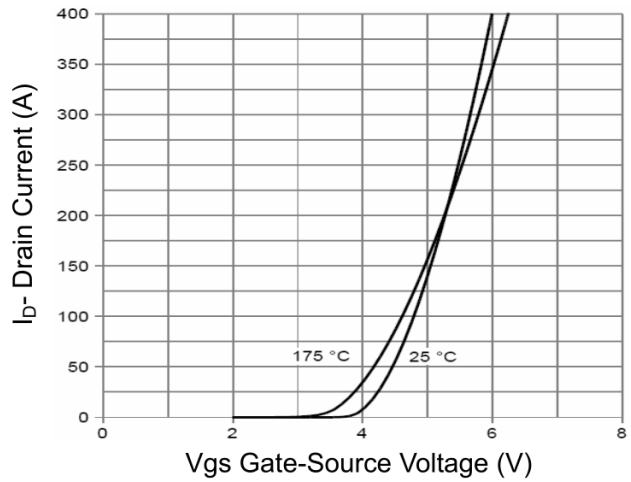


Figure 2 Transfer Characteristics

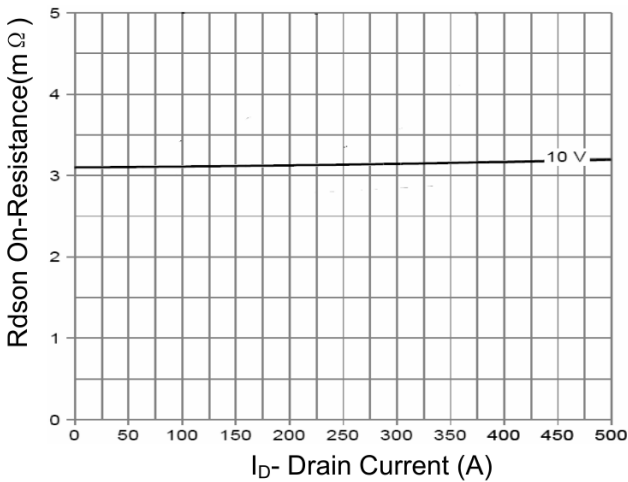


Figure 3 Rdson- Drain Current

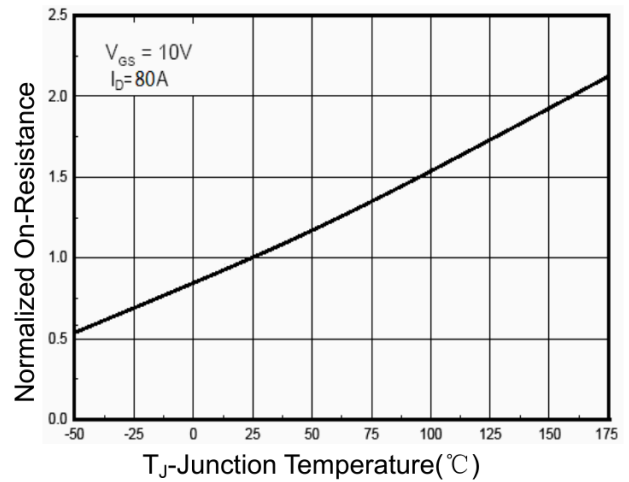


Figure 4 Rdson-Junction Temperature

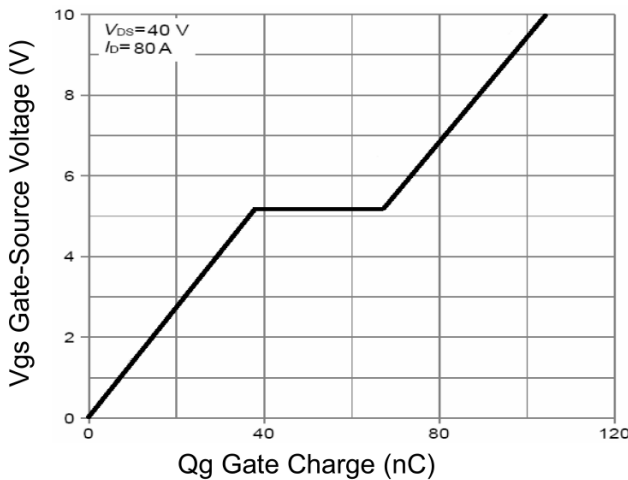


Figure 5 Gate Charge

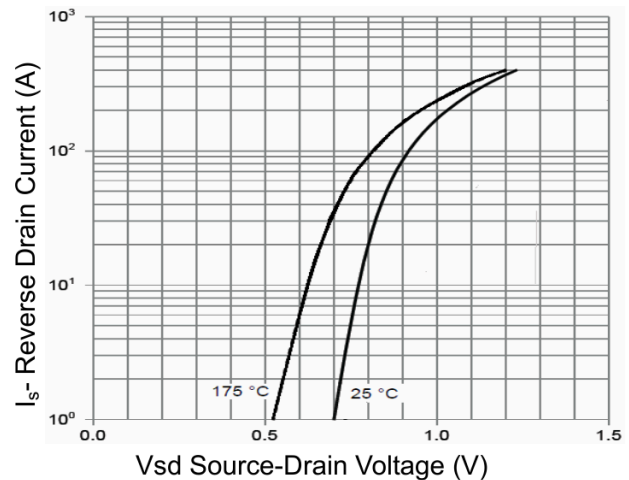


Figure 6 Source- Drain Diode Forward

Typical Characteristics

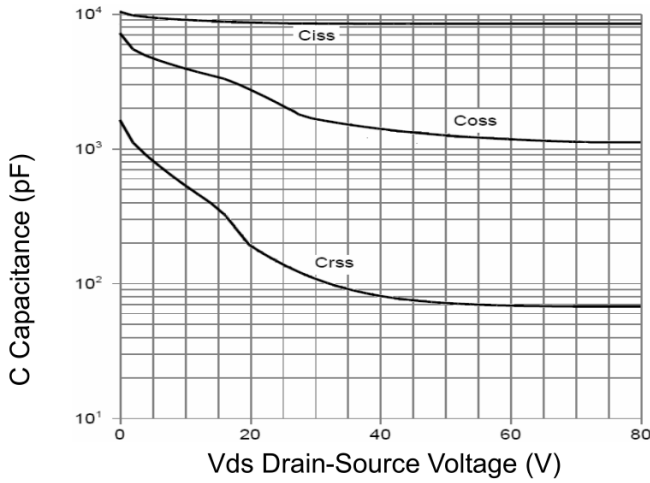


