

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
100V	12mΩ@10V	60A
	15mΩ@4.5V	

Feature

- Avalanche energy tested
- Low gate charge
- Fast switching capability
- Suffix "-Q1" for AEC-Q101

Application

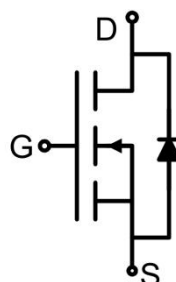
- Power factor correction
- Switched mode power supplies
- Uninterruptible power supply

Package

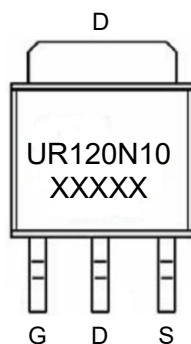


TO-251AB

Circuit diagram



Marking



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

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V _{DS}	100	V
Gate-Source Voltage	V _{GS}	±20	V
Continuous Drain Current (T _C =25°C)	I _D	60	A
Continuous Drain Current (T _C =100°C)	I _D (100°C)	37	A
Pulsed Drain Current ¹⁾	I _{DM}	170	A
Power Dissipation ³⁾ (T _C =25°C)	P _D	73	W
Thermal Resistance, Junction-to-Ambient ⁴⁾	R _{θJA}	50	°C/W
Thermal Resistance, Junction-to-Case	R _{θJC}	1.7	°C/W
Single pulse avalanche energy ²⁾	E _{AS}	82	mJ
Junction Temperature	T _J	150	°C
Storage Temperature	T _{STG}	-55 ~ +150	°C

Electrical characteristics (T_J=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	100			V
Zero gate voltage drain current	I _{DSS}	V _{DS} =100V,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	1.0	1.7	3.0	V
Drain-source on-resistance	R _{DS(on)}	V _{GS} =10V, I _D =30A		8.8	12	mΩ
		V _{GS} =4.5V, I _D =20A		11	15	
Dynamic characteristics ⁵⁾						
Input Capacitance	C _{iss}	V _{DS} =50V,V _{GS} =0V,f =1MHz		1800		pF
Output Capacitance	C _{oss}			590		
Reverse Transfer Capacitance	C _{rss}			20		
Total Gate Charge	Q _g	V _{DS} =50V,V _{GS} =10V,I _D =30A		30		nC
Gate-Source Charge	Q _{gs}			9		
Gate-Drain Charge	Q _{gd}			4		
Turn-on delay time	t _{d(on)}	V _{DD} =50V, V _{GS} =10V, I _D =30A,R _{GEN} =3Ω		13		nS
Turn-on rise time	t _r			52		
Turn-off delay time	t _{d(off)}			26		
Turn-off fall time	t _f			77		
Source-Drain Diode characteristics						
Diode Forward Current	I _S				60	A
Diode Forward voltage	V _{SD}	V _{GS} =0V, I _S =30A			1.4	V
Reverse Recovery Time	t _{rr}	I _F =30A,di/dt = 100A/μs		35		nS
Reverse Recovery Charge	Q _{rr}			26		nC

Notes:

- 1) Repetitive rating; pulse width limited by max. junction temperature.
- 2) T_J=25°C, V_{DD}=50V, V_G=10V, R_G=25Ω, L=0.5mH, I_{AS}=18.2A.
- 3) P_D is based on max. junction temperature, using junction-case thermal resistance.
- 4) The value of R_{θJA} is measured with the device mounted on 1 in² FR-4 board with 2oz. Copper, in the still air environment with T_A = 25°C. The maximum allowed junction temperature of 150°C. The value in any given application depends on the user's specific board design.
- 5) Guaranteed by design, not subject to production testing.

