

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
-40V	85mΩ@-10V	-5.3A

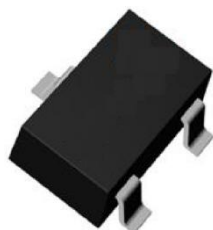
Feature

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

Application

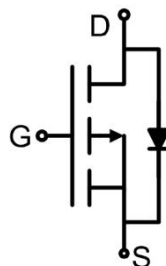
- DC-DC converter
- Power switching application
- Hard switched and high frequency circuits

Package

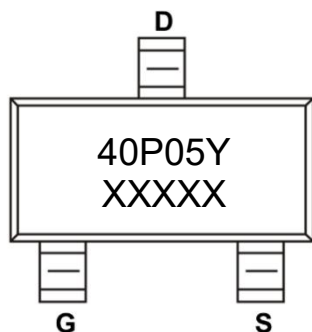


SOT-23-3L

Circuit diagram



Marking



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

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	-40	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current	I_D	-5.3	A
Continuous Drain Current ($T_C=100^{\circ}\text{C}$)	$I_D(100^{\circ}\text{C})$	-3.7	A
Pulsed Drain Current ¹⁾	I_{DM}	-18	A
Power Dissipation	P_D	2	W
Thermal Resistance from Junction to Ambient ²⁾	$R_{\theta JA}$	62.5	$^{\circ}\text{C}/\text{W}$
Junction Temperature	T_J	150	$^{\circ}\text{C}$
Storage Temperature	T_{STG}	-55 ~ +150	$^{\circ}\text{C}$

Electrical characteristics ($T_A=25^{\circ}\text{C}$, 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	-40			V
Zero gate voltage drain current	I _{DSS}	V _{DS} =-40V,V _{GS} =0V			-1	μA
Gate-body leakage current	I _{GSS}	V _{GS} =±20V, V _{DS} =0V			±100	nA
Gate threshold voltage ³⁾	V _{GS(th)}	V _{DS} =V _{GS} , I _D =-250μA	-1.0	-1.9	-3.0	V
Drain-source on-resistance ³⁾	R _{DS(on)}	V _{GS} =-10V, I _D =-5A		73	85	mΩ
Dynamic characteristics ⁴⁾						
Input Capacitance	C _{iss}	V _{DS} =-20V,V _{GS} =0V,f =1MHz		600		pF
Output Capacitance	C _{oss}			90		
Reverse Transfer Capacitance	C _{rss}			70		
Total Gate Charge	Q _g	V _{DS} =-20V,V _{GS} =-10V, I _D =-3A		14		nC
Gate-Source Charge	Q _{gs}			2.9		
Gate-Drain Charge	Q _{gd}			3.8		
Turn-on delay time	t _{d(on)}	V _{DD} =-20V, V _{GS} =-10V, R _L =2Ω, R _{GEN} =3Ω		9		nS
Turn-on rise time	t _r			8		
Turn-off delay time	t _{d(off)}			28		
Turn-off fall time	t _f			10		
Source-Drain Diode characteristics						
Diode Forward Current ³⁾	I _S				-5.3	A
Diode Forward voltage ²⁾	V _{SD}	V _{GS} =0V, I _S =-3.3A			-1.2	V

