

### Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	$I_D$
100V	8.5mΩ@10V	78A
	12.0mΩ@4.5V	

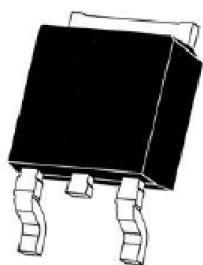
### Feature

- High density cell design for ultra low Rdson
- Fully characterized avalanche voltage and current
- Good stability and uniformity with high E<sub>AS</sub>
- Excellent package for good heat dissipation
- Suffix "-Q1" for AEC-Q101

### Application

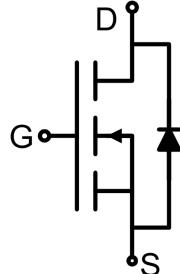
- DC/DC Converter
- Ideal for high-frequency switching and synchronous rectification

### Package

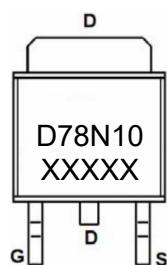


TO-252AB

### Circuit diagram



### Marking



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

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V <sub>DS</sub>	100	V
Gate-Source Voltage	V <sub>GS</sub>	±20	V
Continuous Drain Current	I <sub>D</sub>	78	A
Pulsed Drain Current	I <sub>DM</sub>	320	A
Power Dissipation	P <sub>D</sub>	125	W
Thermal Resistance, Junction-to-Case	R <sub>θJC</sub>	1.2	°C/W
Single pulse avalanche energy	E <sub>AS</sub>	320	mJ
Junction Temperature	T <sub>J</sub>	150	°C
Storage Temperature	T <sub>STG</sub>	-55 ~ +150	°C

### Electrical characteristics (T<sub>A</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	100			V
Zero gate voltage drain current	I <sub>DSS</sub>	V <sub>DS</sub> = 100V, 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	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250µA	1.2		2.2	V
Drain-source on-resistance <sup>1)</sup>	R <sub>DS(on)</sub>	V <sub>GS</sub> = 10V, I <sub>D</sub> = 39A			8.5	mΩ
		V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 39A			12.0	
Forward transconductance <sup>1)</sup>	g <sub>FS</sub>	V <sub>DS</sub> = 10V, I <sub>D</sub> = 39A	40			S
<b>Dynamic characteristics<sup>2)</sup></b>						
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> = 50V, V <sub>GS</sub> = 0V, f = 1MHz		4200		pF
Output Capacitance	C <sub>oss</sub>			354		
Reverse Transfer Capacitance	C <sub>rss</sub>			23		
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> = 50V, V <sub>GS</sub> = 10V, ID = 39A		65		nC
Gate-Source Charge	Q <sub>gs</sub>			15.3		
Gate-Drain Charge	Q <sub>gd</sub>			9		
Turn-on delay time	t <sub>d(on)</sub>	V <sub>DD</sub> = 50V, V <sub>GS</sub> = 10V, I <sub>D</sub> = 39A, R <sub>GEN</sub> = 4.7Ω		15		nS
Turn-on rise time	t <sub>r</sub>			10		
Turn-off delay time	t <sub>d(off)</sub>			41		
Turn-off fall time	t <sub>f</sub>			6		
<b>Source-Drain Diode characteristics</b>						
Diode Forward Current <sup>1)</sup>	I <sub>S</sub>				78	A
Diode Forward voltage	V <sub>DS</sub>	V <sub>GS</sub> = 0V, I <sub>S</sub> = 78A			1.2	V
Reverse Recovery Time	t <sub>rr</sub>	T <sub>J</sub> = 25°C, IF = 78A di/dt = 100A/µs <sup>1)</sup>		101		nS
Reverse Recovery Charge	Q <sub>rr</sub>			193		nC

Notes:

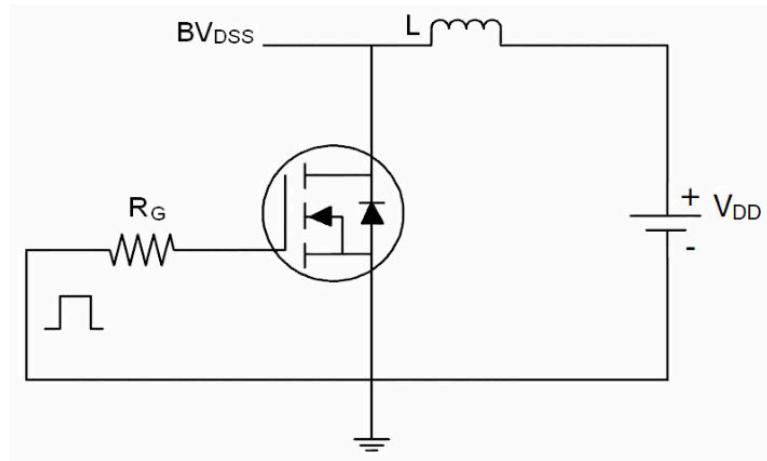
1) Pulse Test: Pulse Width < 300µs, Duty Cycle ≤ 2%.