Typical Characteristics

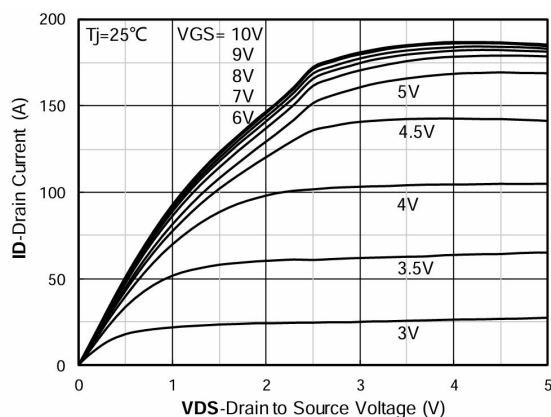


Figure 1. Output Characteristics

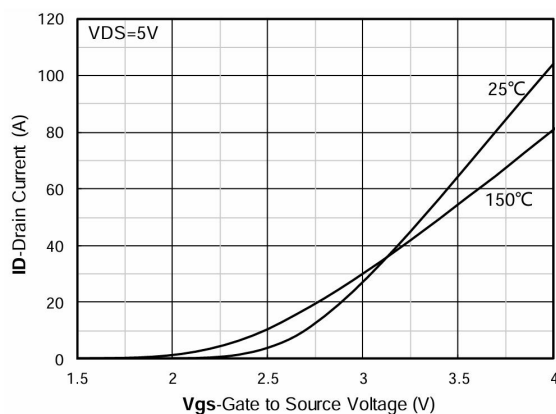


Figure 2. Transfer Characteristics

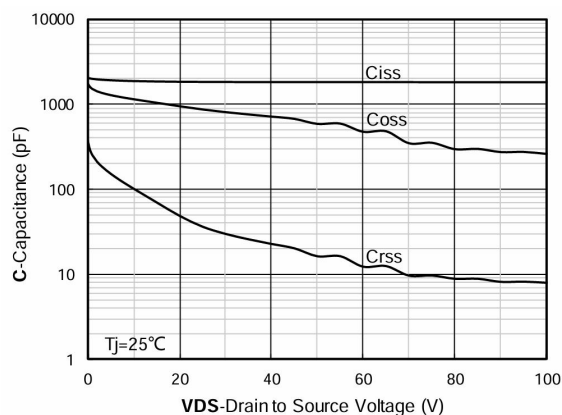


Figure 3. Capacitance Characteristics

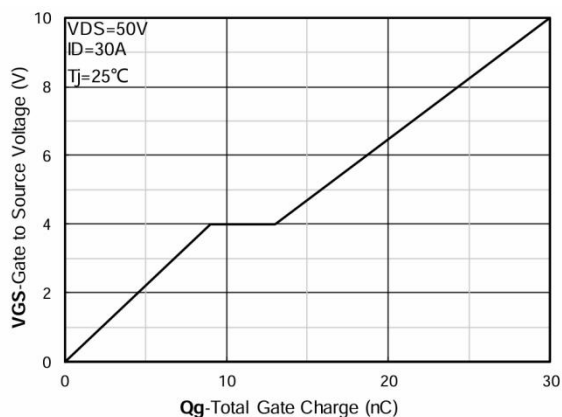


Figure 4. Gate Charge

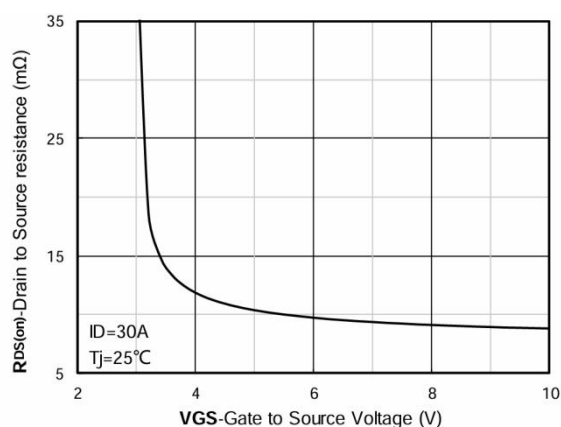


Figure 5. On-Resistance vs Gate to Source Voltage

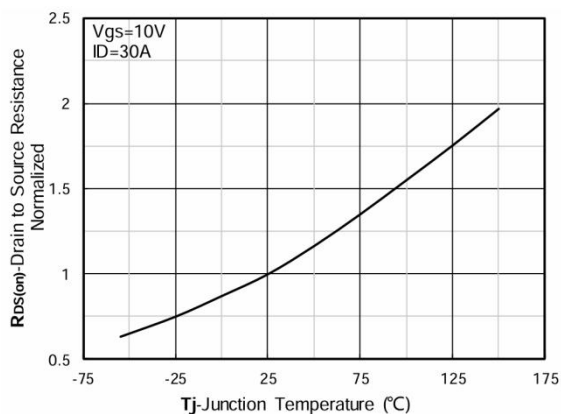


Figure 6. Normalized On-Resistance

Typical Characteristics

