

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
60V	1.4Ω@10V	0.55A
	1.5Ω@4.5V	
	3.1Ω@2.5V	

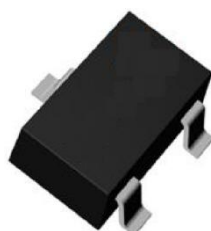
Feature

- Trench power MV MOSFET technology
- Voltage controlled small signal switch
- Low input capacitance
- Fast switching speed
- Low input / output leakage
- Suffix "-Q1" for AEC-Q101

Application

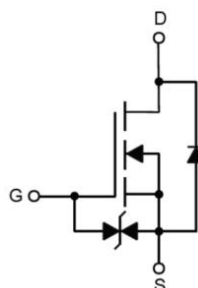
- Battery operated systems
- Solid-state relays
- Direct logic-level interface:TTL/CMOS

Package

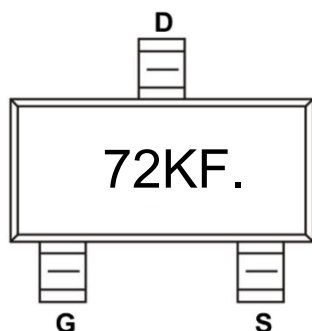


SOT-23

Circuit diagram



Marking



Absolute maximum ratings ($T_A=25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	60	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current ^{1,2)} ($V_{GS}=10\text{V}$)	I_D	0.55	A
Continuous Drain Current ^{1,2)} ($V_{GS}=10\text{V}$, $T_A=100^{\circ}\text{C}$)	$I_D (100^{\circ}\text{C})$	0.34	A
Pulsed Drain Current ($t_p \leq 10\mu\text{s}$)	I_{DM}	1.5	A
Power Dissipation ^{1,2)}	P_D	0.89	W
Thermal Resistance Junction to Ambient ²⁾	$R_{\theta JA}$	140	$^{\circ}\text{C/W}$
Operating Junction Temperature	T_J	$-55 \sim +150$	$^{\circ}\text{C}$
Storage Temperature Range	T_{STG}	$-55 \sim +150$	$^{\circ}\text{C}$

Electrical characteristics ($T_J=25^{\circ}\text{C}$ 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	60			V
Zero gate voltage drain current	I _{DSS}	V _{DS} =60V, V _{GS} =0V			1	μA
Gate-body leakage current	I _{GSS}	V _{DS} =0V, V _{GS} =±20V			±10	μA
Gate threshold voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	0.55	0.85	1.15	V
Drain-source on-resistance	R _{DS(on)}	V _{GS} =10V, I _D =0.5A		1.07	1.4	Ω
		V _{GS} =4.5V, I _D =0.2A		1.1	1.5	
		V _{GS} =2.5V, I _D =0.1A		1.3	3.1	
Dynamic characteristics ³⁾						
Input Capacitance	C _{iss}	V _{DS} =30V, V _{GS} =0V, f =1MHz		24.3		pF
Output Capacitance	C _{oss}			5.8		
Reverse Transfer Capacitance	C _{rss}			3		
Total Gate Charge	Q _g	V _{DS} =30V, V _{GS} =10V, I _D =0.3A		1.08		nC
Gate-Source Charge	Q _{gs}			0.08		
Gate-Drain Charge	Q _{gd}			0.15		
Turn-on delay time	t _{d(on)}	V _{DS} =30V, V _{GS} =10V, I _D =0.3A R _G =3Ω		2.9		nS
Turn-on rise time	t _r			2.9		
Turn-off delay time	t _{d(off)}			15.8		
Turn-off fall time	t _f			44.2		
Source-Drain Diode characteristics						
Maximum Body-Diode Continuous Current	I _S				0.55	A
Diode Forward voltage	V _{SD}	V _{GS} =0V, I _S =0.5A			1.2	V
Reverse recovery time	T _{rr}	V _{GS} =0V, V _R =30V, I _F =0.3A		34.6		nS
Reverse recovery charge	Q _{rr}	di/dt =100 A/μs		10		nC

Notes:

- 1) The entire application environment impacts the thermal resistance values shown, they are not constants and are only valid for the particular conditions noted.
- 2) The value of $R_{\theta JA}$ is measured with the device mounted on the 40mm*40mm*1.1mm single layer FR-4 PCB board with 1 in² pad of 2oz. Copper, in the still air environment with $T_A=25^{\circ}\text{C}$.
The maximum allowed junction temperature of 150°C . The value in any given application depends on the user's specific board design.
- 3) Guaranteed by design, not subject to production testing.