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

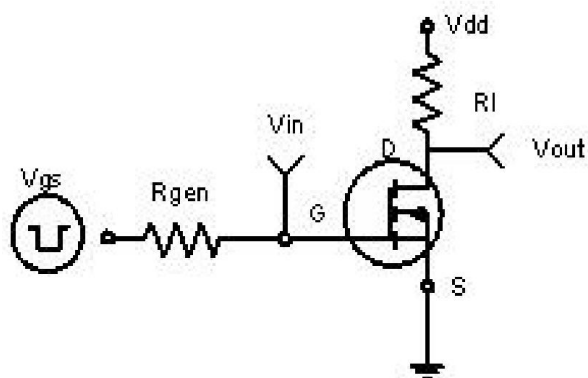


Figure 1: Switching Test Circuit

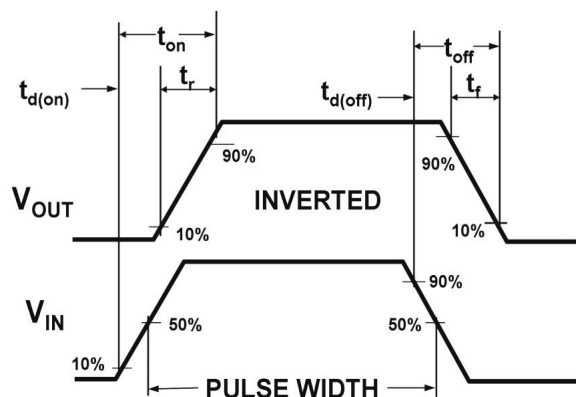


Figure 2: Switching Waveforms

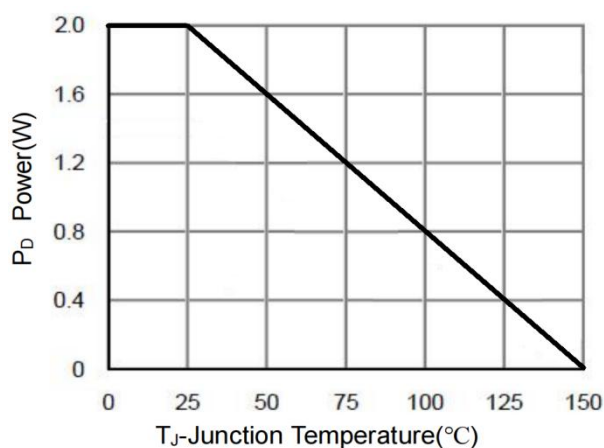


Figure 3 Power Dissipation

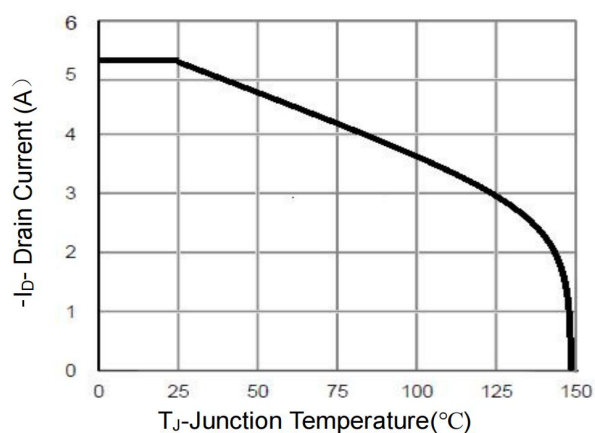


Figure 4 Drain Current

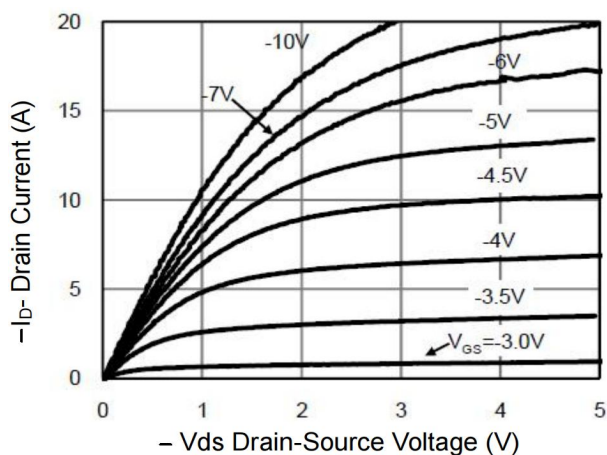