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

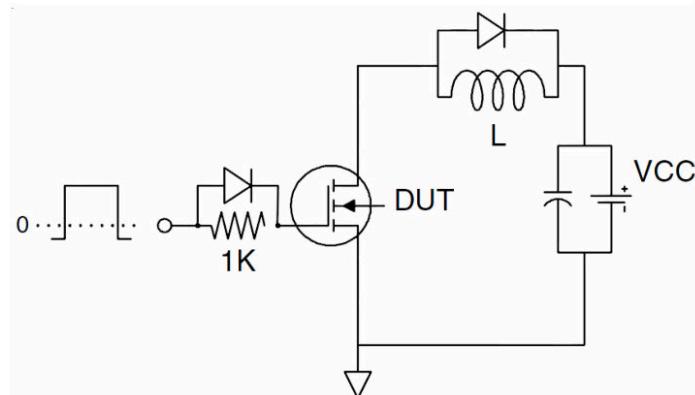


## Test Circuit

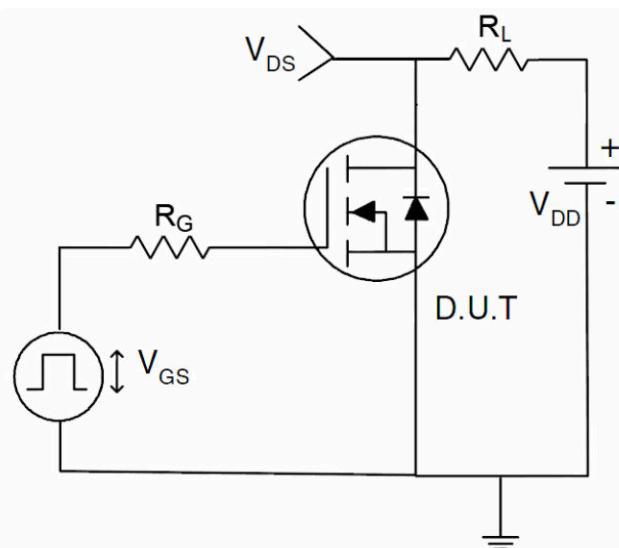
### 1) E<sub>AS</sub> test Circuit



### 2) Gate charge test Circuit



### 3) Switch Time Test Circuit



## Typical Characteristics

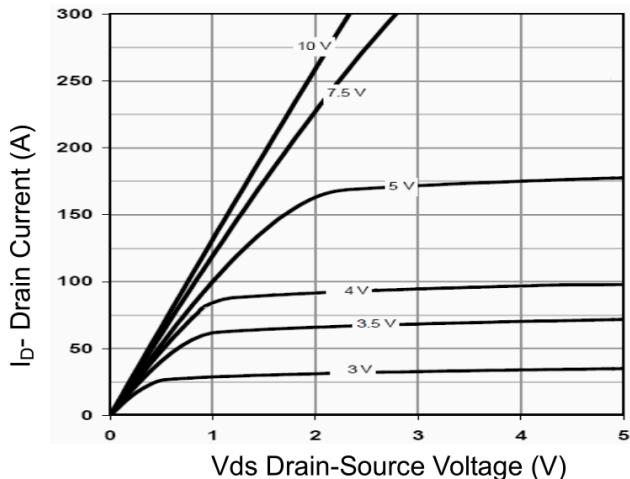


Figure 1 Output Characteristics

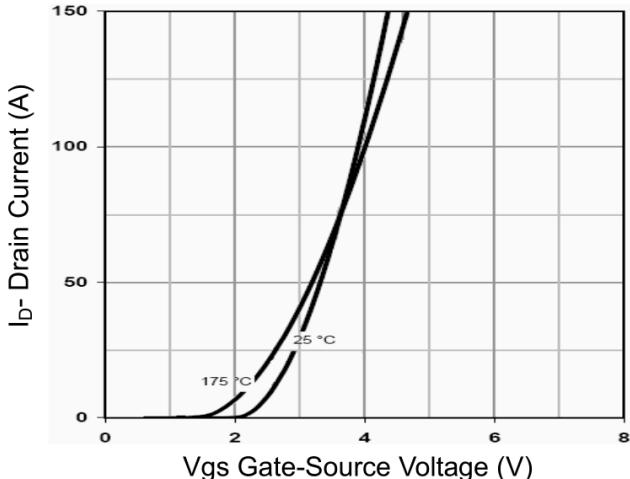


Figure 2 Transfer Characteristics

