

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
-40V	85mΩ@-10V	-5.3A
	125mΩ@-4.5V	

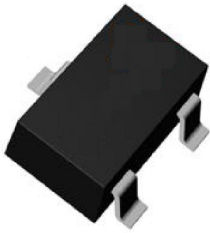
Feature

- 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

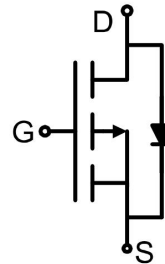
- DC-DC converter
- Power switching application
- Hard switched and high frequency circuits

Package

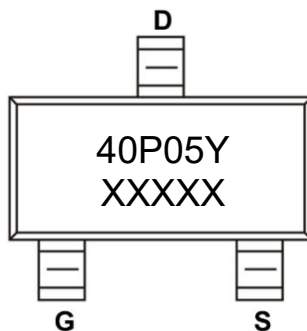


SOT-23-3L

Circuit diagram



Marking



Absolute maximum ratings (Ta=25°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 (100°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	$R_{\theta JA}$	62.5	°C/W
Junction Temperature	T_J	150	°C
Storage Temperature	T_{STG}	-55 ~ +150	°C

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

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = -250\mu A$	-40			V
Zero gate voltage drain current	I_{DSS}	$V_{DS} = -40V, V_{GS} = 0V$			-1	μA
Gate-body leakage current	I_{GSS}	$V_{GS} = \pm 20V, V_{DS} = 0V$			± 100	nA
Gate threshold voltage ³⁾	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\mu A$	-1.0	-1.9	-3.0	V
Drain-source on-resistance ³⁾	$R_{DS(on)}$	$V_{GS} = -10V, I_D = -5.0A$		73	85	m Ω
		$V_{GS} = -4.5V, I_D = -4.0A$		98	125	
Forward transconductance	g_{FS}	$V_{DS} = -5V, I_D = -3A$		5		S
Dynamic characteristics⁴⁾						
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	$V_{DS} = -20V, V_{GS} = -10V, I_D = -3.0A$		14		nC
Gate-Source Charge	Q_{gs}			2.9		
Gate-Drain Charge	Q_{gd}			3.8		
Turn-on delay time	$t_{d(on)}$	$V_{DD} = -20V, V_{GS} = -10V, R_L = 2.0\Omega, R_{GEN} = 3.0\Omega$		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_{DS}	$V_{GS} = 0V, I_S = -3.3A$			-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 $\leq 300\mu s$, Duty Cycle $\leq 2\%$.
- 4) Guaranteed by design, not subject to production

