

### Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	$I_D$
82V	5.2mΩ@10V	140A

### Feature

- Special process technology for high ESD capability
- 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

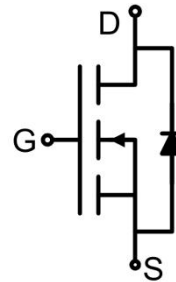
- Power switching application
- Hard switched and high frequency circuits
- Uninterruptible power supply

### Package

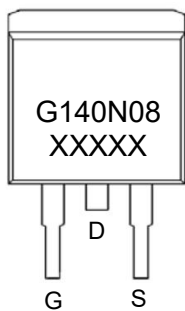


TO-263AB

### Circuit diagram



### Marking



### Absolute Maximum Ratings (T<sub>c</sub>=25°C unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V <sub>DS</sub>	82	V
Gate-Source Voltage	V <sub>GS</sub>	±20	V
Continuous Drain Current	I <sub>D</sub>	140	A
Continuous Drain Current(T <sub>C</sub> =100°C)	I <sub>D</sub> (100°C)	99	A
Pulsed Drain Current	I <sub>DM</sub>	480	A
Power Dissipation	P <sub>D</sub>	220	W
Thermal Resistance,Junction-to-Case <sup>1)</sup>	R <sub>θJC</sub>	0.68	°C/W
Single pulse avalanche energy	E <sub>AS</sub>	1500	mJ
Junction Temperature	T <sub>J</sub>	150	°C
Storage Temperature	T <sub>STG</sub>	-55 ~ +150	°C

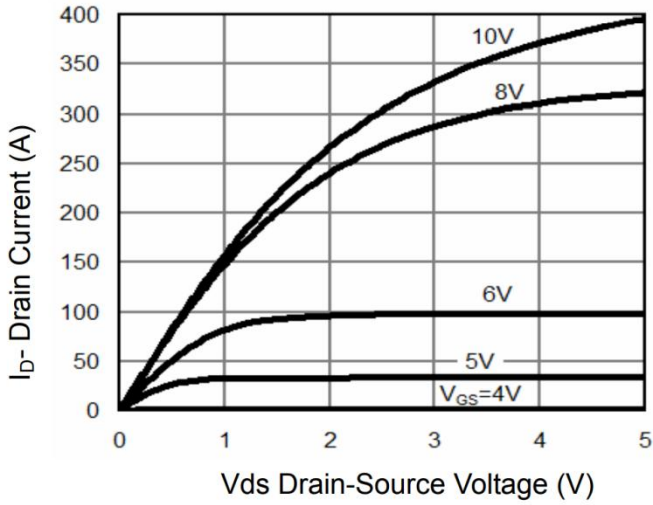
### Electrical characteristics (T<sub>c</sub>=25 °C unless otherwise noted)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
<b>Static Characteristics</b>						
Drain-source breakdown voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> = 0V, I <sub>D</sub> =250μA	82			V
Zero gate voltage drain current	I <sub>DSS</sub>	V <sub>DS</sub> =82V, V <sub>GS</sub> = 0V			1	μA
Gate-body leakage current	I <sub>GSS</sub>	V <sub>GS</sub> =±20V, V <sub>DS</sub> = 0V			±100	nA
Gate threshold voltage <sup>2)</sup>	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	2.5	3	3.8	V
Drain-source on-resistance <sup>2)</sup>	R <sub>DS(on)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =20A		4.3	5.2	mΩ
<b>Dynamic characteristics<sup>3)</sup></b>						
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =40V, V <sub>GS</sub> =0V, f =1MHz		7900		pF
Output Capacitance	C <sub>oss</sub>			445		
Reverse Transfer Capacitance	C <sub>rss</sub>			384		
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> =40V, V <sub>GS</sub> =10V, I <sub>D</sub> =20A		158		nC
Gate-Source Charge	Q <sub>gs</sub>			32		
Gate-Drain Charge	Q <sub>gd</sub>			51		
Turn-on delay time	t <sub>d(on)</sub>	V <sub>DD</sub> =30V, V <sub>GS</sub> =10V, R <sub>L</sub> =1Ω, R <sub>GEN</sub> =2.5Ω		23		nS
Turn-on rise time	t <sub>r</sub>			42		
Turn-off delay time	t <sub>d(off)</sub>			75		
Turn-off fall time	t <sub>f</sub>			26		
<b>Source-Drain Diode characteristics</b>						
Diode Forward Current <sup>1)</sup>	I <sub>S</sub>				140	A
Diode Forward voltage <sup>2)</sup>	V <sub>SD</sub>	V <sub>GS</sub> =0V, I <sub>S</sub> =140A			1.2	V
Reverse Recovery Time	t <sub>rr</sub>	T <sub>J</sub> = 25°C, I <sub>F</sub> =20A di/dt = 100A/μs <sup>2)</sup>		50		nS
Reverse Recovery Charge	Q <sub>rr</sub>			110		nC

