

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
100V	130mΩ@10V	3A
	165mΩ@4.5V	

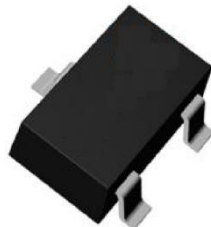
Feature

- Advanced SGT technology
- Low $R_{DS(on)} \times Q_G$ FOM
- Extremely low switching loss
- Excellent stability and uniformity
- Suffix "-Q1" for AEC-Q101

Application

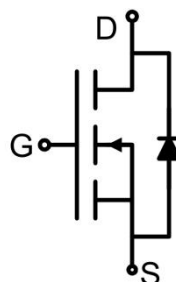
- PWM applications
- Power management
- Load switch

Package

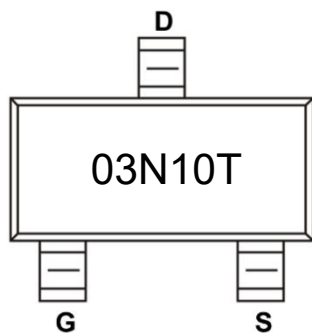


SOT-23-3L

Circuit diagram



Marking



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

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	100	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current ($T_C=25^{\circ}\text{C}$)	I_D	3	A
Continuous Drain Current ¹⁾ ($t_p \leq 1\text{s}$)	I_D	2.2	A
Pulsed Drain Current ($t_p=10\mu\text{s}$)	I_{DM}	20	A
Single Pulse Avalanche Energy ³⁾	E_{AS}	0.1	mJ
Power Dissipation ¹⁾ ($t_p \leq 1\text{s}$)	P_D	1.4	W
Power Dissipation ¹⁾ (Steady state)	P_D	0.83	W
Thermal Resistance from Junction to Ambient ¹⁾ ($t_p \leq 1\text{s}$)	$R_{\theta JA}$	90	$^{\circ}\text{C}/\text{W}$
Thermal Resistance from Junction to Ambient ¹⁾ (Steady state)	$R_{\theta JA}$	150	$^{\circ}\text{C}/\text{W}$
Operating Junction Temperature	T_J	$-55 \sim +150$	$^{\circ}\text{C}$
Storage Temperature	T_{STG}	$-55 \sim +150$	$^{\circ}\text{C}$

Electrical characteristics ($T_C=25^{\circ}\text{C}$, unless otherwise noted)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu A$	100			V
Zero gate voltage drain current	I_{DSS}	$V_{DS}=80V, V_{GS}=0V$			1	μA
Gate-body leakage current	I_{GSS}	$V_{DS}=0V, V_{GS}=\pm 20V$			± 100	nA
Gate threshold voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1	1.5	2.5	V
Drain-source on-resistance ²⁾	$R_{DS(on)}$	$V_{GS}=10V, I_D=3A$		105	130	m Ω
		$V_{GS}=4.5V, I_D=2A$		135	165	
Dynamic characteristics ⁴⁾						
Input Capacitance	C_{iss}	$V_{DS}=50V, V_{GS}=0V, f=1MHz$		143		pF
Output Capacitance	C_{oss}			50		
Reverse Transfer Capacitance	C_{rss}			2.8		
Gate Charge	Q_g	$V_{DS}=50V, V_{GS}=10V, I_D=3A$		6		nC
Gate-Source Charge	Q_{gs}			1.4		
Gate-Drain Charge	Q_{gd}			0.8		
Turn-on delay time	$t_{d(on)}$	$V_{DS}=50V, V_{GS}=10V, I_D=3A$ $R_G=2\Omega$		13.2		nS
Turn-on rise time	t_r			2.2		
Turn-off delay time	$t_{d(off)}$			11		
Turn-off fall time	t_f			1.1		
Source-Drain Diode characteristics						
Diode Forward current	I_S				3	A
Diode Forward voltage ²⁾	V_{SD}	$V_{GS}=0V, I_S=3A$			1	V
Reverse Recovery Time	T_{rr}	$V_{GS}=0V, I_F=3A$		30		nS
Reverse Recovery Charge	Q_{rr}	$di/dt=100A/\mu s$		24		nC

Notes:

- 1) The data tested by surface mounted on a 1 inch² FR-4 board with 20Z copper.
- 2) The data tested by pulsed, pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 2\%$.
- 3) The E_{AS} data shows Max. rating. The test condition is $V_{DD}=50\text{V}, V_{GS}=10\text{V}, L=0.1\text{mH}$.
- 4) Guaranteed by design, not subject to production testing.