Typical Characteristics

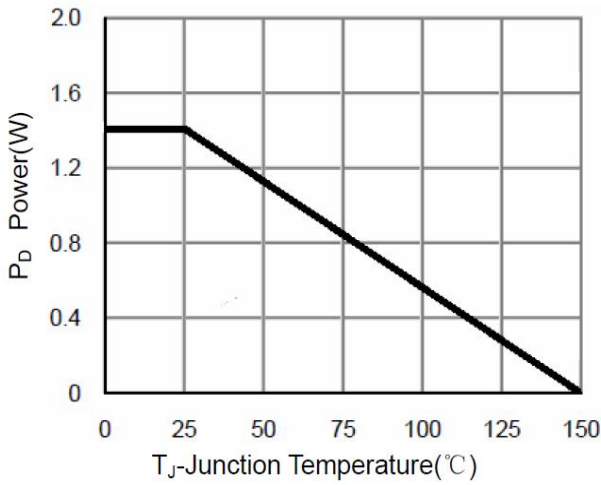


Figure 1 Power Dissipation

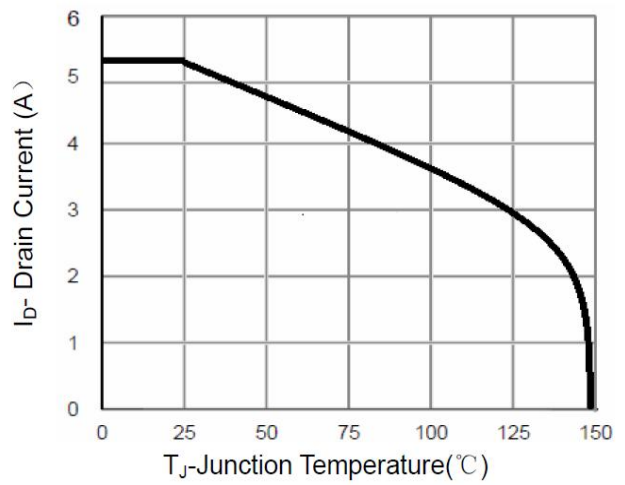


Figure 2 Drain Current

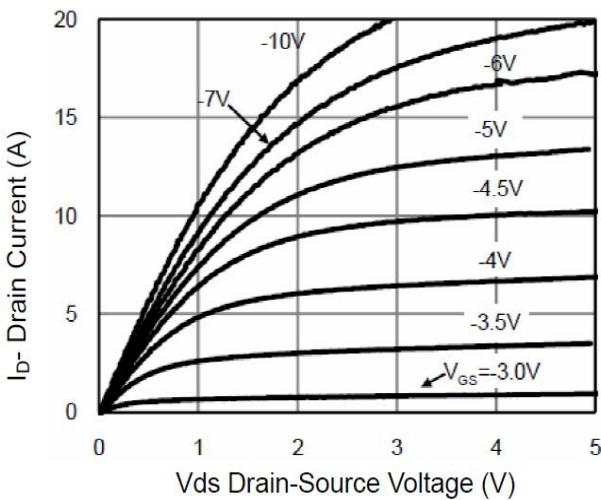


Figure 3 Output Characteristics

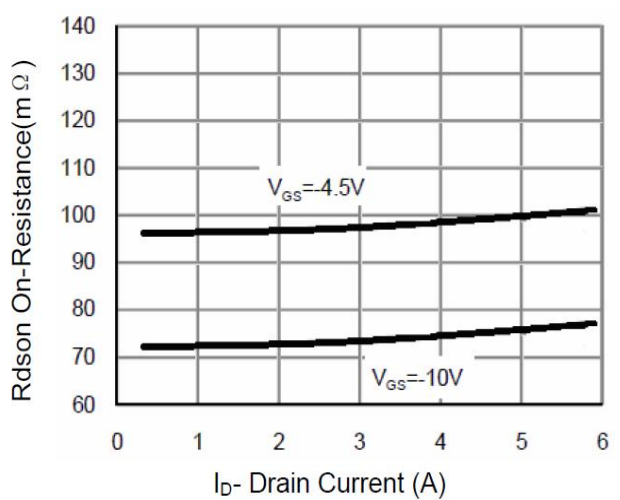


