

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
700V	1400mΩ@10V	3.5A

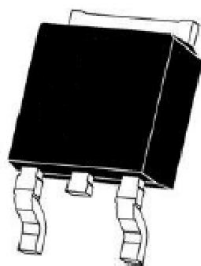
Feature

- Optimized body diode reverse recovery performance
- Low on-resistance and low conduction losses
- Ultra Low Gate Charge cause lower driving requirements
- Suffix "-Q1" for AEC-Q101

Application

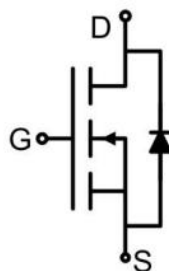
- Power factor correction (PFC)
- Switched mode power supplies(SMPS)
- Uninterruptible Power Supply (UPS)
- LLC Half-bridge

Package



TO-252AB

Circuit diagram



Marking



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

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	700	V
Gate-Source Voltage, AC ($f > 1$ Hz)	V_{GS}	± 30	V
Gate-Source Voltage, DC	V_{GS}	± 20	V
Continuous Drain Current	I_D	3.5	A
Continuous Drain Current ($T_C = 100^\circ\text{C}$)	$I_D(100^\circ\text{C})$	2.45	A
Pulsed Drain Current ¹⁾	I_{DM}	10.5	A
Power Dissipation	P_D	46	W
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	3.26	$^\circ\text{C/W}$
Single pulse avalanche current ²⁾	I_{AS}	1.0	A
Junction Temperature	T_J	175	$^\circ\text{C}$
Storage Temperature Range	T_{STG}	-55 ~ +175	$^\circ\text{C}$

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	700			V
Zero gate voltage drain current(T _C =25°C)	I _{DSS}	V _{DS} =700V,V _{GS} = 0V			1	μA
Zero gate voltage drain current(T _C =125°C)	I _{DSS}	V _{DS} =700V,V _{GS} = 0V			50	μA
Gate-body leakage current	I _{GSS}	V _{GS} =±20V, V _{DS} = 0V			±200	nA
Gate threshold voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	3		4	V
Drain-source on-resistance	R _{DS(on)}	V _{GS} =10V, I _D =1.7A		1200	1400	mΩ
Dynamic characteristics ³⁾						
Input Capacitance	C _{iss}	V _{DS} =50V,V _{GS} =0V, f =1MHz		281		pF
Output Capacitance	C _{oss}			17		
Reverse Transfer Capacitance	C _{rss}			4		
Gate Resistance	R _g	f =1MHz,D-S short		36		Ω
Total Gate Charge	Q _g	V _{DS} =500V,V _{GS} =10V, I _D =1.7A		5		nC
Gate-Source Charge	Q _{gs}			0.5		
Gate-Drain Charge	Q _{gd}			0.9		
Gate Plateau Voltage	V _{gp}			4.8		V
Turn-on delay time	t _{d(on)}	V _{DD} =500V,V _{GS} =10V, I _D =1.7A,R _G =4Ω		9		nS
Turn-on rise time	t _r			6		
Turn-off delay time	t _{d(off)}			50		
Turn-off fall time	t _f			9		
Source-Drain Diode characteristics						
Diode Forward voltage	V _{SD}	V _{GS} =0V,I _S =3.5A,T _j =25°C			1.1	V
Diode Forward Current	I _{SD}	T _C =25°C			3.5	A
Pulsed-Source-drain current(Body Diode)	I _{SDM}				10.5	A
Reverse Recovery Time	t _{rr}	T _j = 25°C, I _F = 1.7A di/dt = 100A/μs		190		nS
Reverse Recovery Charge	Q _{rr}			0.57		uC
Peak reverse recovery current	I _{rrm}			6		A

Notes:

1) Repetitive Rating: Pulse width limited by maximum junction temperature.

2) $T_J = 25^\circ\text{C}, V_{DD} = 50V, V_G = 10V, R_G = 25\Omega$.

3) Guaranteed by design, not subject to production.