Typical Characteristics

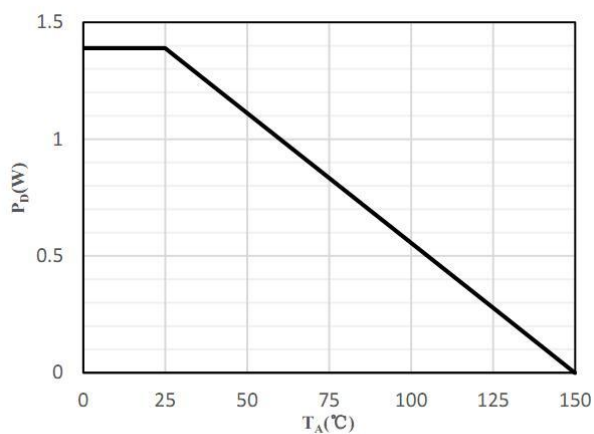


Fig 1 Power Dissipation

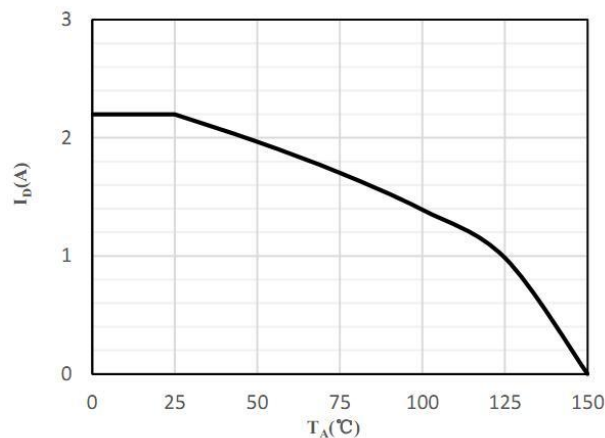


Fig 2 Drain Current

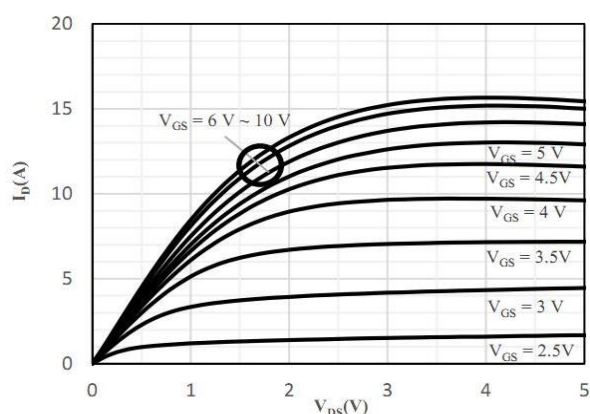


Fig 3 Typical Output Characteristics

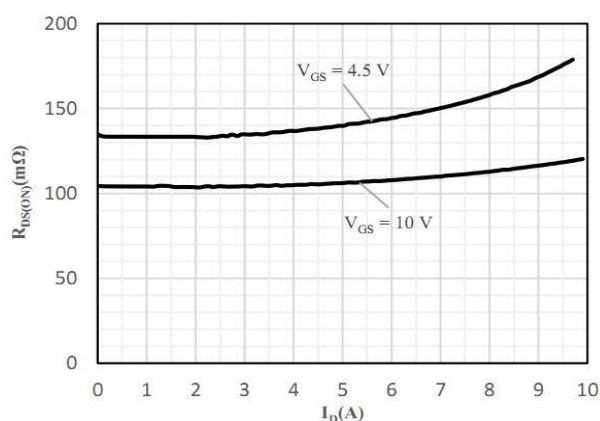


Fig 4 On-Resistance vs. Drain Current

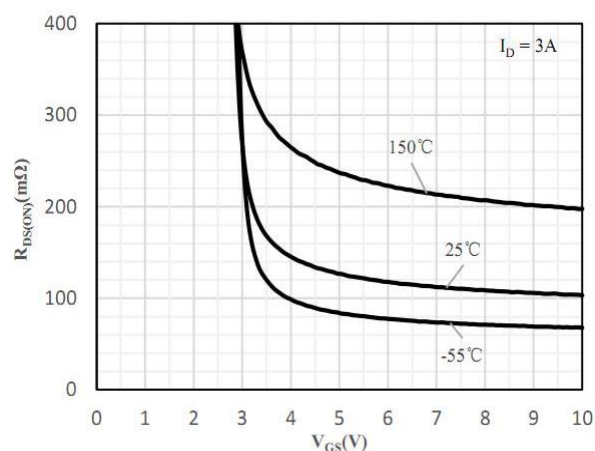


Fig 5 On-Resistance vs. Gate-Source Voltage

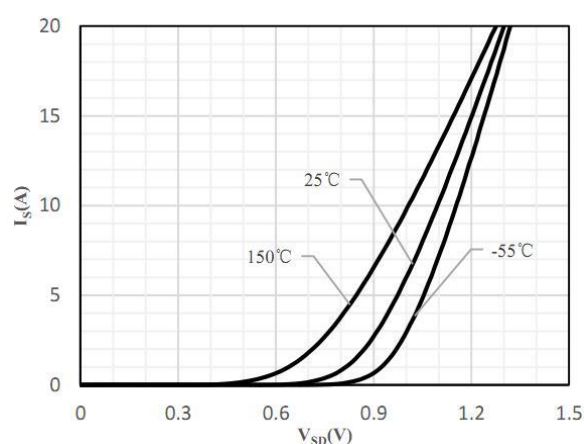


Fig 6 Body-Diode Characteristics

Typical Characteristics