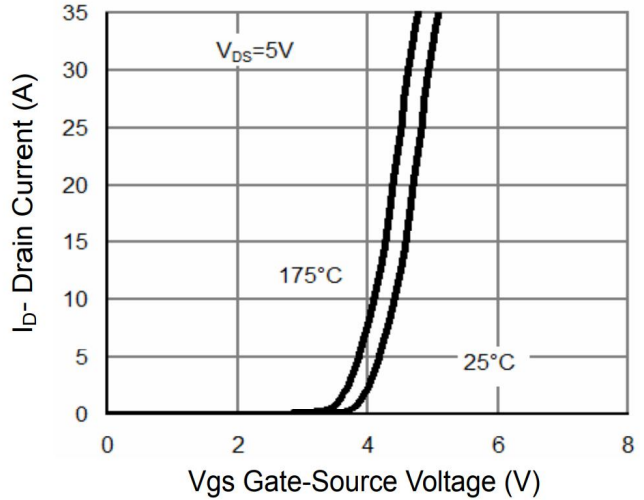
Notes:

- 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.

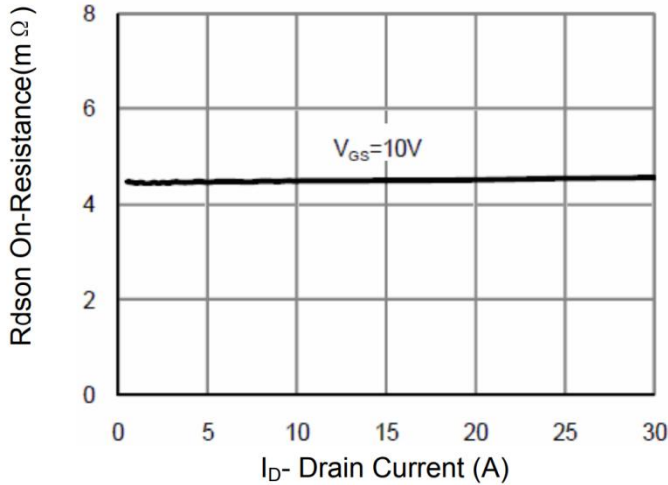
## Typical Characteristics



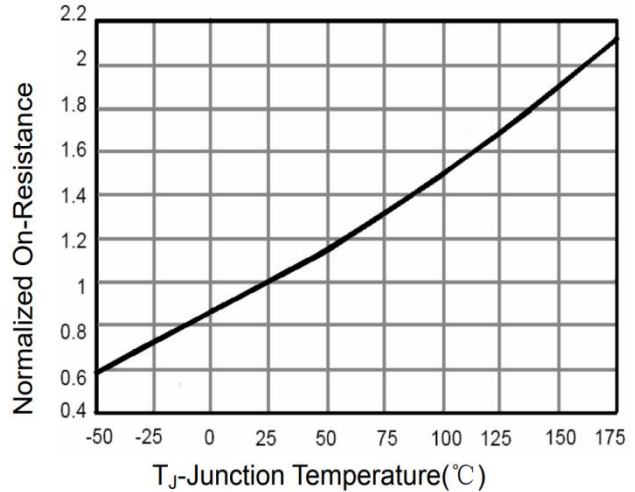
**Figure 1 Output Characteristics**



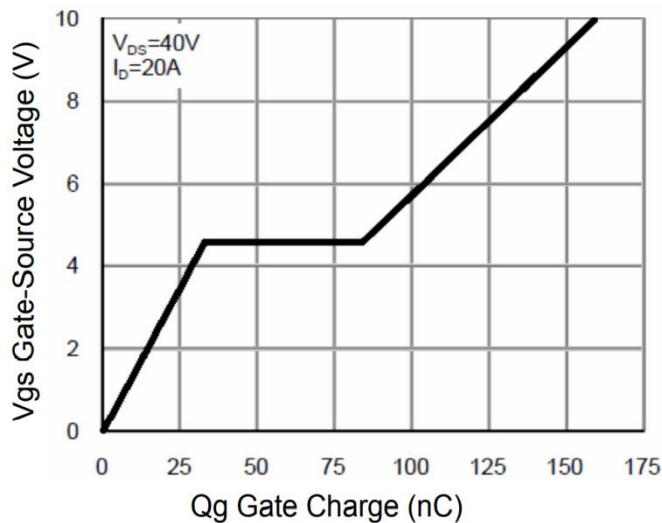
**Figure 2 Transfer Characteristics**



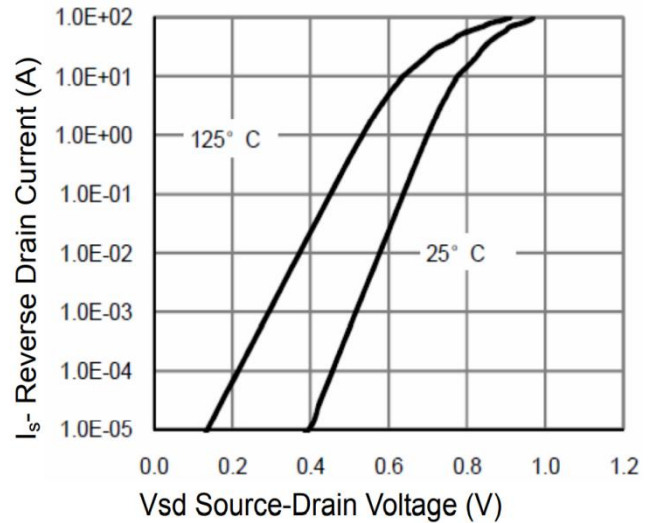
