

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
100V	140mΩ@10V	6A

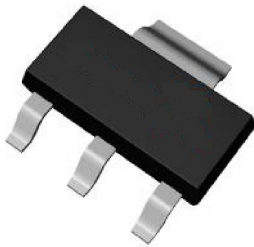
Feature

- High density cell design for ultra low Rdson
- Fully characterized avalanche voltage and current
- Excellent package for good heat dissipation
- Suffix "-Q1" for AEC-Q101

Application

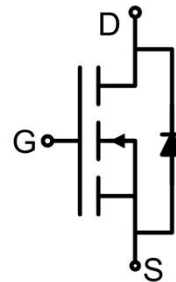
- Power switching application
- Hard switched and high frequency circuits
- Uninterruptible power supply

Package



SOT-223

Circuit diagram



Marking



Absolute maximum ratings (Ta=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	I_D	6	A
Continuous Drain Current($T_C=100^\circ\text{C}$)	$I_{D(100^\circ\text{C})}$	4.2	A
Pulsed Drain Current ¹⁾	I_{DM}	24	A
Power Dissipation	P_D	3	W
Thermal Resistance from Junction to Case ²⁾	$R_{\theta JC}$	41.7	$^\circ\text{C/W}$
Junction Temperature	T_J	150	$^\circ\text{C}$
Storage Temperature	T_{STG}	-55 ~ +150	$^\circ\text{C}$

Electrical characteristics (Ta=25°C, unless otherwise noted)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 250\mu\text{A}$	100			V
Zero gate voltage drain current	I_{DSS}	$V_{DS} = 100V, V_{GS} = 0V$			1	μA
Gate-body leakage current	I_{GSS}	$V_{GS} = \pm 20V, V_{DS} = 0V$			± 100	nA
Gate threshold voltage ³⁾	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu\text{A}$	1.2	1.8	2.5	V
Drain-source on-resistance ³⁾	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 5A$		103	140	m Ω
Forward Transconductance ³⁾	g_{FS}	$V_{DS} = 10V, I_D = 5A$		15		S
Dynamic characteristics⁴⁾						
Input Capacitance	C_{iss}	$V_{DS} = 50V, V_{GS} = 0V, f = 1\text{MHz}$		542		pF
Output Capacitance	C_{oss}			28.8		
Reverse Transfer Capacitance	C_{rss}			21.8		
Total Gate Charge	Q_g	$V_{DS} = 50V, V_{GS} = 10V, I_D = 5A$		17.4		nC
Gate-Source Charge	Q_{gs}			2.6		
Gate-Drain Charge	Q_{gd}			3.7		
Turn-on delay time	$t_{d(on)}$	$V_{DD} = 50V, V_{GS} = 10V$ $R_L = 15\Omega, R_G = 2.5\Omega$		11		nS
Turn-on rise time	t_r			7.4		
Turn-off delay time	$t_{d(off)}$			35		
Turn-off fall time	t_f			9.1		
Source-Drain Diode characteristics						
Diode Forward Voltage ³⁾	V_{SD}	$V_{GS} = 0V, I_S = 6A$			1.2	V
Diode Forward Current ²⁾	I_S				6	A

Notes:

- 1) Repetitive Rating: Pulse width limited by maximum junction temperature
- 2) Surface Mounted on FR4 Board, $t \leq 10$ sec.
- 3) Pulse Test: Pulse Width $\leq 300\mu\text{s}$, Duty Cycle $\leq 2\%$.
- 4) Guaranteed by design, not subject to production.