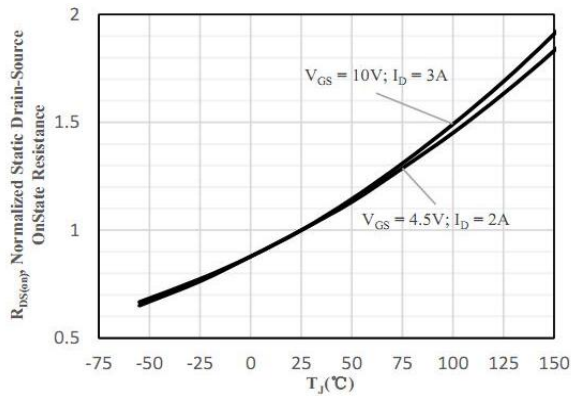


Fig 7 Normalized On-Resistance vs. Junction Temperature

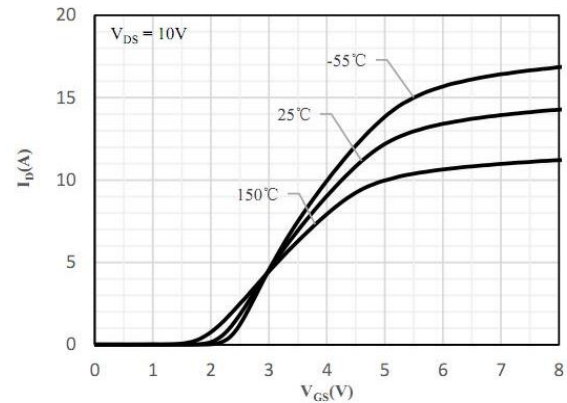


Fig 8 Transfer Characteristics

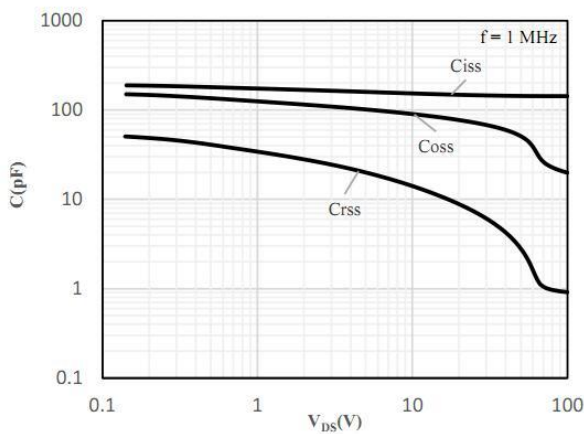


Fig 9 Capacitance Characteristics

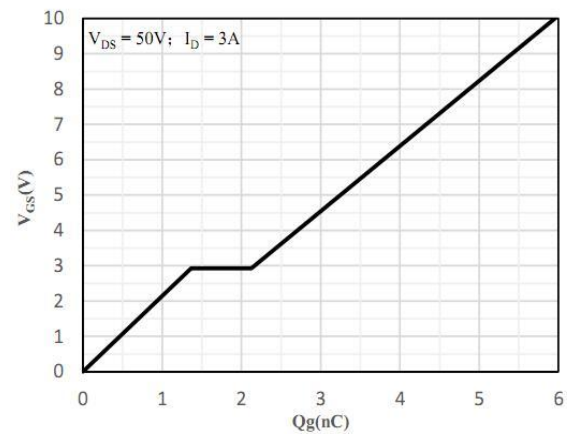


Fig 10 Gate-Charge Characteristics

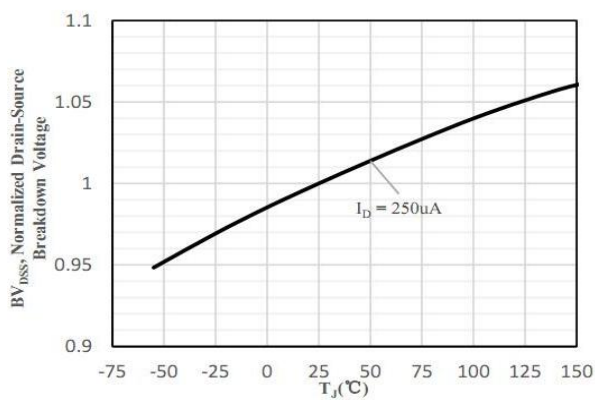


Fig 11 Normalized Breakdown Voltage vs. Junction Temperature

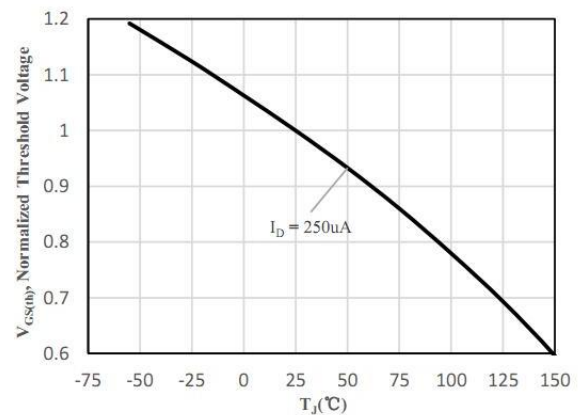


Fig 12 Normalized $V_{GS(th)}$ vs. Junction Temperature