Figure 5 Output Characteristics

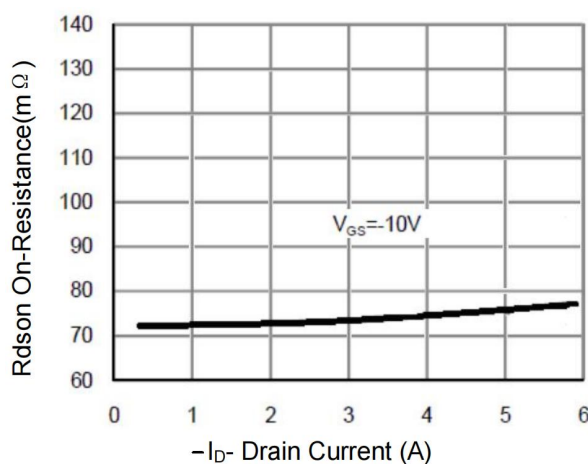


Figure 6 Drain-Source On-Resistance

Typical Characteristics

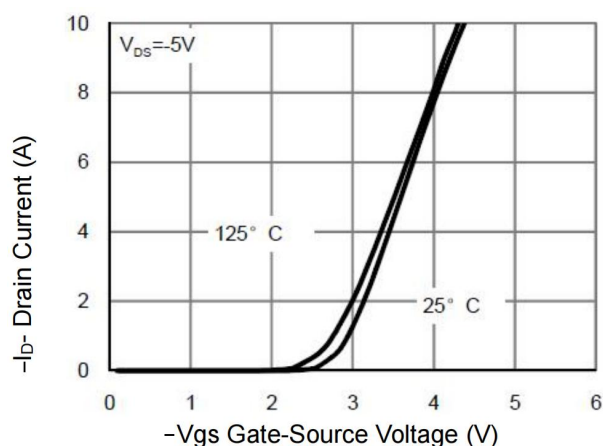


Figure 7 Transfer Characteristics

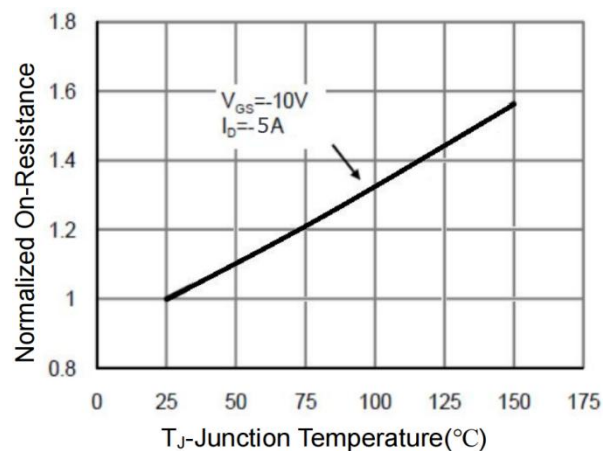


Figure 8 Drain-Source On-Resistance

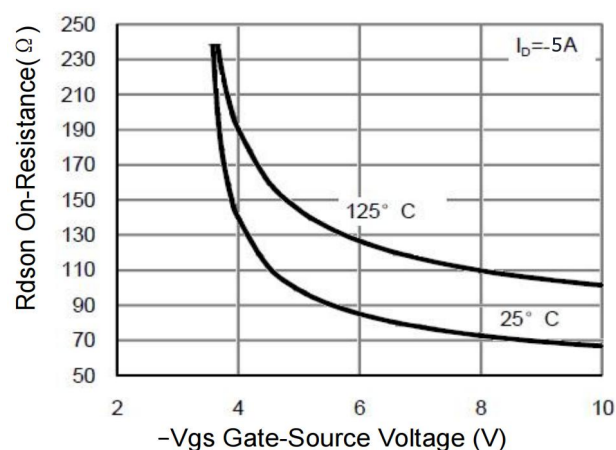


Figure 9 Rdson vs Vgs

