

## Product Summary

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

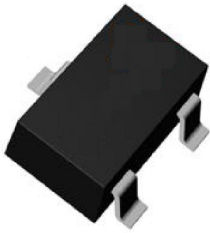
## Feature

- High density cell design for low Rdson
- Fully characterized avalanche voltage and current
- Excellent package for good heat dissipation

## Application

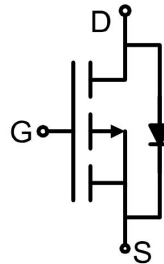
- DC-DC converter
- Power switching application
- Hard switched and high frequency circuits

## Package

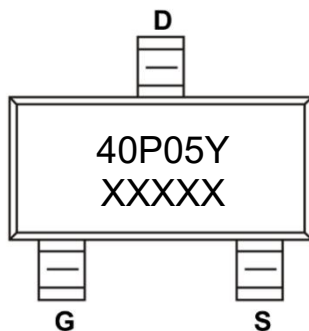


SOT-23-3L

## Circuit diagram



## Marking



### Absolute maximum ratings (Ta=25°C unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V <sub>DS</sub>	-40	V
Gate-Source Voltage	V <sub>GS</sub>	±20	V
Continuous Drain Current	I <sub>D</sub>	-5.3	A
Continuous Drain Current (100°C)	I <sub>D</sub> (100°C)	-3.7	A
Pulsed Drain Current <sup>1)</sup>	I <sub>DM</sub>	-18	A
Power Dissipation	P <sub>D</sub>	2	W
Thermal Resistance from Junction to Ambient	R <sub>θJA</sub>	62.5	°C/W
Junction Temperature	T <sub>J</sub>	150	°C
Storage Temperature	T <sub>STG</sub>	-55 ~ +150	°C

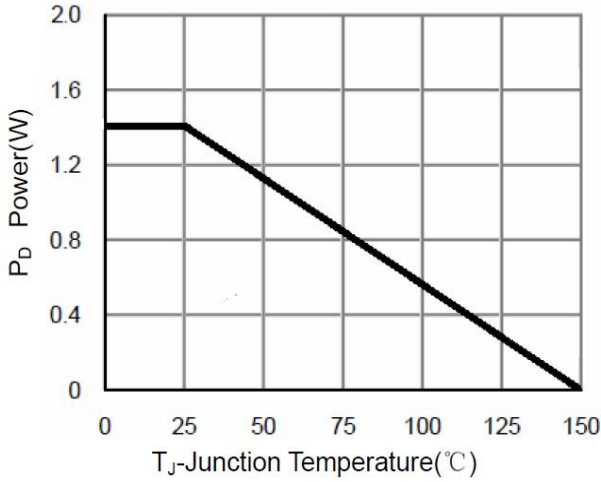
### Electrical characteristics (T<sub>A</sub>=25 °C, unless otherwise noted)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
<b>Static Characteristics</b>						
Drain-source breakdown voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> = 0V, I <sub>D</sub> = -250μA	-40			V
Zero gate voltage drain current	I <sub>DSS</sub>	V <sub>DS</sub> = -40V, V <sub>GS</sub> = 0V			-1	μA
Gate-body leakage current	I <sub>GSS</sub>	V <sub>GS</sub> = ±20V, V <sub>DS</sub> = 0V			±100	nA
Gate threshold voltage <sup>3)</sup>	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = -250μA	-1.0	-1.9	-3.0	V
Drain-source on-resistance <sup>3)</sup>	R <sub>DS(on)</sub>	V <sub>GS</sub> = -10V, I <sub>D</sub> = -5.0A		73	85	mΩ
		V <sub>GS</sub> = -4.5V, I <sub>D</sub> = -4.0A		98	125	
Forward transconductance	g <sub>FS</sub>	V <sub>DS</sub> = -5V, I <sub>D</sub> = -3A		5		S
<b>Dynamic characteristics<sup>4)</sup></b>						
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> = -20V, V <sub>GS</sub> = 0V, f = 1MHz		600		pF
Output Capacitance	C <sub>oss</sub>			90		
Reverse Transfer Capacitance	C <sub>rss</sub>			70		
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> = -20V, V <sub>GS</sub> = -10V, I <sub>D</sub> = -3.0A		14		nC
Gate-Source Charge	Q <sub>gs</sub>			2.9		
Gate-Drain Charge	Q <sub>gd</sub>			3.8		
Turn-on delay time	t <sub>d(on)</sub>	V <sub>DD</sub> = -20V, V <sub>GS</sub> = -10V, R <sub>L</sub> = 2.0Ω, R <sub>GEN</sub> = 3.0Ω		9		nS
Turn-on rise time	t <sub>r</sub>			8		
Turn-off delay time	t <sub>d(off)</sub>			28		
Turn-off fall time	t <sub>f</sub>			10		
<b>Source-Drain Diode characteristics</b>						
Diode Forward Current <sup>3)</sup>	I <sub>S</sub>				-5.3	A
Diode Forward voltage <sup>2)</sup>	V <sub>DS</sub>	V <sub>GS</sub> = 0V, I <sub>S</sub> = -3.3A			-1.2	V