Figure 4 Drain-Source On-Resistance

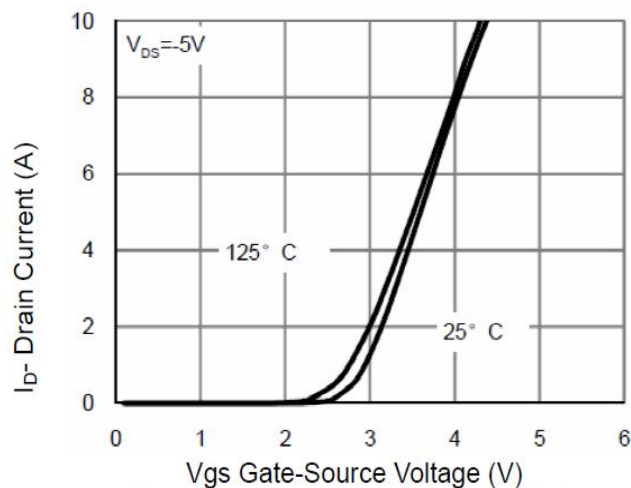


Figure 5 Transfer Characteristics

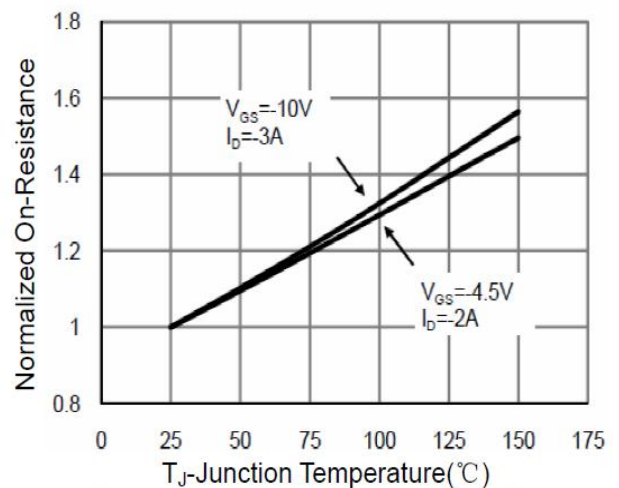


Figure 6 Drain-Source On-Resistance

Typical Characteristics

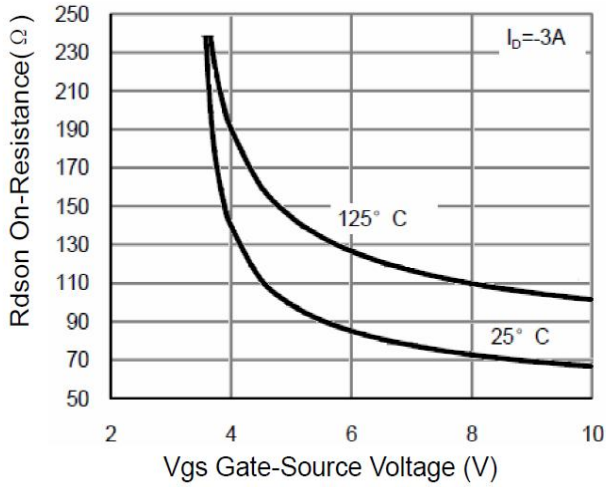