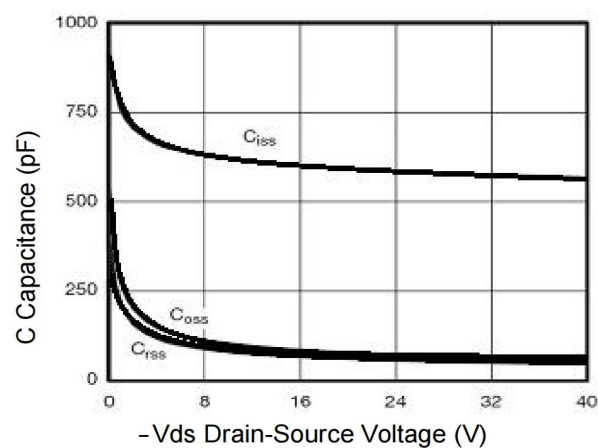


Figure 10 Capacitance vs Vds

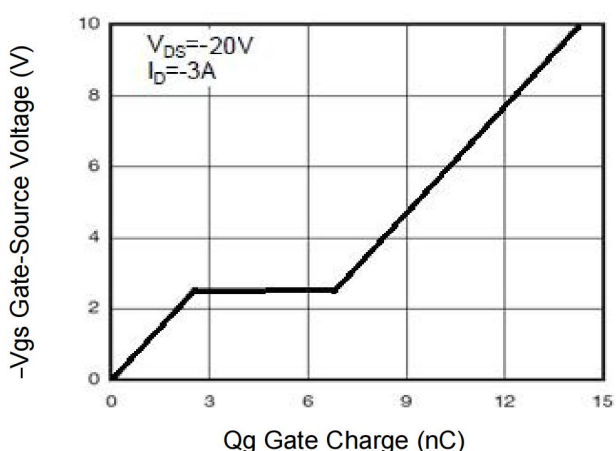


Figure 11 Gate Charge

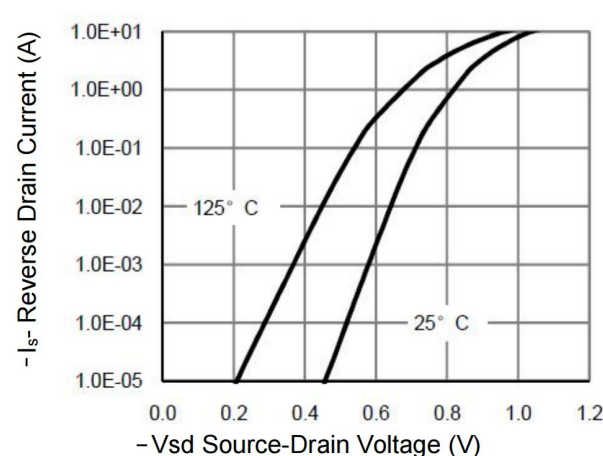


Figure 12 Source- Drain Diode Forward

Typical Characteristics

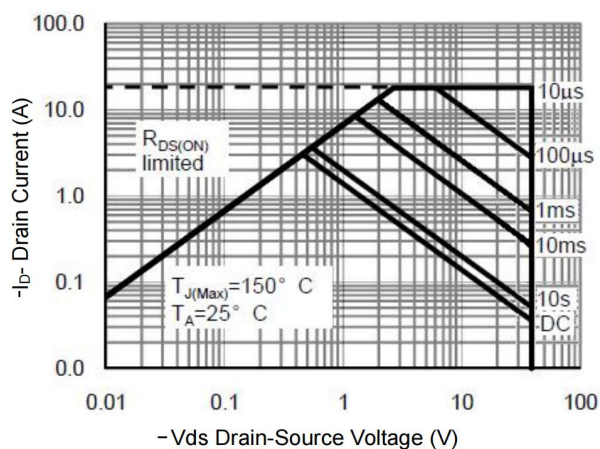


Figure 13 Safe Operation Area

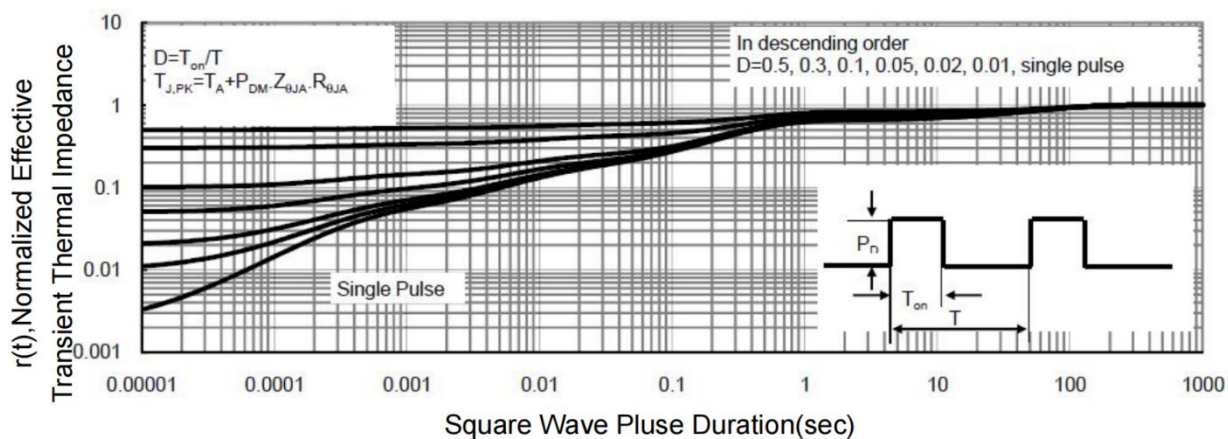
