

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
40V	7mΩ@10V	80A

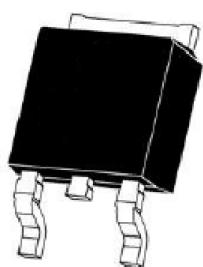
Feature

- 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

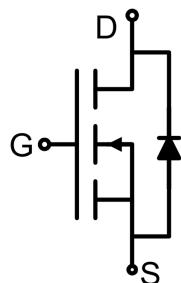
- PWM
- Load switching

Package

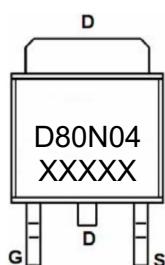


TO-252AB

Circuit diagram



Marking



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

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V _{DS}	40	V
Gate-Source Voltage	V _{GS}	±20	V
Continuous Drain Current	I _D	80	A
Pulsed Drain Current	I _{DM}	350	A
Power Dissipation	P _D	80	W
Thermal Resistance,Junction-to-Case	R _{θJC}	1.88	°C/W
Single pulse avalanche energy	E _{AS}	750	mJ
Junction Temperature	T _J	150	°C
Storage Temperature	T _{STG}	-55 ~ +150	°C

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	40			V
Zero gate voltage drain current	I _{DSS}	V _{DS} = 40V, 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	1.2		2.5	V
Drain-source on-resistance ¹⁾	R _{DS(on)}	V _{GS} = 10V, I _D = 20A			7	mΩ
Dynamic characteristics²⁾						
Input Capacitance	C _{iss}	V _{DS} = 20V, V _{GS} = 0V, f = 1MHz		2662		pF
Output Capacitance	C _{oss}			322		
Reverse Transfer Capacitance	C _{rss}			246		
Total Gate Charge	Q _g	V _{DS} = 20V, V _{GS} = 10V, ID = 20A		55		nC
Gate-Source Charge	Q _{gs}			6.9		
Gate-Drain Charge	Q _{gd}			14.5		
Turn-on delay time	t _{d(on)}	V _{DD} = 20V, V _{GS} = 10V, R _L = 1Ω, R _{GEN} = 3Ω		12		nS
Turn-on rise time	t _r			11		
Turn-off delay time	t _{d(off)}			39		
Turn-off fall time	t _f			12		
Source-Drain Diode characteristics						
Diode Forward Current ¹⁾	I _S				80	A
Diode Forward voltage	V _{DS}	V _{GS} = 0V, I _S = 10A			1.2	V
Reverse Recovery Time	t _{rr}	T _J = 25°C, IF = 20A di/dt = 100A/µs ¹⁾			45	nS
Reverse Recovery Charge	Q _{rr}				50	nC

Notes:

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

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



Typical Characteristics

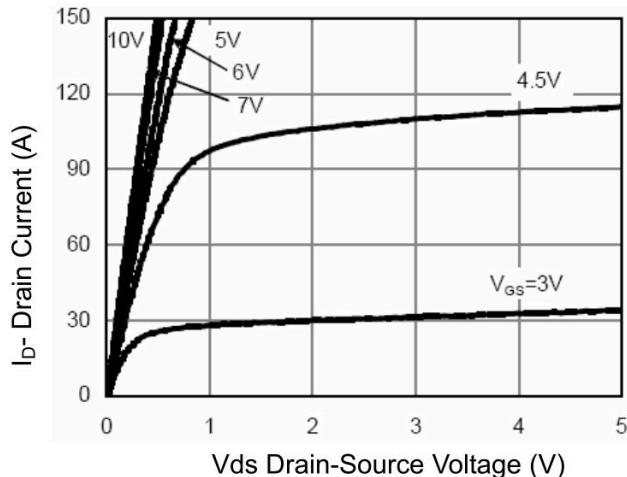


Figure 1 Output Characteristics

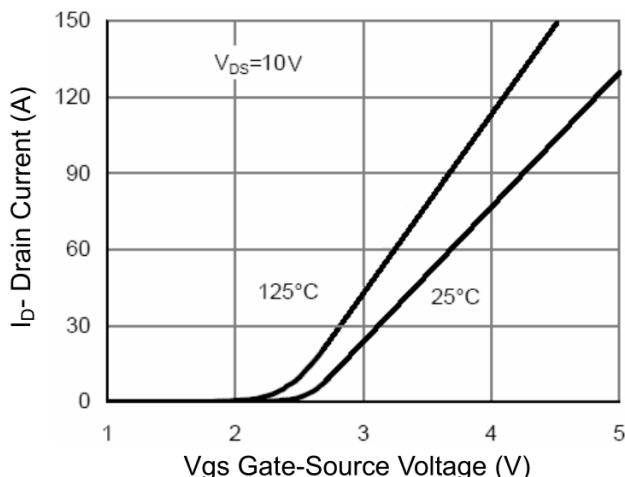


Figure 2 Transfer Characteristics

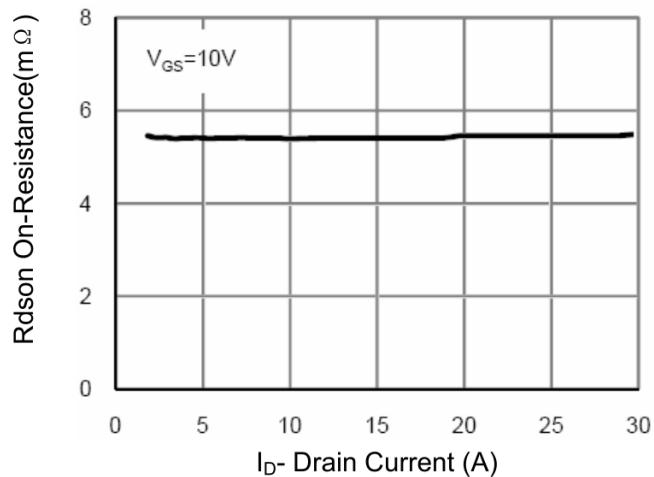


Figure 3 $R_{DS(on)}$ - Drain Current

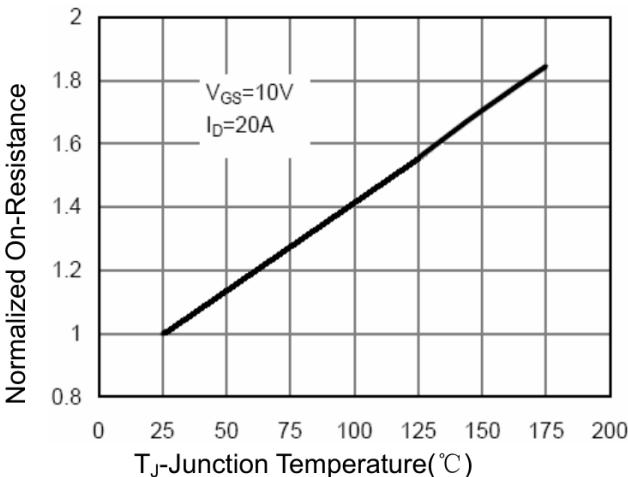