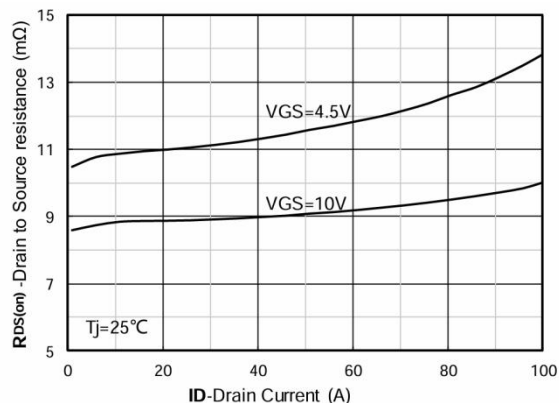


Figure 7. RDS(on) VS Drain Current

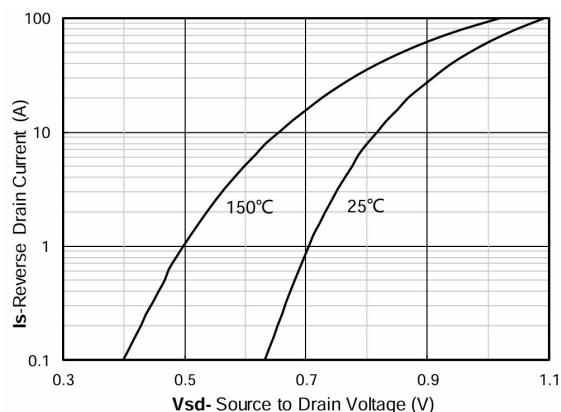


Figure 8. Forward characteristics of reverse diode

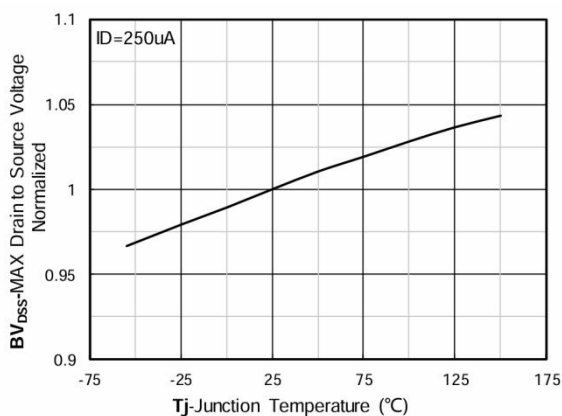


Figure 9. Normalized breakdown voltage

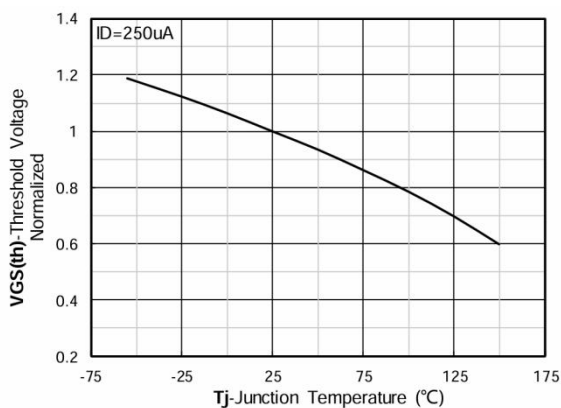


Figure 10. Normalized Threshold voltage

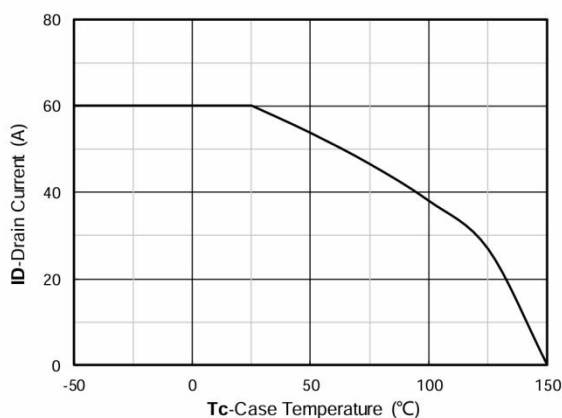


Figure 11. Current dissipation

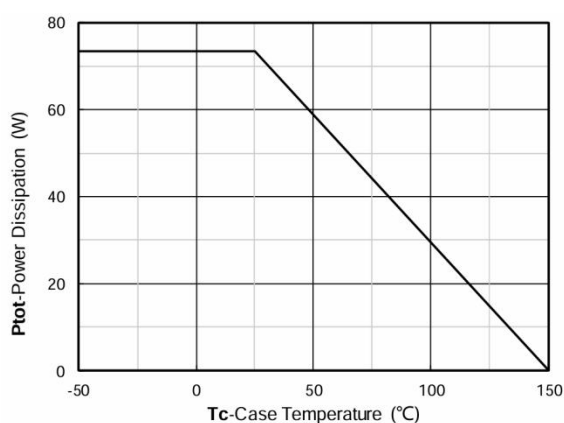


Figure 12. Power dissipation

Typical Characteristics

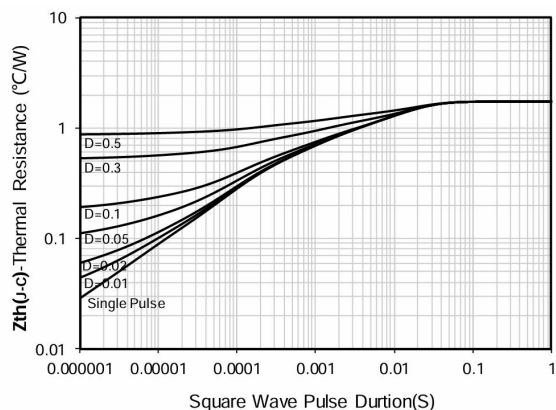