Typical Characteristics

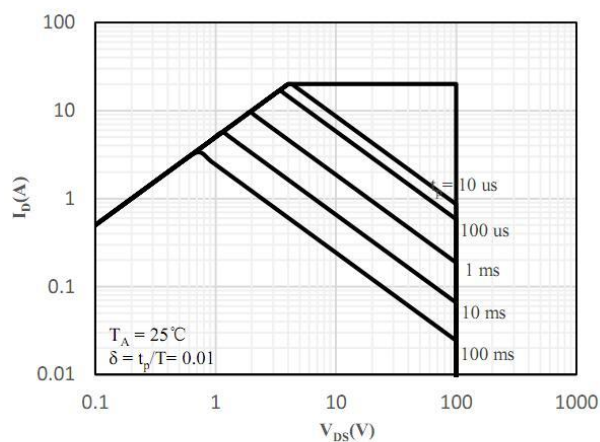


Fig 13 Safe Operating Area

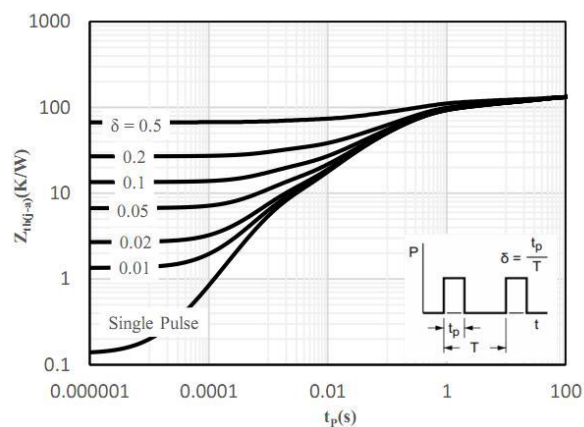
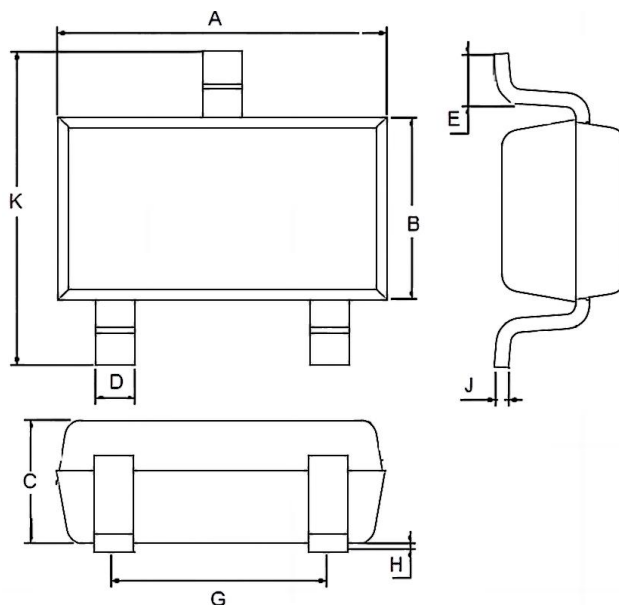


Fig 14 Maximum transient thermal impedance

SOT-23-3L Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.800	3.000	0.110	0.118
B	1.500	1.700	0.059	0.067
C	1.000	1.200	0.039	0.047
D	0.350	0.450	0.014	0.018
E	0.350	0.550	0.014	0.022
G	1.800	2.000	0.071	0.079
H	0.020	0.100	0.001	0.004
J	0.100	0.200	0.004	0.008
K	2.600	3.000	0.102	0.118