**Figure 3 Rdson- Drain Current**



**Figure 4 Rdson-Junction Temperature**

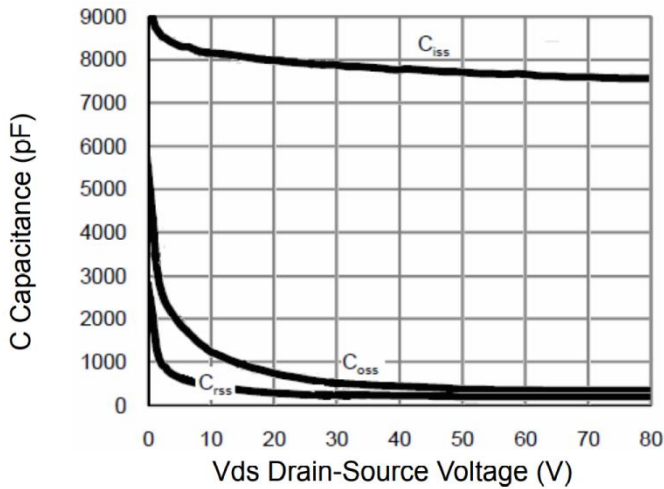


**Figure 5 Gate Charge**

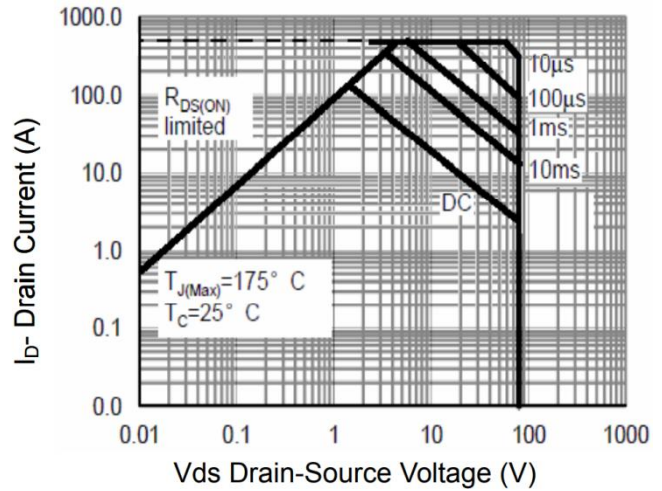


**Figure 6 Source- Drain Diode Forward**

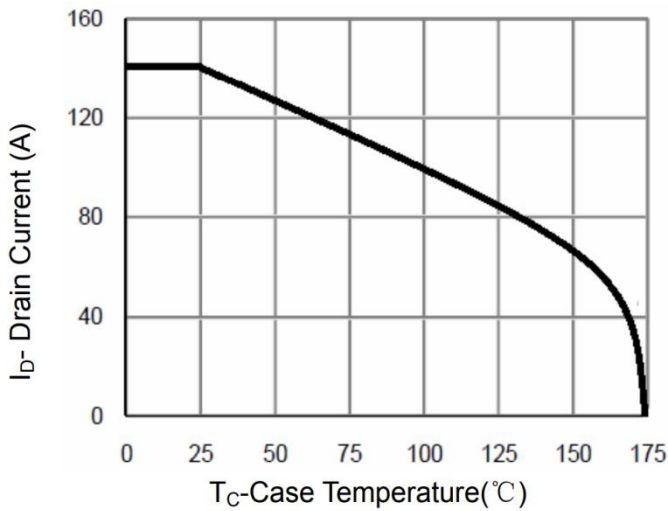
## Typical Characteristics



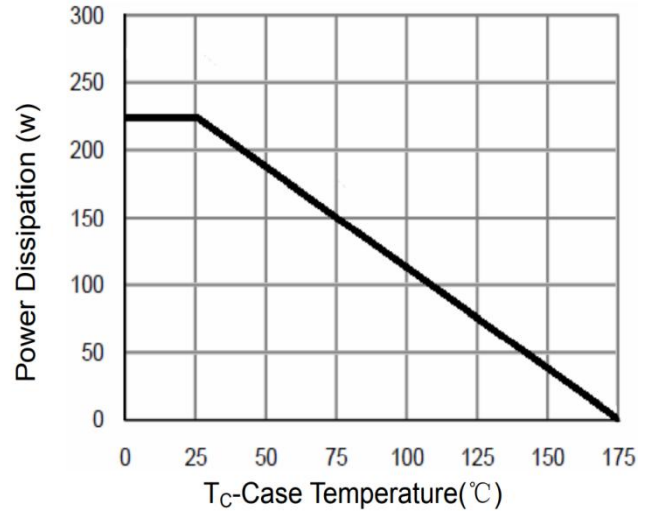