Figure 7 Capacitance vs Vds

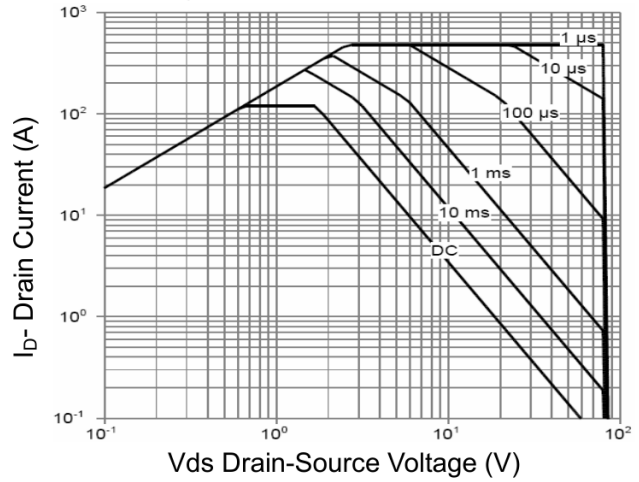


Figure 8 Safe Operation Area

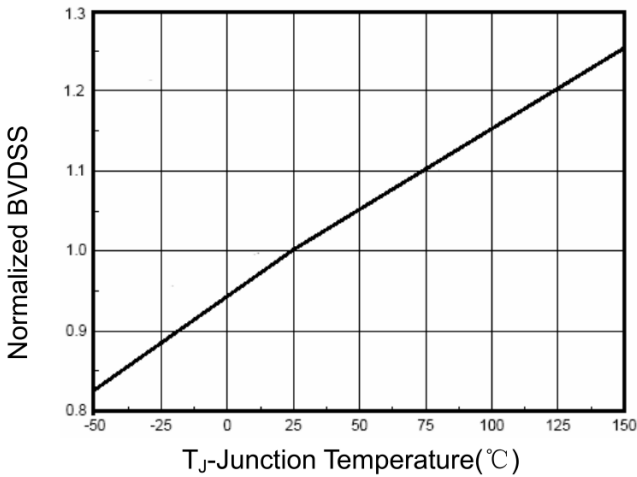


Figure 9 BV_{DSS} vs Junction Temperature

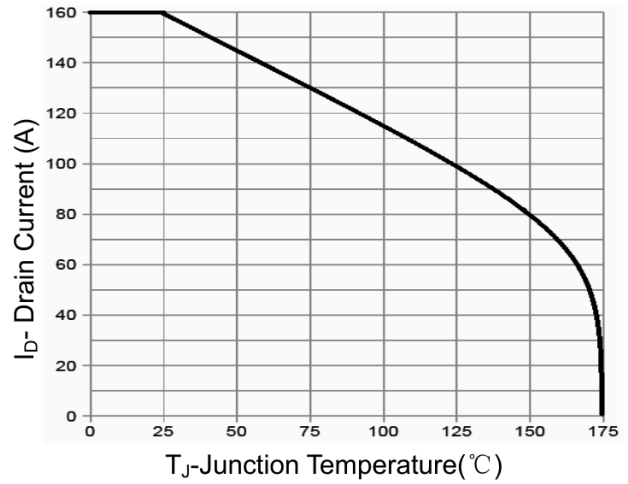


Figure 10 Current De-rating

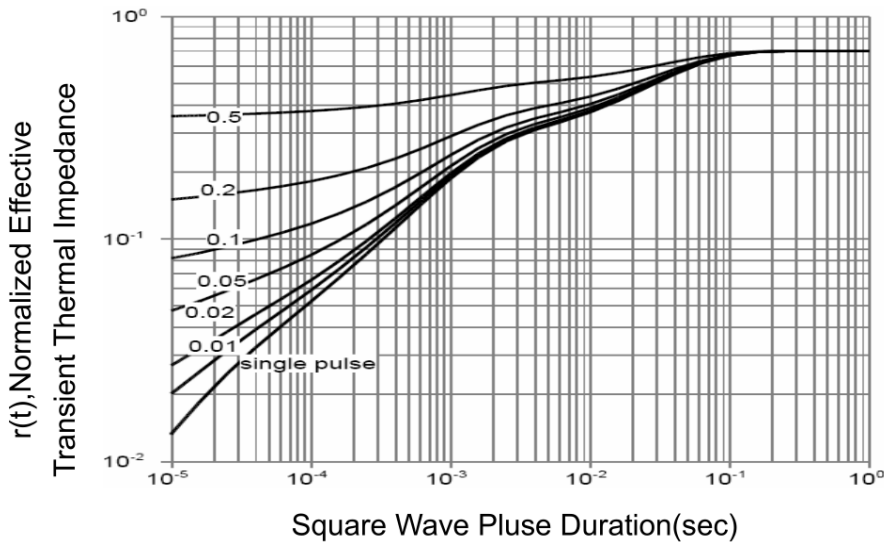
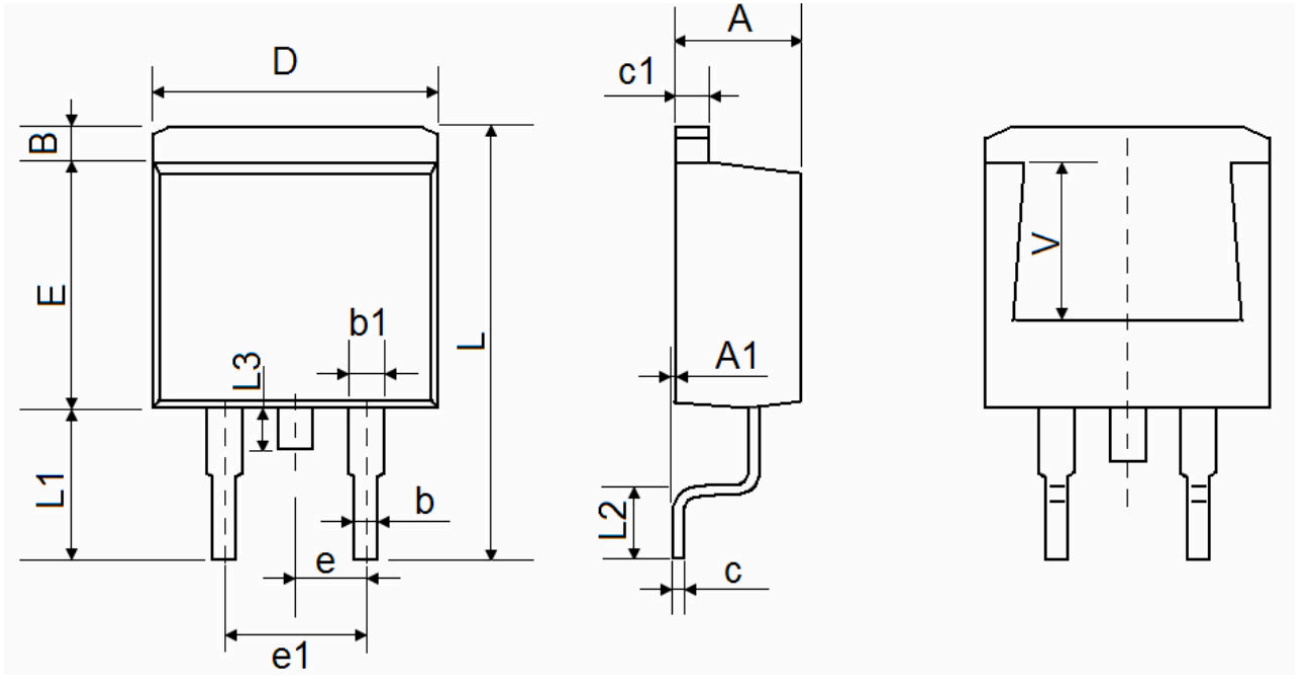


Figure 11 Normalized Maximum Transient Thermal Impedance

TO-263AB Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.470	4.670	0.176	0.184
A1	0.000	0.150	0.000	0.006
B	1.170	1.370	0.046	0.054
b	0.710	0.910	0.028	0.036
b1	1.170	1.370	0.046	0.054
c	0.310	0.530	0.012	0.021
c1	1.170	1.370	0.046	0.054
D	10.010	10.310	0.394	0.406
E	8.500	8.900	0.335	0.350
e	2.540 TYP.		0.100 TYP.	
e1	4.980	5.180	0.196	0.204
L	15.050	15.450	0.593	0.608
L1	5.080	5.480	0.200	0.216
L2	2.340	2.740	0.092	0.108
L3	1.300	1.700	0.051	0.067
V	5.600 REF.		0.220 REF.	