Typical Characteristics

Figure1. Safe operating area

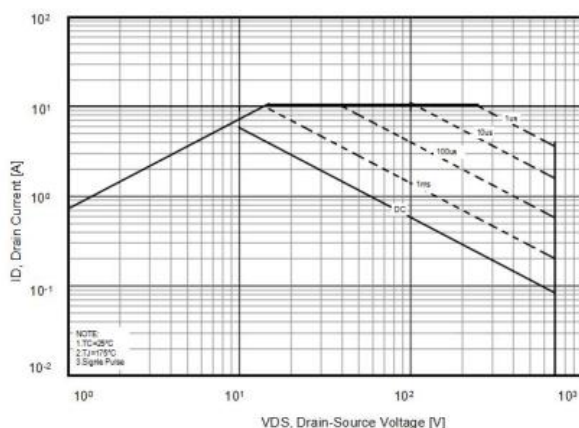


Figure2. Source-Drain Diode Forward Voltage

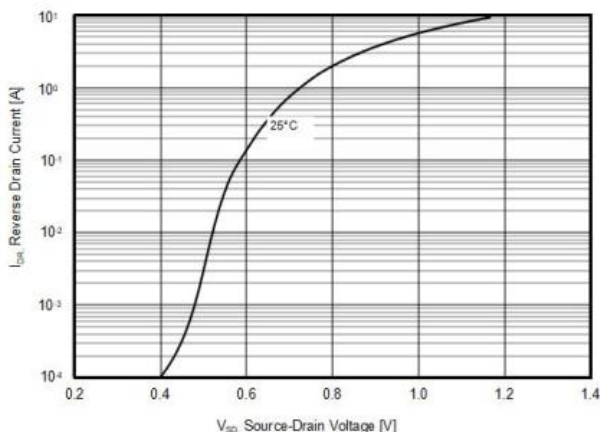


Figure3. Output characteristics

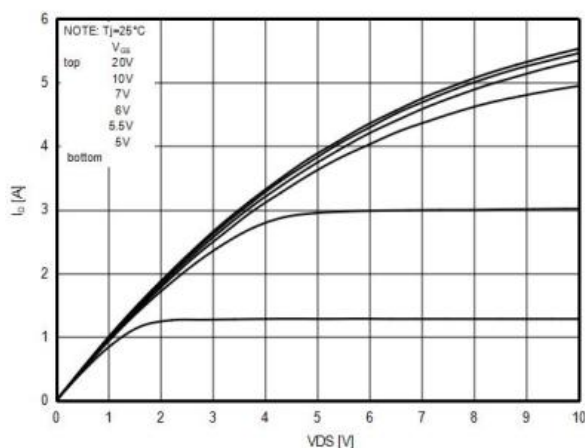


Figure4. Transfer characteristics

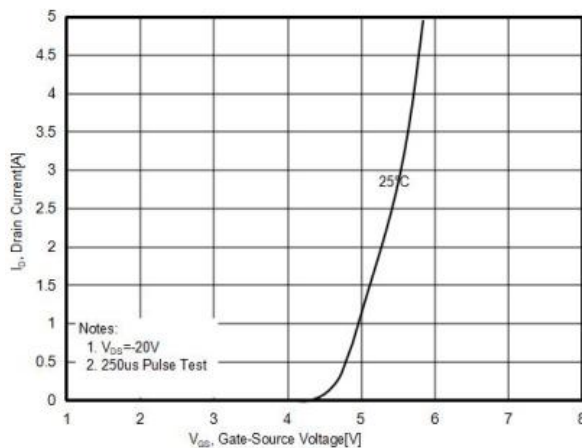


Figure5. Static drain-source on resistance

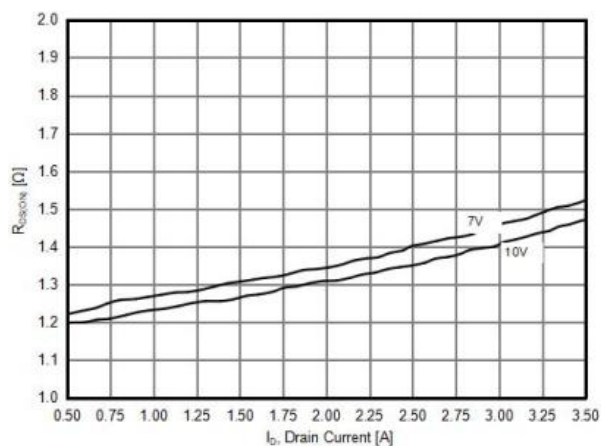
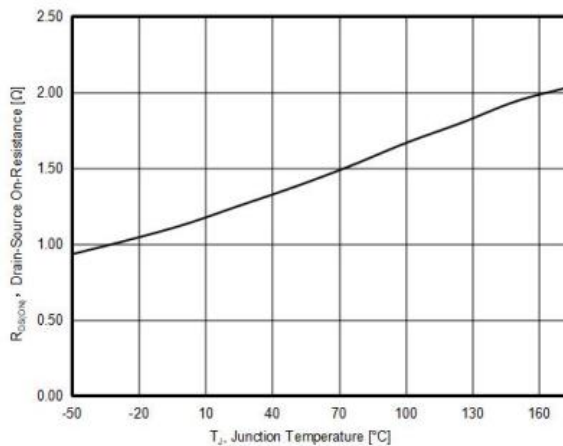