**Figure 7 Capacitance vs Vds**



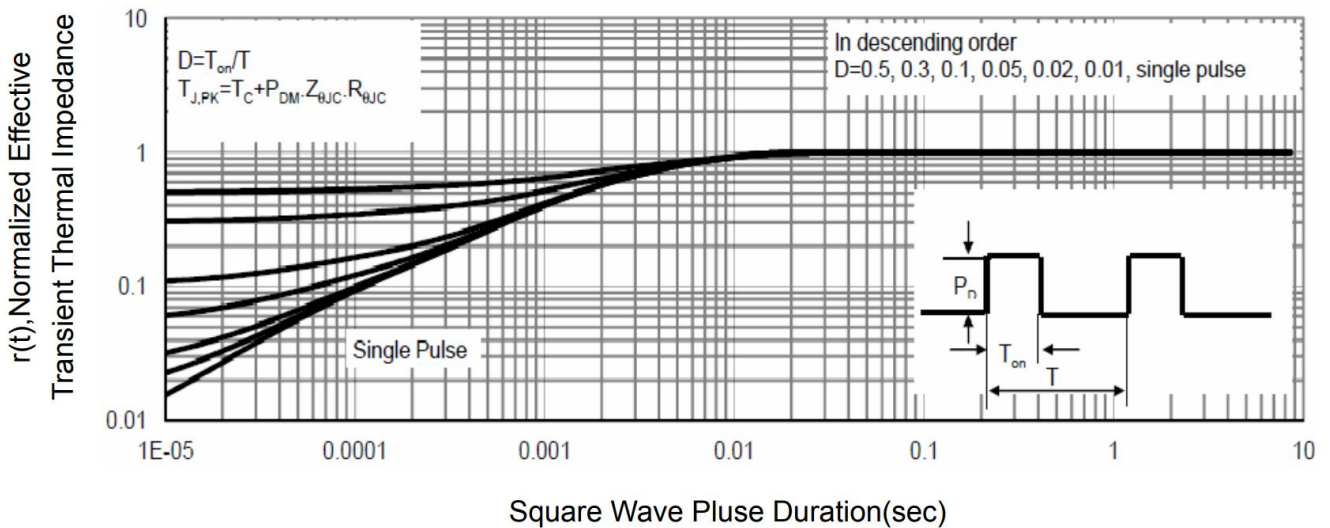
**Figure 8 Safe Operation Area**



**Figure 9 Current De-rating**

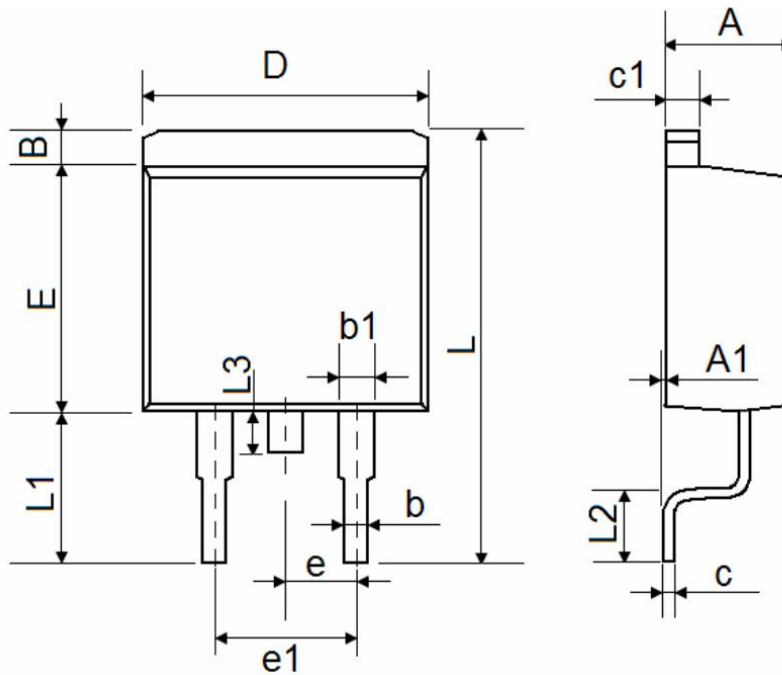


**Figure 10 Power De-rating**



**Figure 11 Normalized Maximum Transient Thermal Impedance**

### TO-263AB Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.200	4.670	0.165	0.184
A1	0.000	0.250	0.000	0.010
B	1.360 REF.		0.054 REF.	
b	0.700	0.910	0.028	0.036
b1	1.170	1.750	0.046	0.069
c	0.310	0.600	0.012	0.024
c1	1.150	1.400	0.045	0.055
D	9.960	10.360	0.392	0.408
E	8.500	9.300	0.335	0.366
e	2.540 BSC.		0.100 BSC.	
e1	5.080 BSC.		0.200 BSC.	
L	14.610	15.880	0.575	0.625
L1	4.400	6.000	0.173	0.236
L2	1.780	2.790	0.070	0.110
L3	1.500 REF.		0.059 REF.	