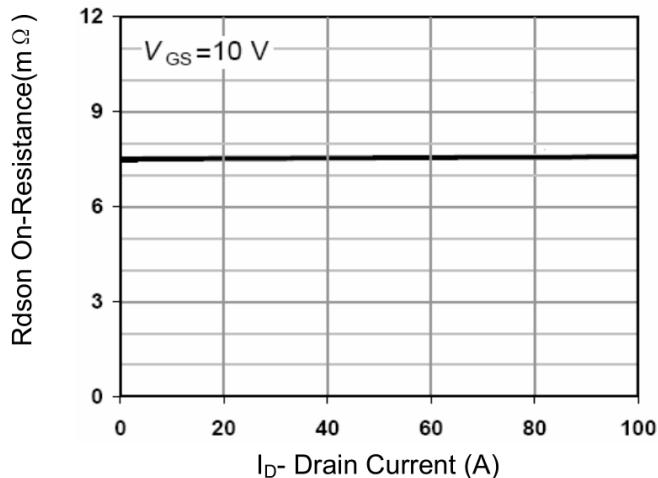


Figure 3 Rdson - Drain Current

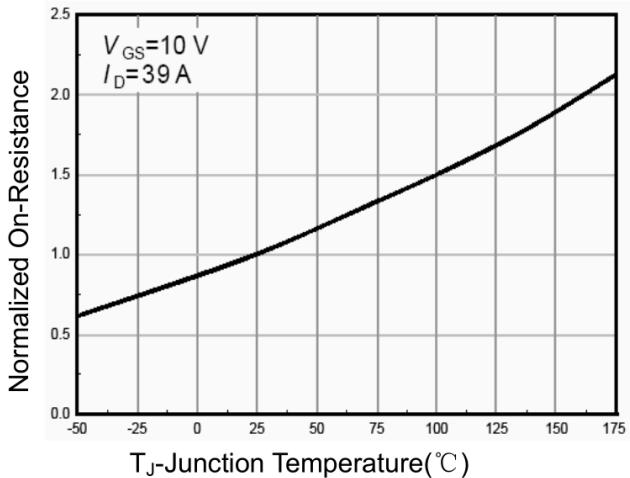


Figure 4 Rdson-JunctionTemperature

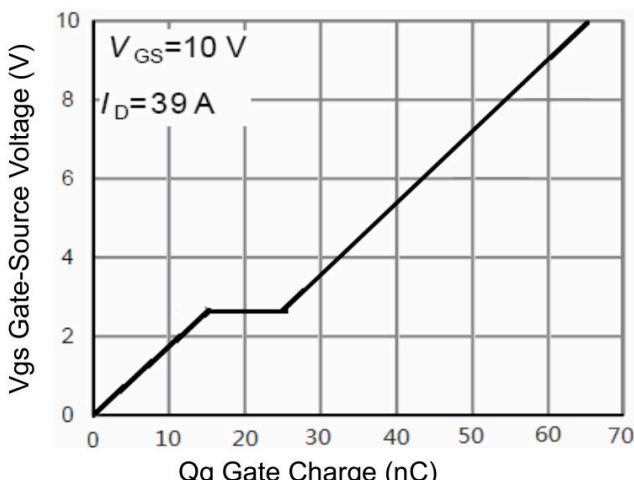


Figure 5 Gate Charge

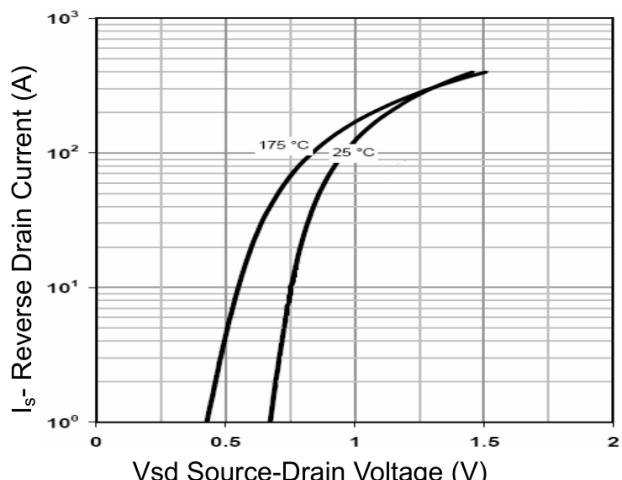


Figure 6 Source- Drain Diode Forward

## Typical Characteristics

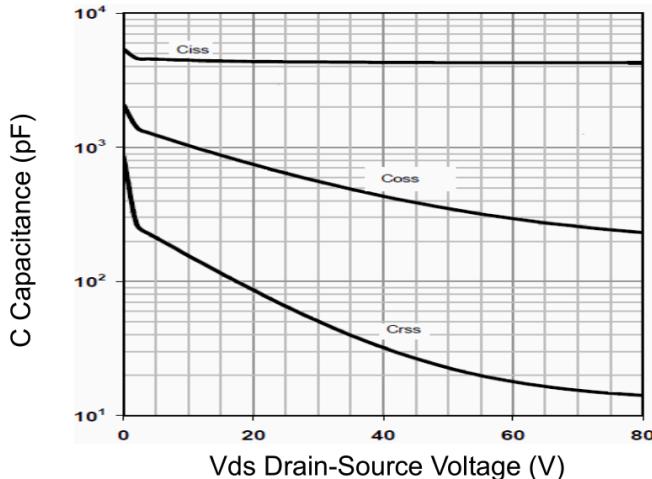


Figure 7 Capacitance vs Vds

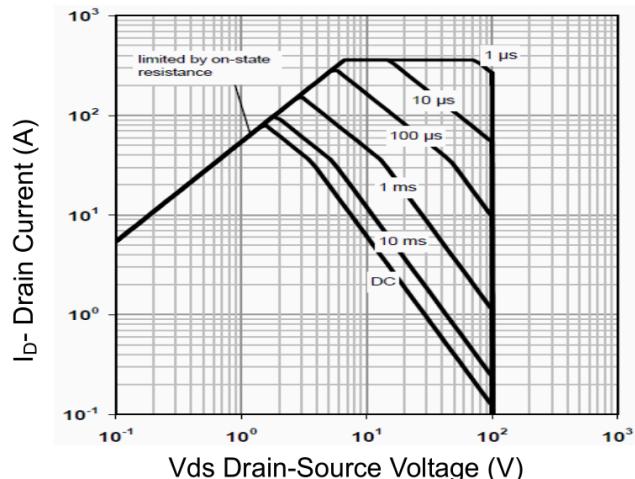