Typical Characteristics

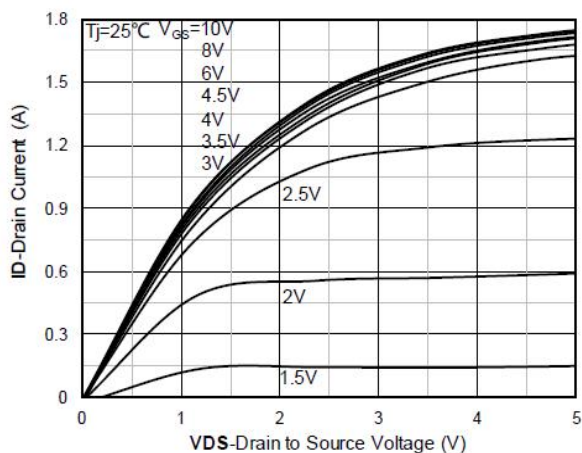


Figure 1. Output Characteristics; typical values

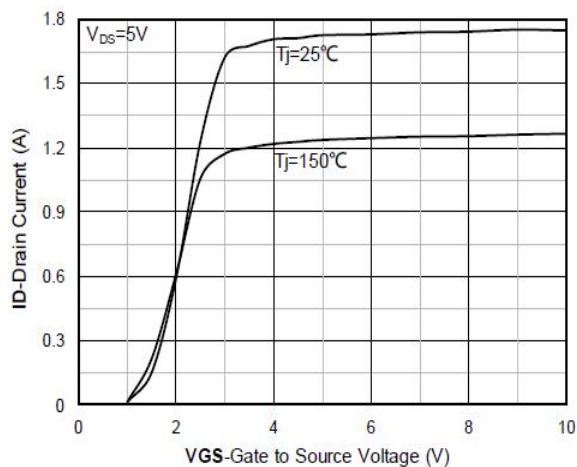


Figure 2. Transfer Characteristics; typical values

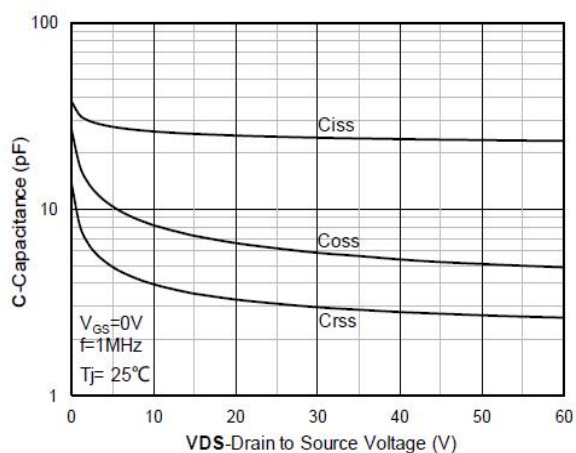


Figure 3. Capacitance Characteristics; typical values

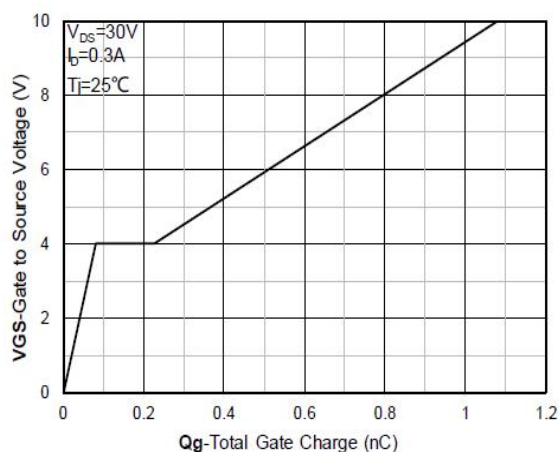


Figure 4. Gate Charge; typical values