Typical Characteristics

Figure1. Source-Drain Diode Forward Voltage

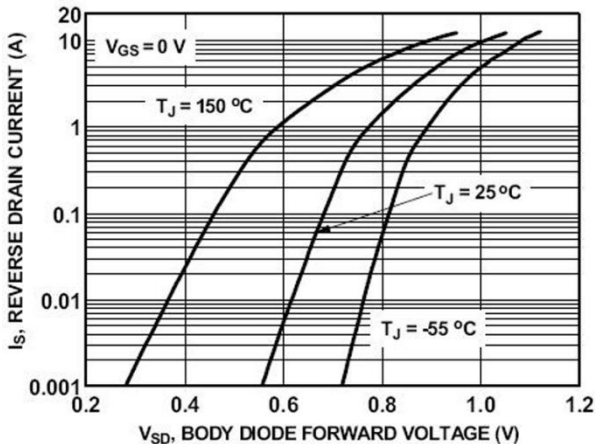


Figure2. Safe operating area

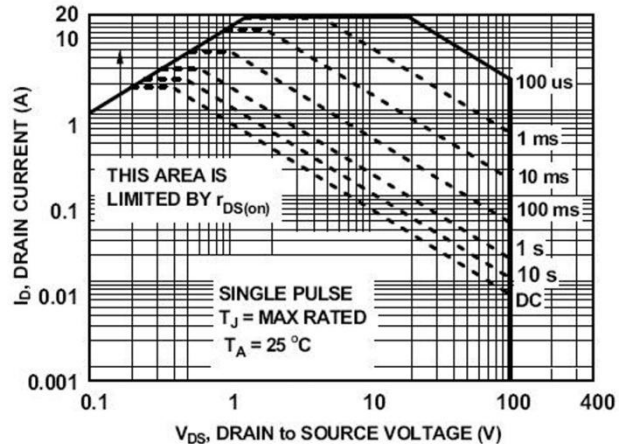


Figure3. Output characteristics

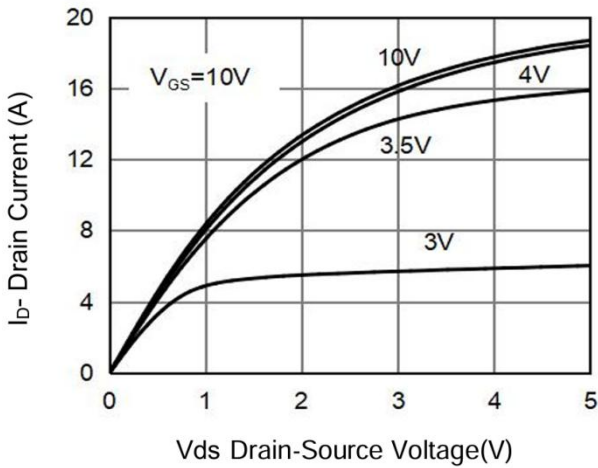


Figure4. Transfer characteristics

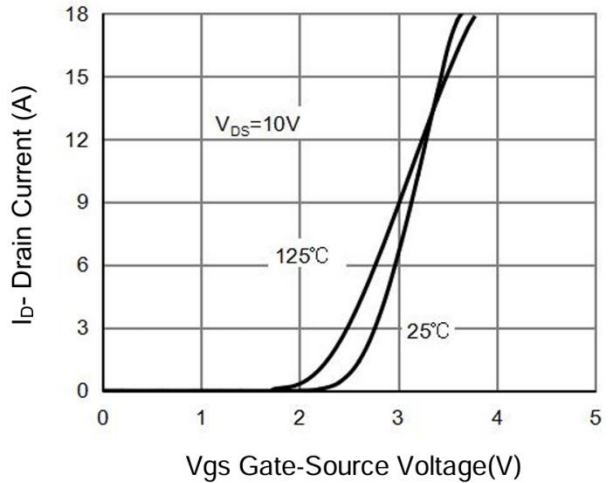


Figure5. Static drain-source on resistance

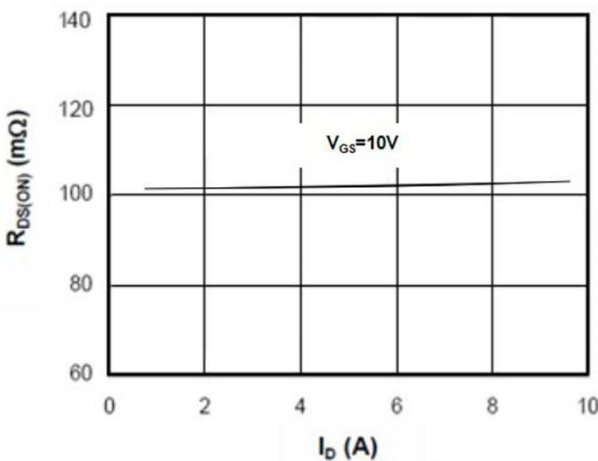
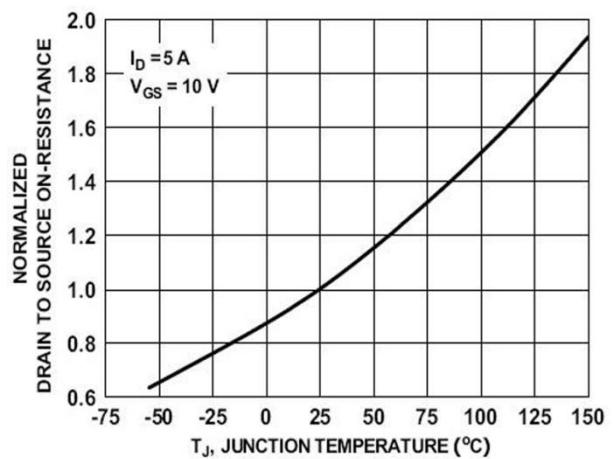