Figure 4 $R_{DS(on)}$ -JunctionTemperature

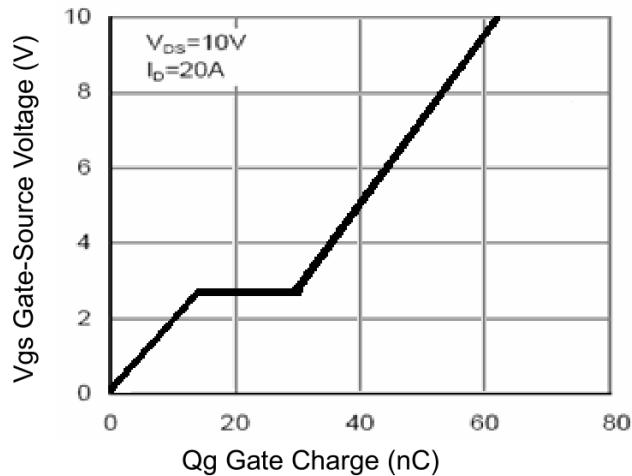


Figure 5 Gate Charge

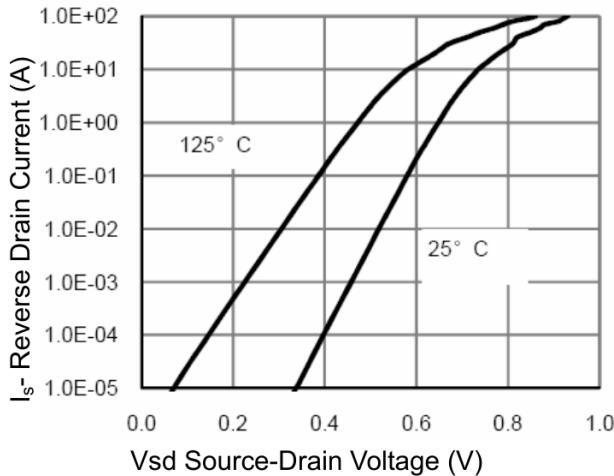


Figure 6 Source- Drain Diode Forward

Typical Characteristics

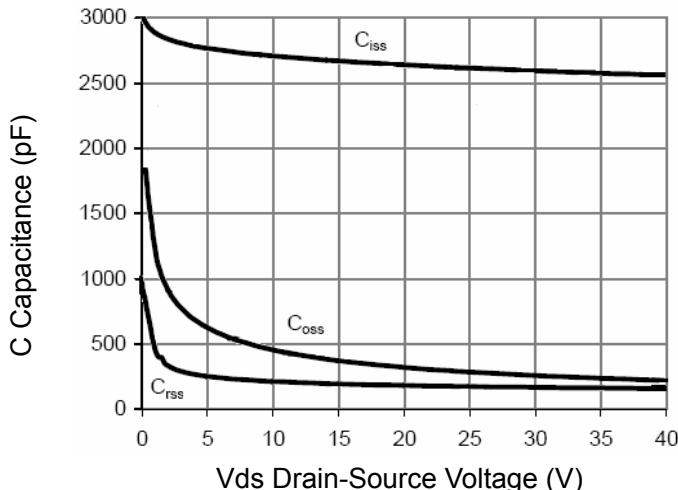


Figure 7 Capacitance vs Vds

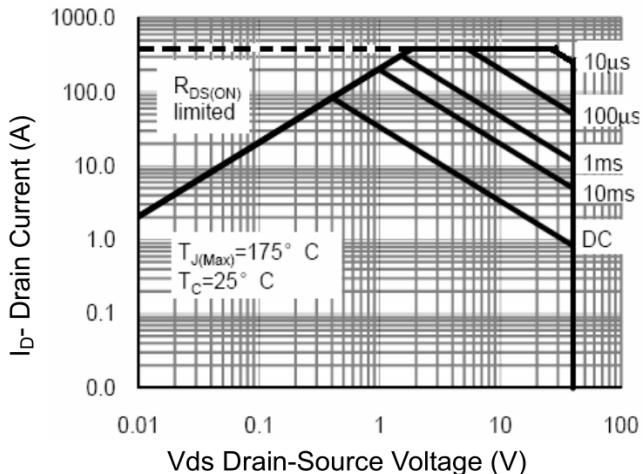


Figure 8 Safe Operation Area

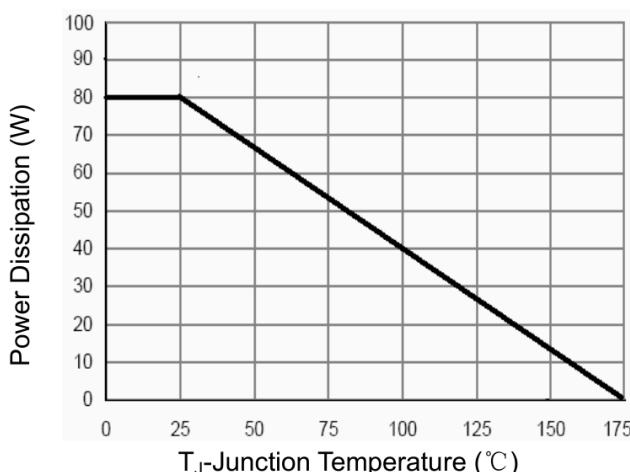