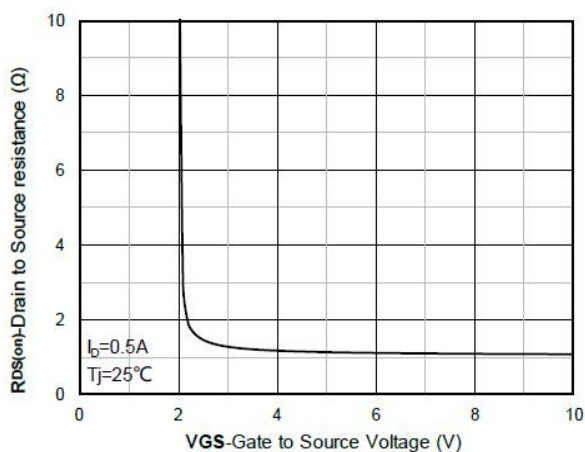


Figure 5. On-Resistance vs Gate to Source Voltage; typical values

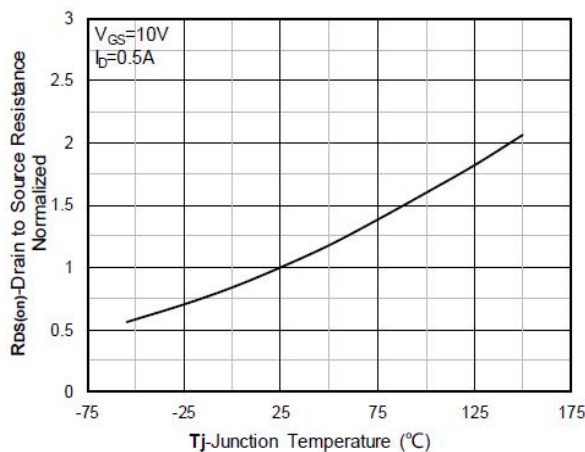


Figure 6. Normalized On-Resistance

Typical Characteristics

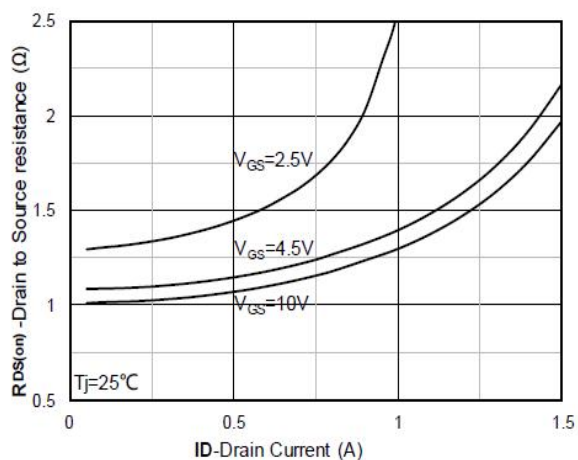


Figure 7. $R_{DS(on)}$ VS Drain Current; typical values

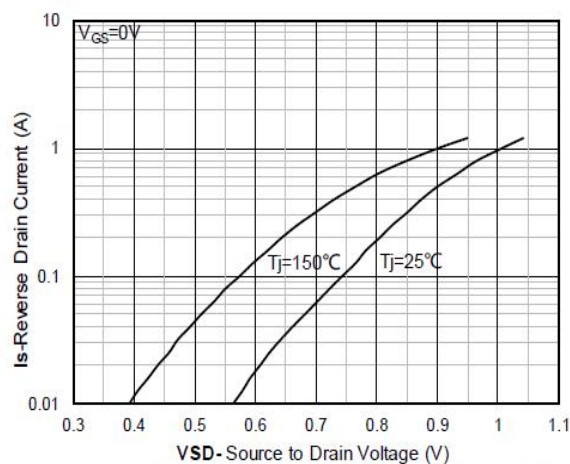


Figure 8. Forward characteristics of reverse diode; typical values