Figure6. $R_{DS(ON)}$ vs Junction Temperature



Typical Characteristics

Figure7. BV_{DSS} vs Junction Temperature

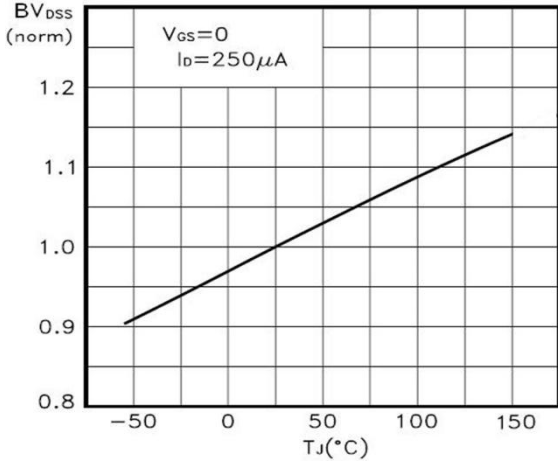


Figure8. $V_{GS(th)}$ vs Junction Temperature

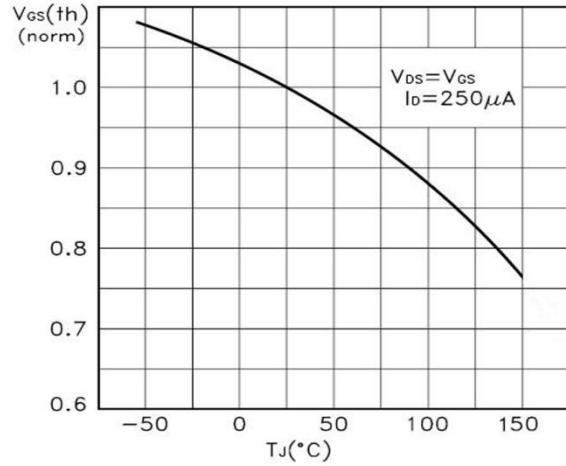


Figure9. Gate charge waveforms

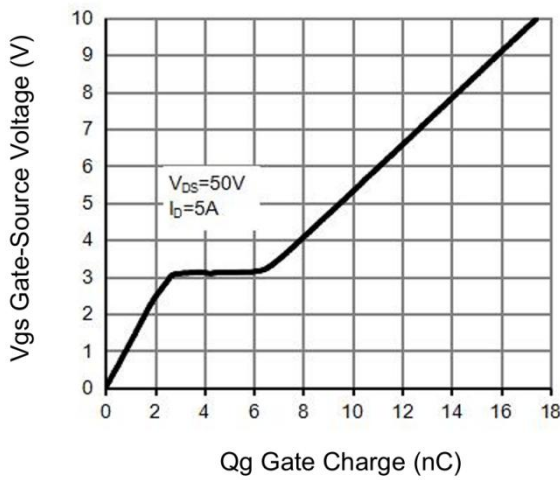


Figure10. Capacitance

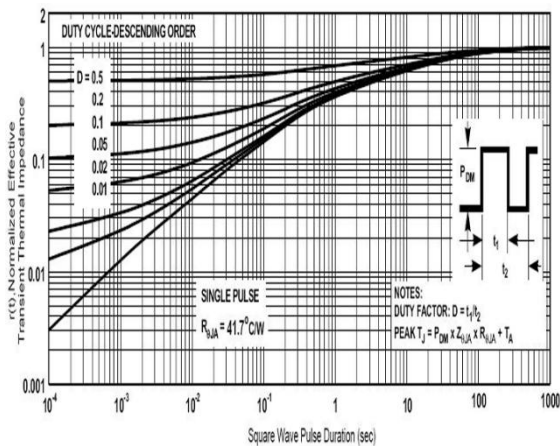
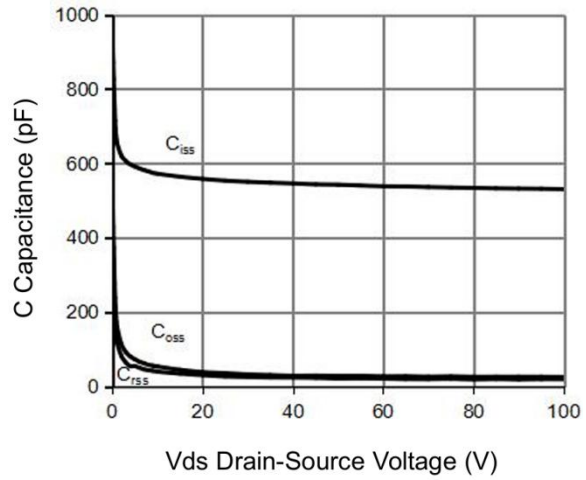