Figure 8 Safe Operation Area

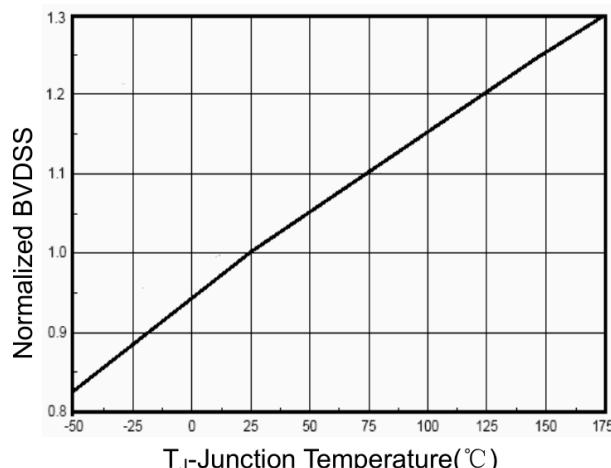


Figure 9 BV<sub>DSS</sub> vs Junction Temperature

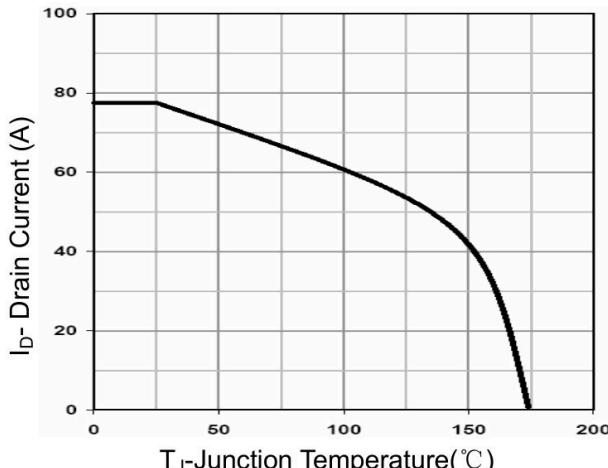


Figure 10 Current De-rating

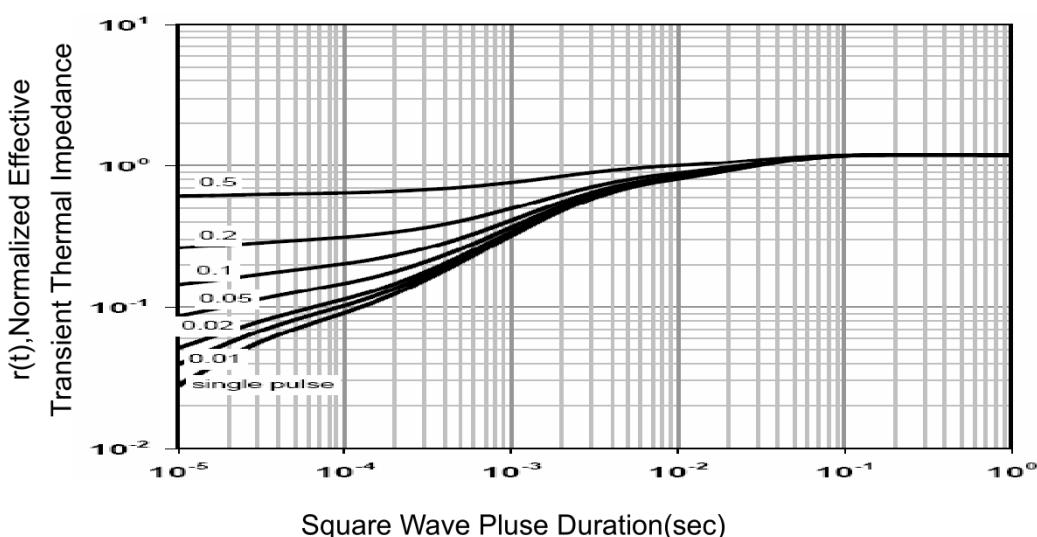
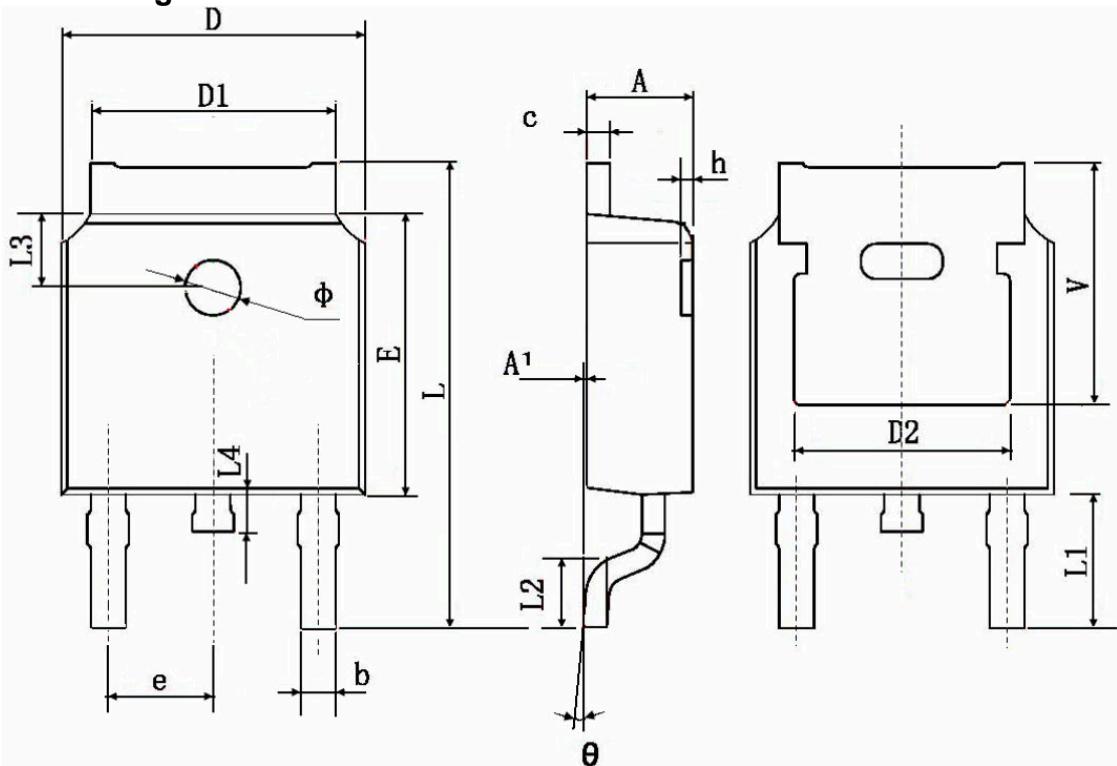


Figure 11 Normalized Maximum Transient Thermal Impedance

## TO-252AB Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.200	2.400	0.087	0.094
A1	0.000	0.127	0.000	0.005
b	0.660	0.860	0.026	0.034
c	0.460	0.580	0.018	0.023
D	6.500	6.700	0.256	0.264
D1	5.100	5.460	0.201	0.215
D2	4.830 TYP.		0.190 TYP.	
E	6.000	6.200	0.236	0.244
e	2.186	2.386	0.086	0.094
L	9.800	10.400	0.386	0.409
L1	2.900 TYP.		0.114 TYP.	
L2	1.400	1.700	0.055	0.067
L3	1.600 TYP.		0.063 TYP.	
L4	0.600	1.000	0.024	0.039
$\Phi$	1.100	1.300	0.043	0.051
$\theta$	0°	8°	0°	8°
h	0.000	0.300	0.000	0.012
V	5.350 TYP.		0.211 TYP.	