Figure 7 Rdson vs Vgs

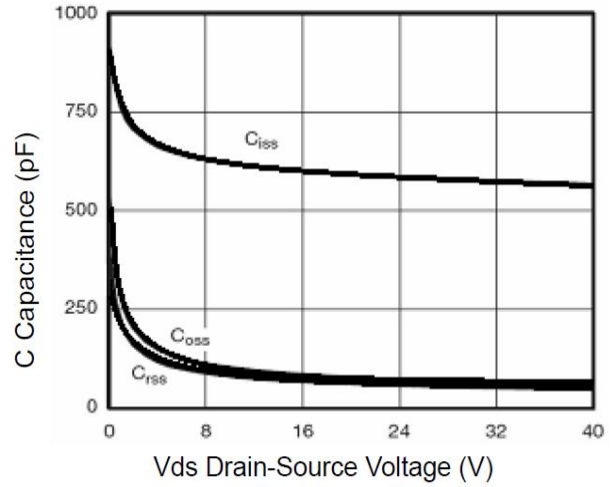


Figure 8 Capacitance vs Vds

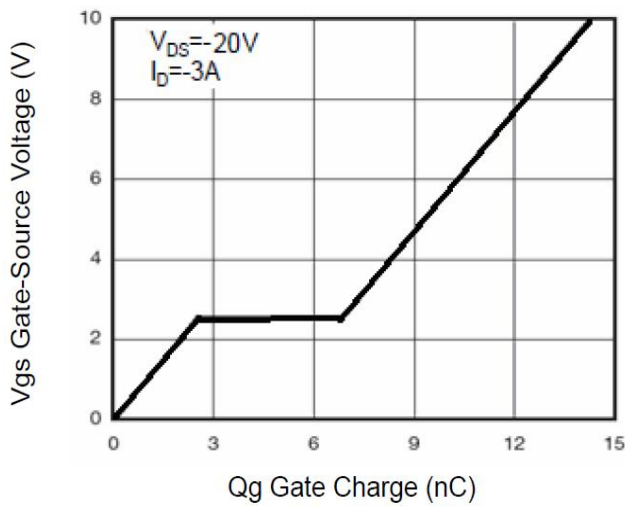


Figure 9 Gate Charge

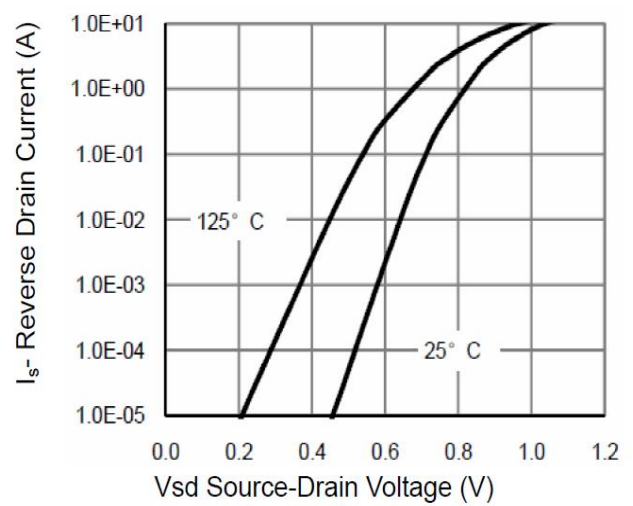


Figure 10 Source-Drain Diode Forward

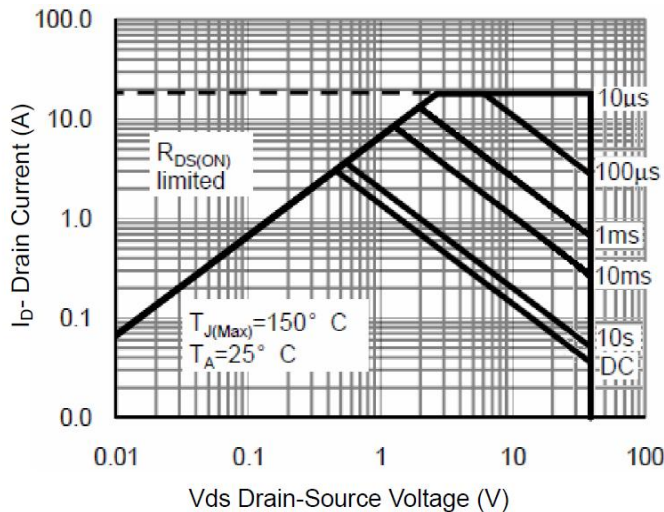