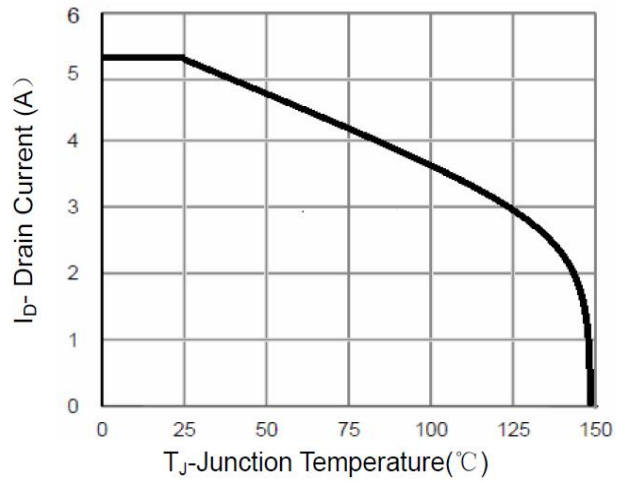
Notes:

- 1) Repetitive Rating: Pulse width limited by maximum junction temperature.
- 2) Surface Mounted on FR4 Board, t ≤ 10 sec.
- 3) Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
- 4) Guaranteed by design, not subject to production

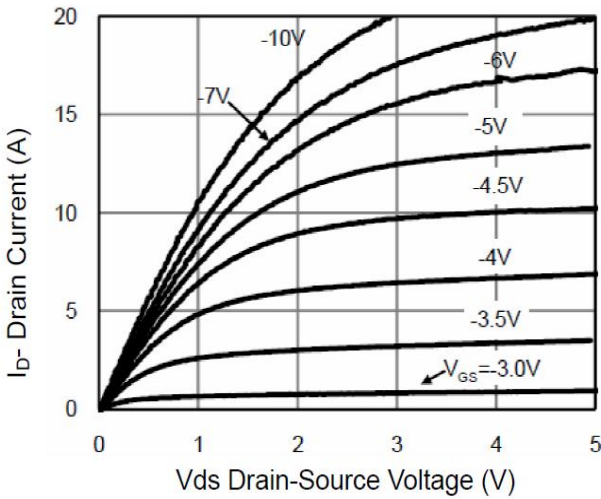