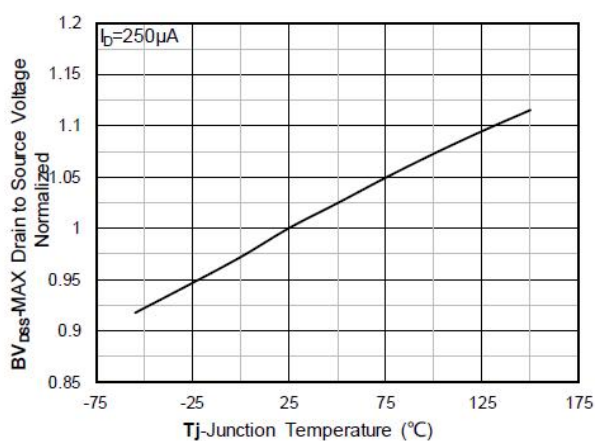


Figure 9. Normalized breakdown voltage

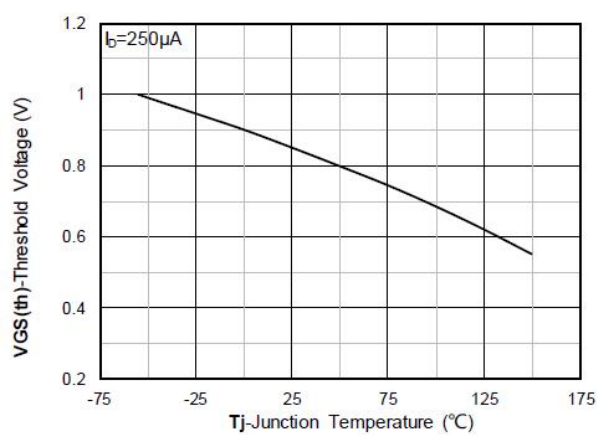


Figure 10. Gate Threshold voltage; typical values

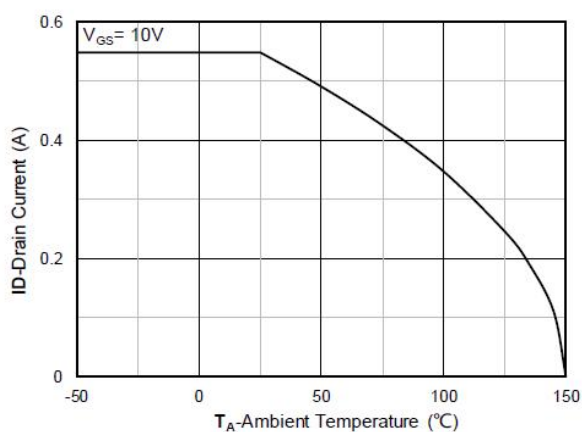


Figure 11. Current dissipation

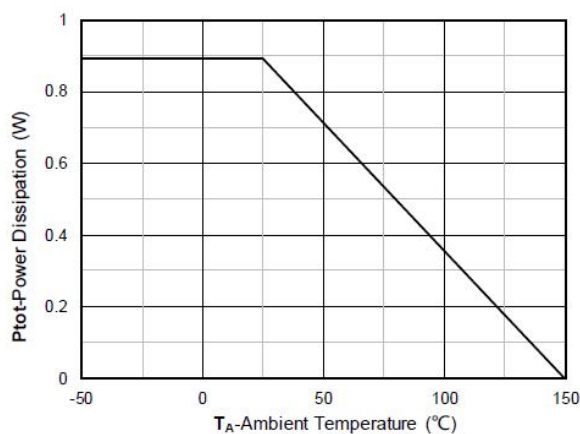


Figure 12. Power dissipation

Typical Characteristics

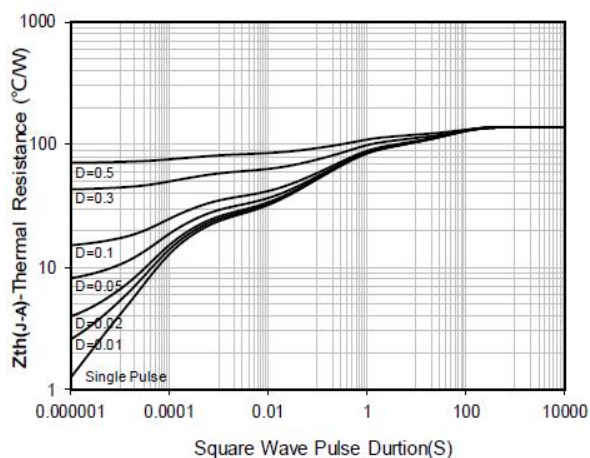