Figure11. Normalized Maximum Transient Thermal Impedance

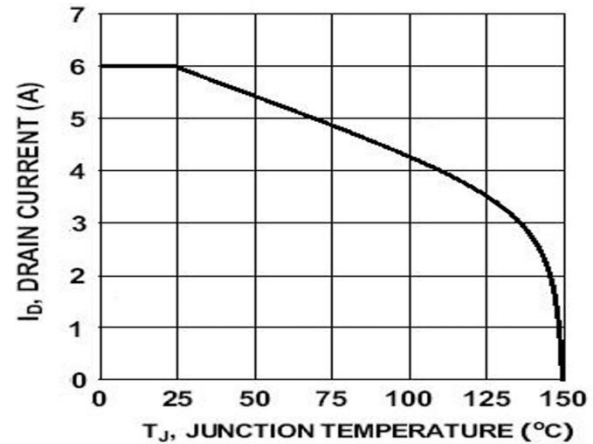
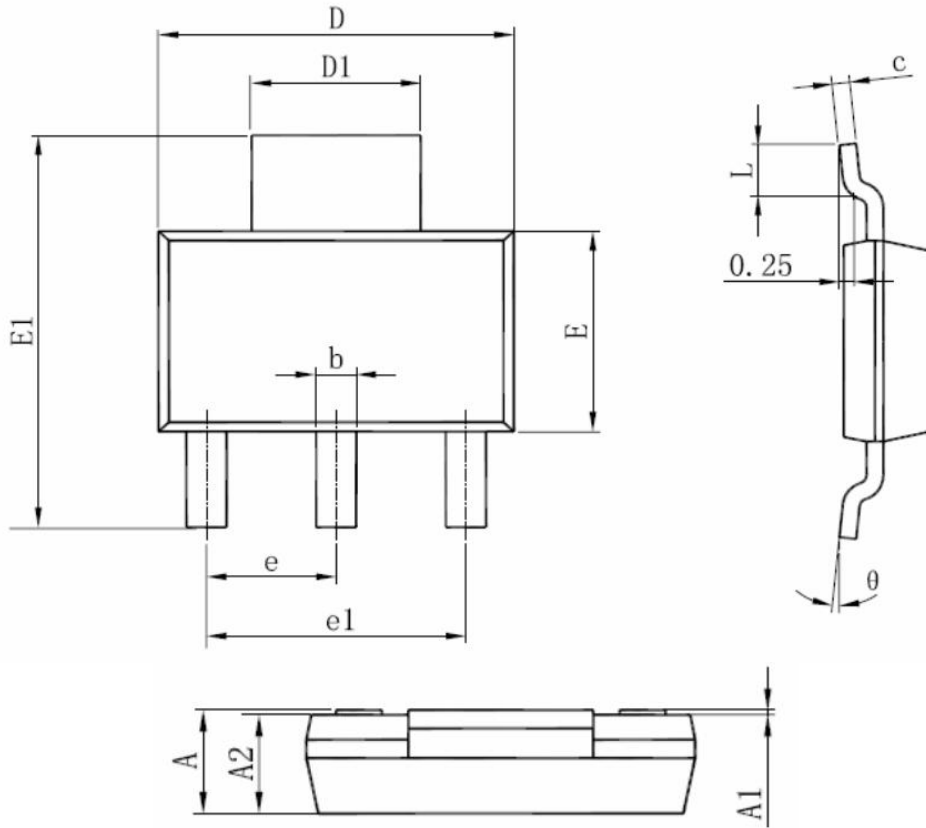


Figure12. I_D vs Junction Temperature

SOT-223 Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.520	1.800	0.060	0.071
A1	0.000	0.120	0.000	0.005
A2	1.450	1.750	0.057	0.069
b	0.600	0.820	0.024	0.032
c	0.240	0.350	0.010	0.014
D	6.200	6.500	0.244	0.256
D1	2.900	3.100	0.114	0.122
E	3.300	3.700	0.130	0.146
E1	6.700	7.300	0.264	0.287
e	2.300(BSC)		0.091(BSC)	
e1	4.500	4.700	0.177	0.185
L	0.900	1.150	0.035	0.045
θ	0°	10°	0°	10°