Figure 11 Safe Operation Area

Typical Characteristics

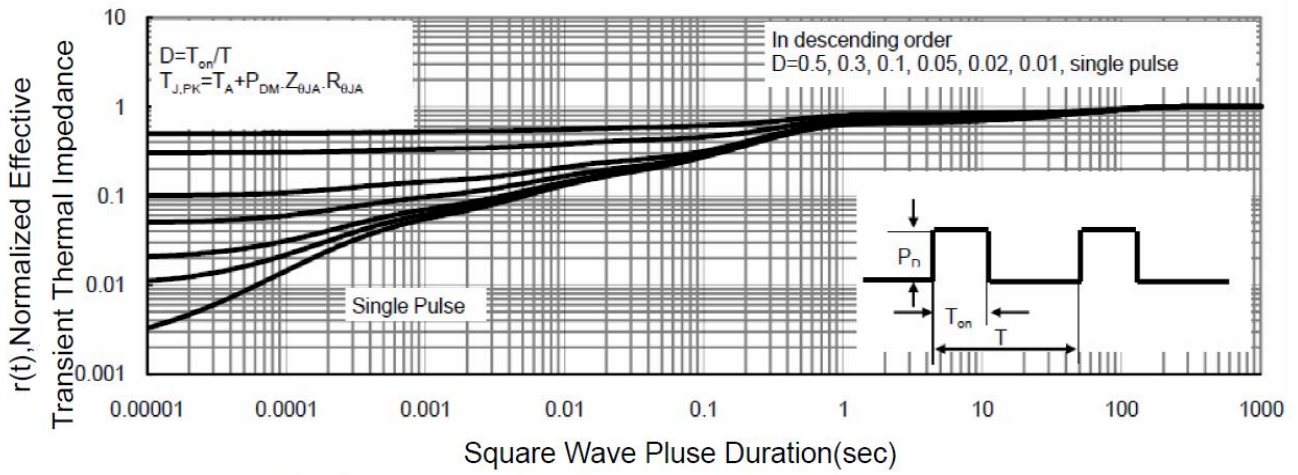
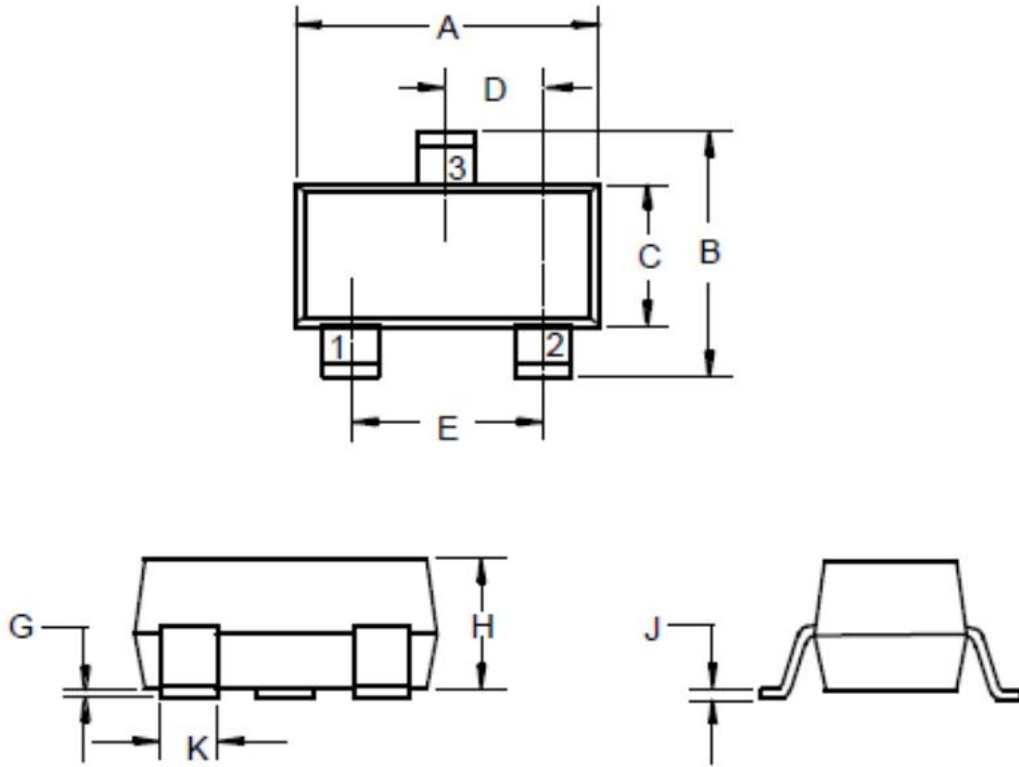


Figure 12 Normalized Maximum Transient Thermal Impedance

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