Figure6. $R_{DS(ON)}$ vs Junction Temperature



Typical Characteristics

Figure7. BV_{DSS} vs Junction Temperature

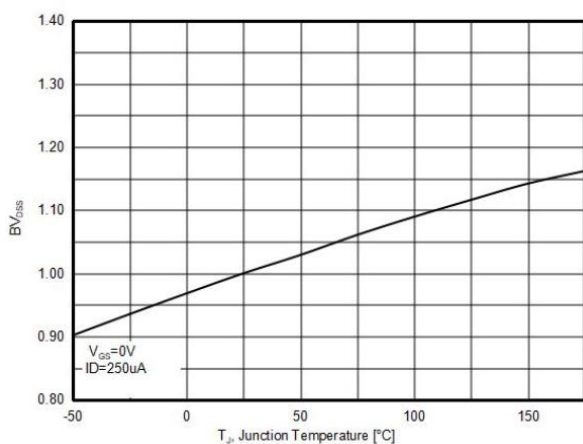


Figure8. Maximum I_D vs Junction Temperature

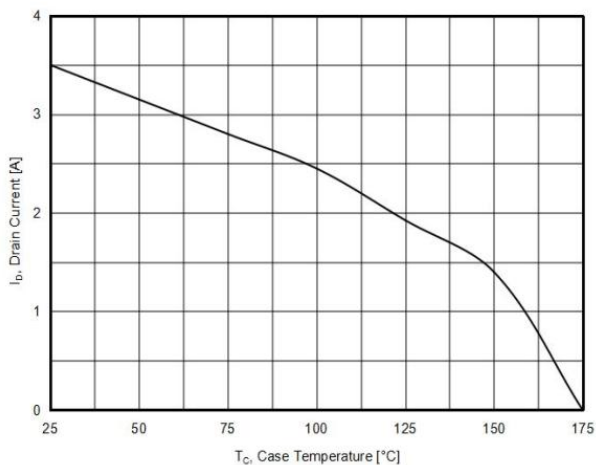


Figure9. Gate charge waveforms

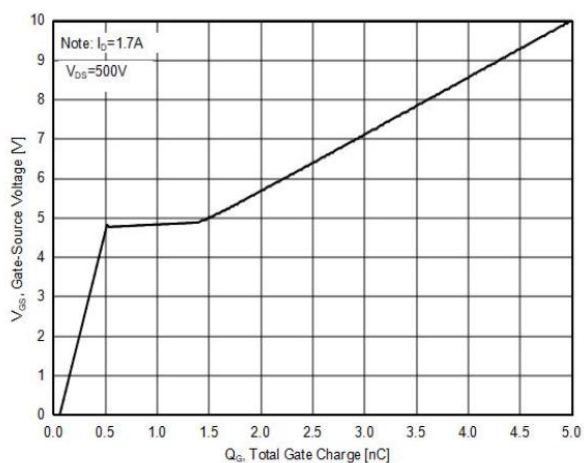
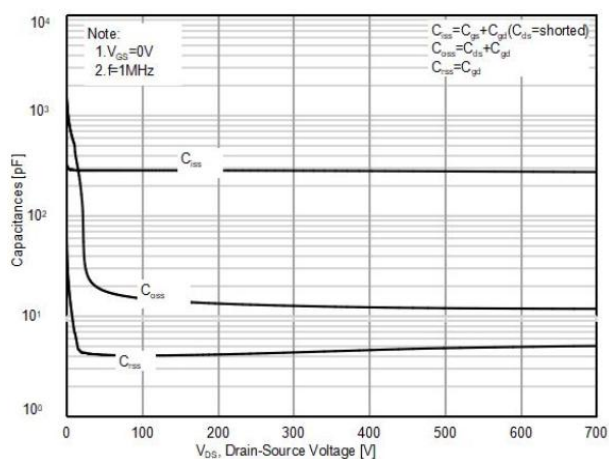
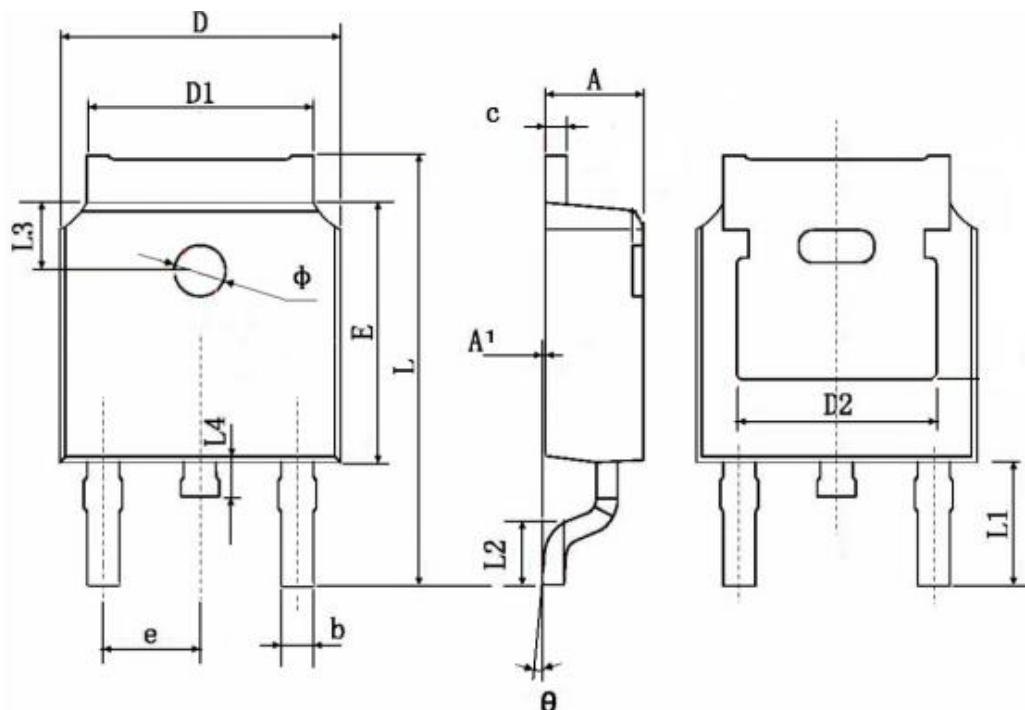


Figure10. Capacitance



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	0.130	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	5.500	0.201	0.217
D2	4.830 REF.		0.190 REF.	
E	6.000	6.200	0.236	0.244
e	2.186	2.390	0.086	0.094
L	9.800	10.500	0.386	0.413
L1	2.900 REF.		0.114 REF.	
L2	1.400	1.800	0.055	0.070
L3	1.600 REF.		0.063 REF.	
L4	0.600	1.000	0.024	0.039
Φ	1.100	1.300	0.043	0.051
θ	0°	8°	0°	8°