## Typical Characteristics



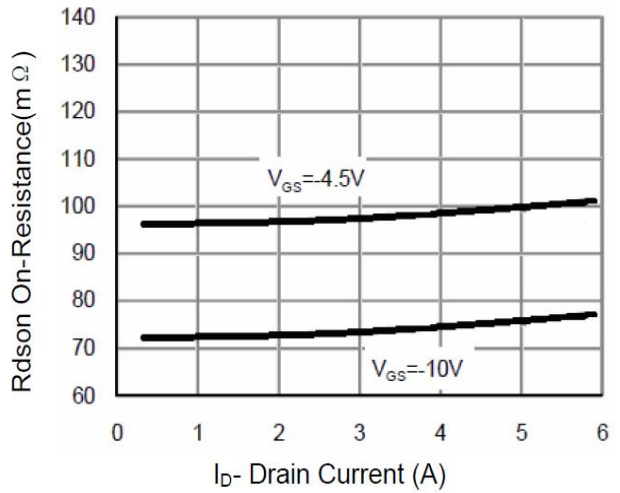
**Figure 1 Power Dissipation**



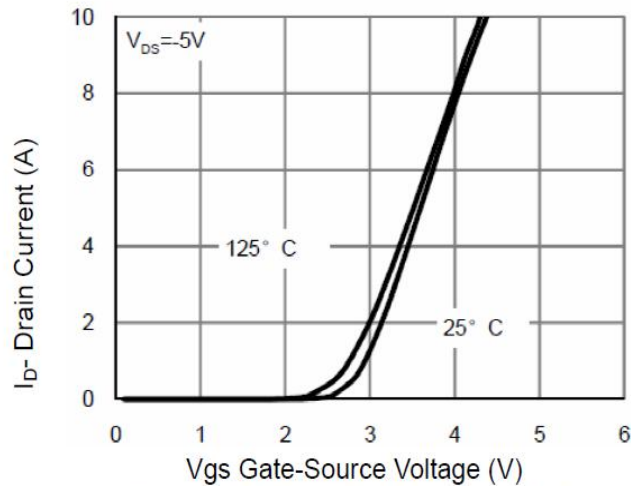
**Figure 2 Drain Current**



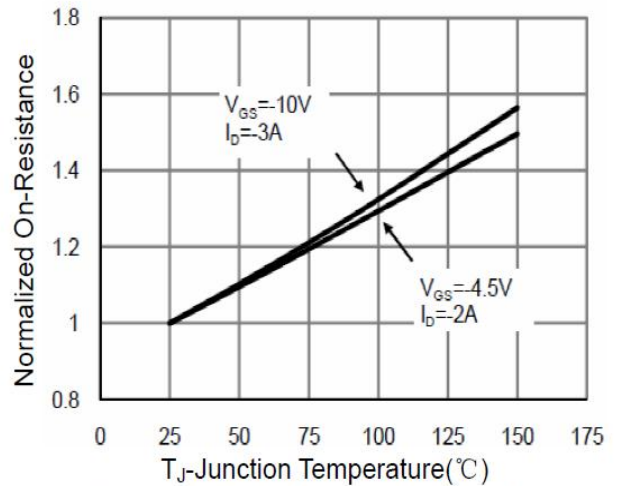
**Figure 3 Output Characteristics**



**Figure 4 Drain-Source On-Resistance**

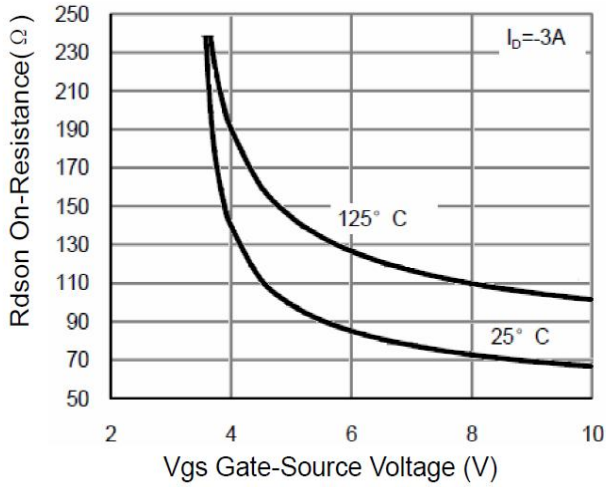