Figure 13. Maximum Transient Thermal Impedance

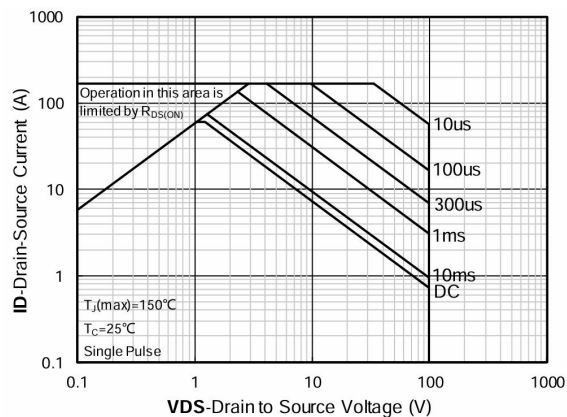
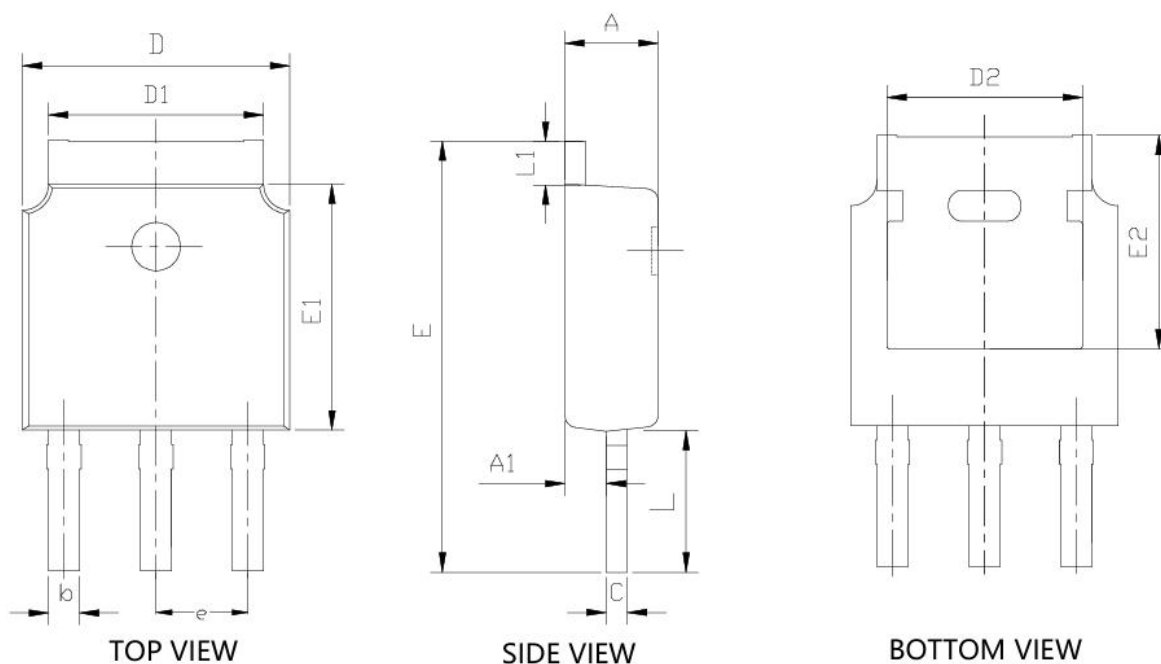


Figure 14. Safe Operation Area

TO-251AB Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.200	2.400	0.087	0.094
A1	0.900	1.100	0.035	0.043
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	5.150	5.450	0.203	0.215
D2	4.600	4.950	0.181	0.195
E	10.400	11.500	0.409	0.453
E1	6.000	6.200	0.236	0.244
E2	5.400 REF.		0.213 REF.	
e	2.286 BSC.		0.090 BSC.	
L	3.500	4.300	0.138	0.169
L1	0.900	1.270	0.035	0.050