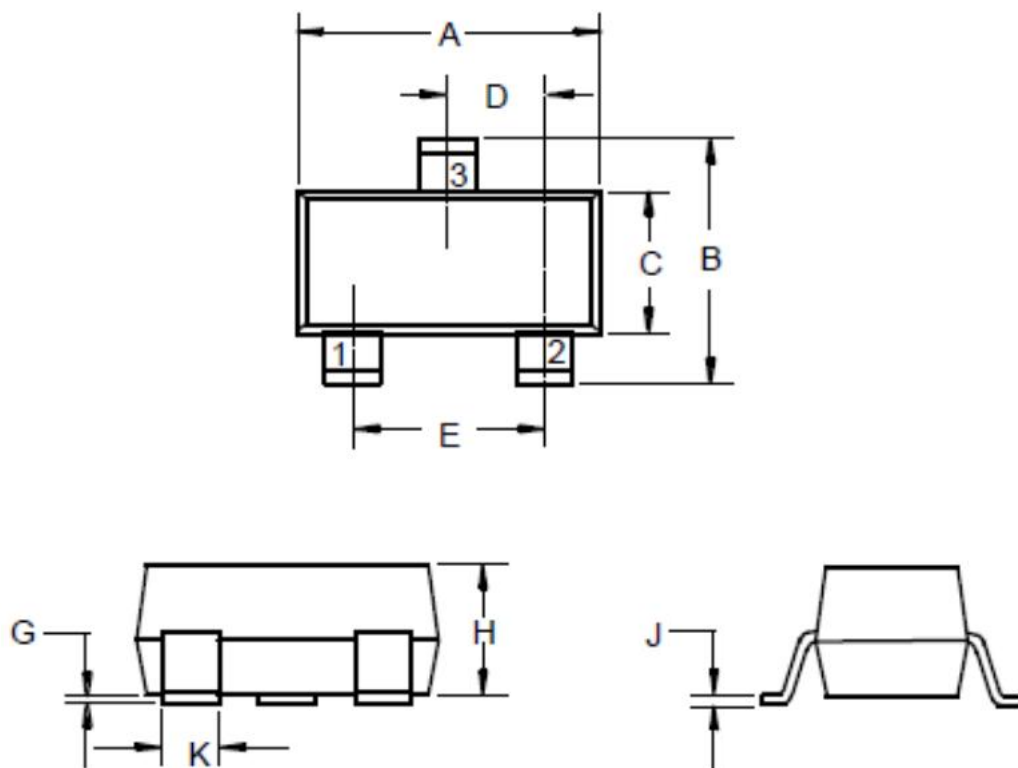


Figure 14 Normalized Maximum Transient Thermal Impedance

SOT-23-3L Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.820	3.020	0.111	0.119
B	2.650	2.950	0.104	0.116
C	1.500	1.700	0.059	0.067
D	0.865	1.015	0.034	0.040
E	1.800	2.000	0.071	0.079
G	0.000	0.100	0.000	0.004
H	1.050	1.250	0.041	0.049
J	0.100	0.200	0.004	0.008
K	0.300	0.500	0.012	0.020