Figure 13. Maximum Transient Thermal Impedance

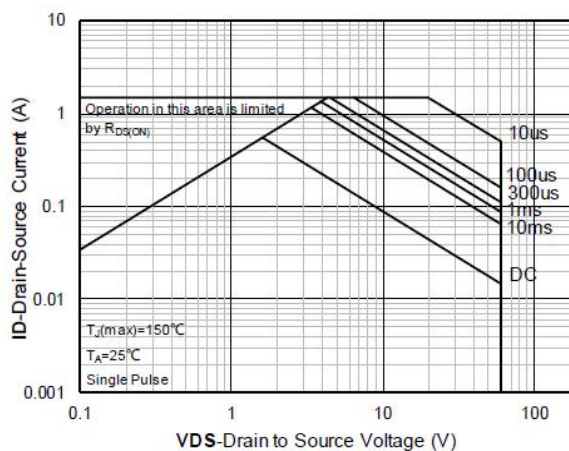
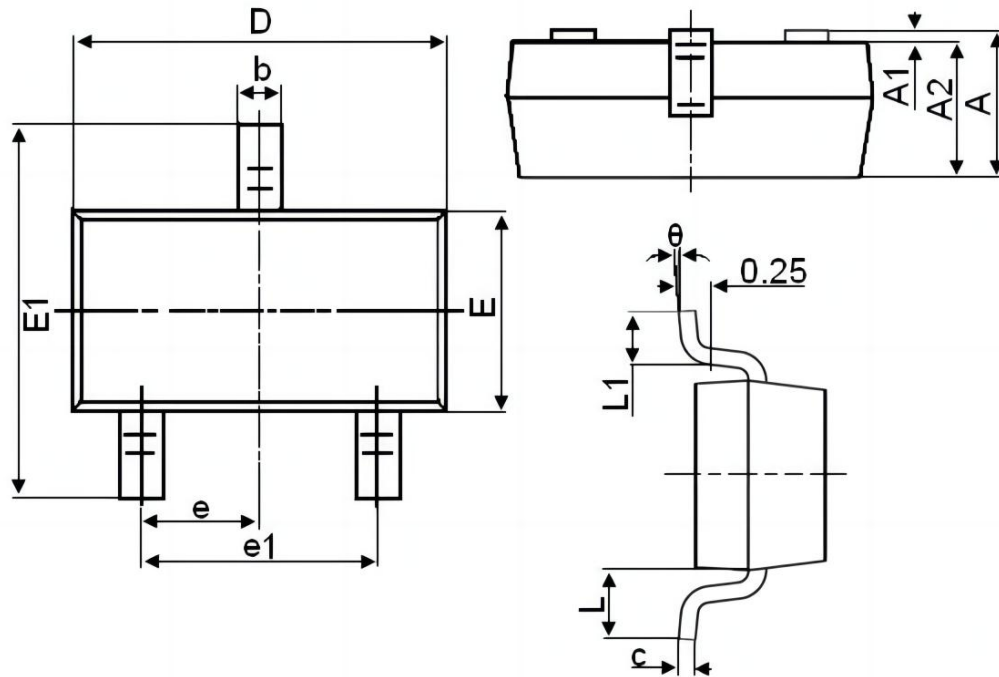


Figure 14. Safe Operation Area

SOT-23 Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
C	0.100	0.200	0.004	0.008
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP.		0.037 TYP.	
e1	1.800	2.000	0.071	0.079
L	0.550 REF.		0.022 REF.	
L1	0.300	0.500	0.012	0.020
θ	0°	8°	0°	8°