Figure 9 Power De-rating

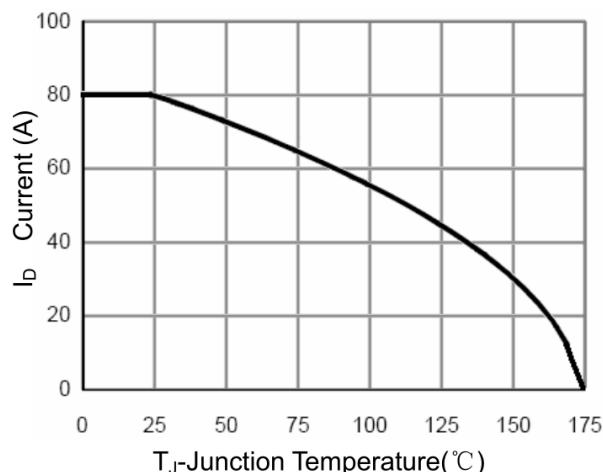


Figure 10 ID Current- Junction Temperature

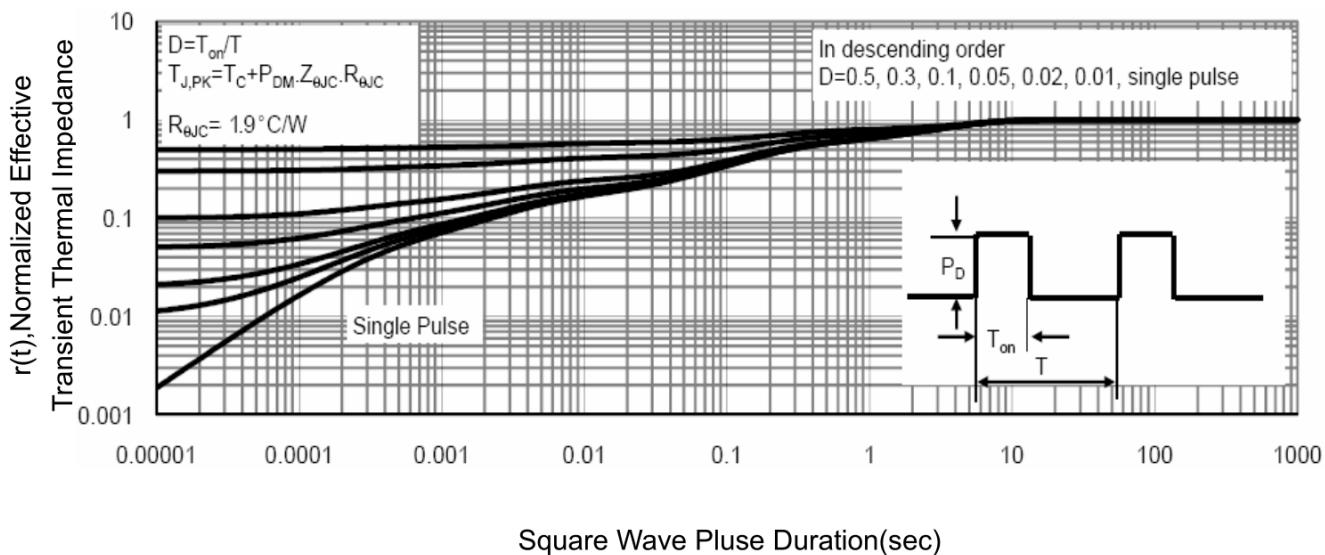
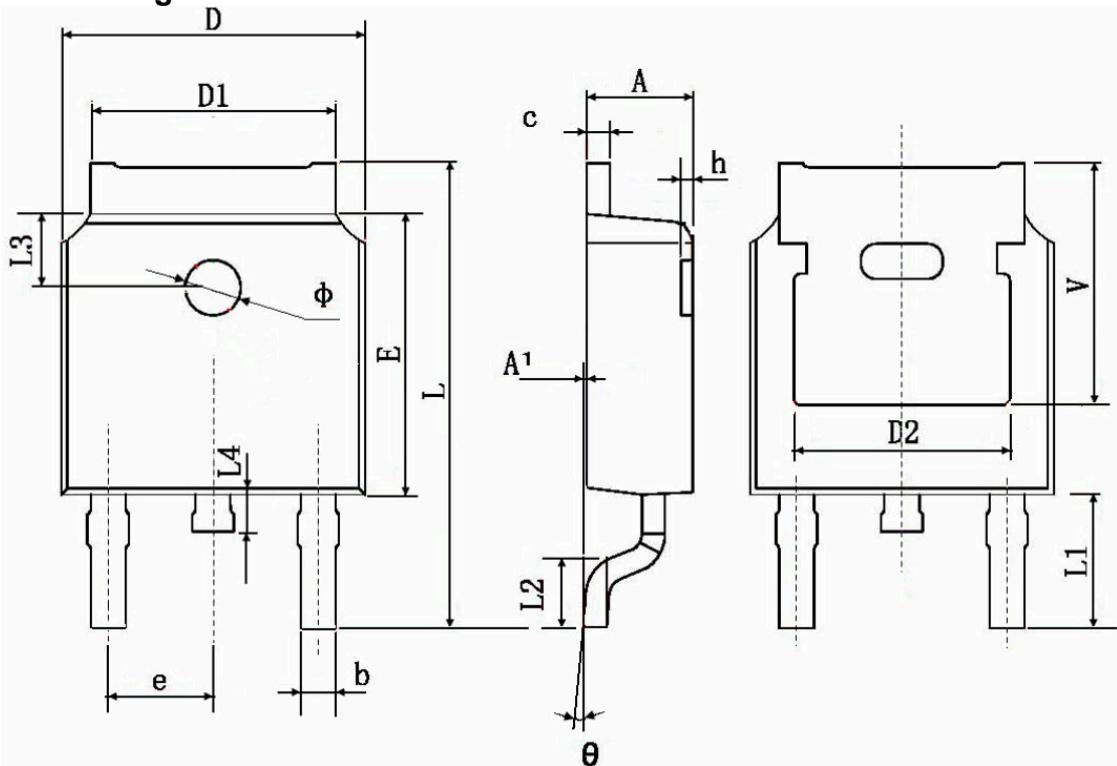


Figure 11 Normalized Maximum Transient Thermal Impedance

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
Φ	1.100	1.300	0.043	0.051
θ	0°	8°	0°	8°
h	0.000	0.300	0.000	0.012
V	5.350 TYP.		0.211 TYP.	