**Figure 5 Transfer Characteristics**

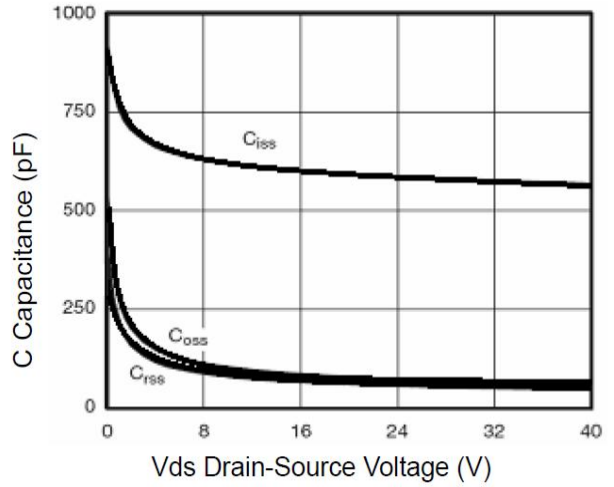


**Figure 6 Drain-Source On-Resistance**

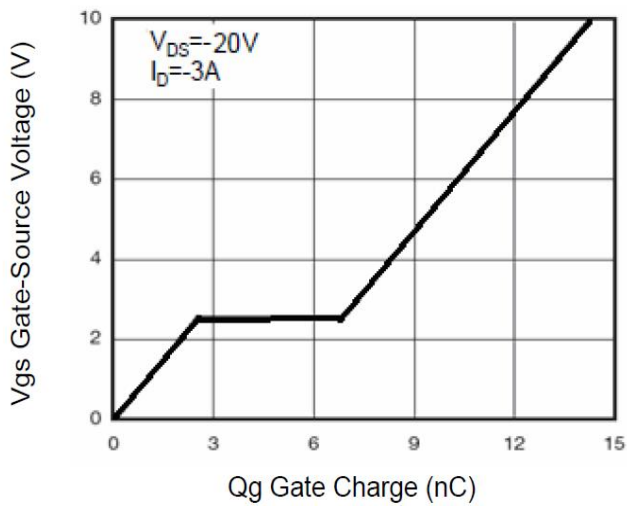
## Typical Characteristics



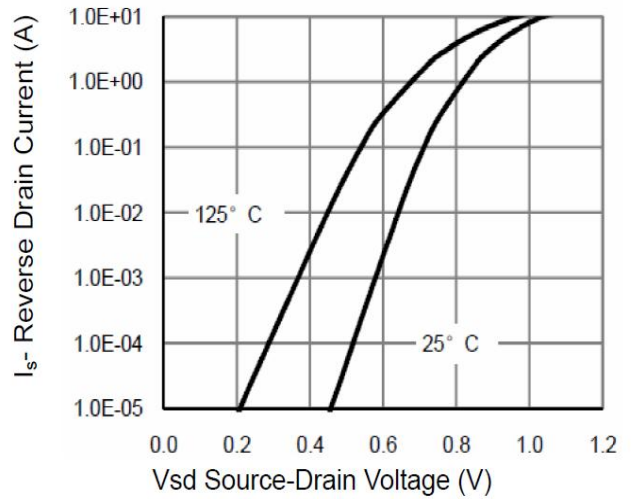
**Figure 7 Rdson vs Vgs**



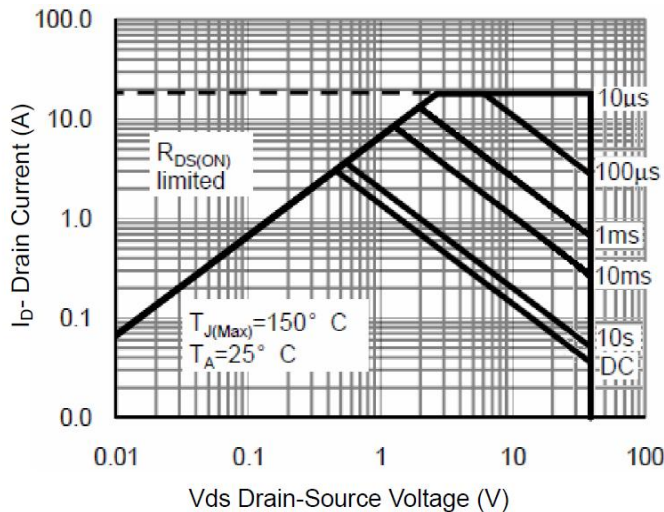
**Figure 8 Capacitance vs Vds**



**Figure 9 Gate Charge**

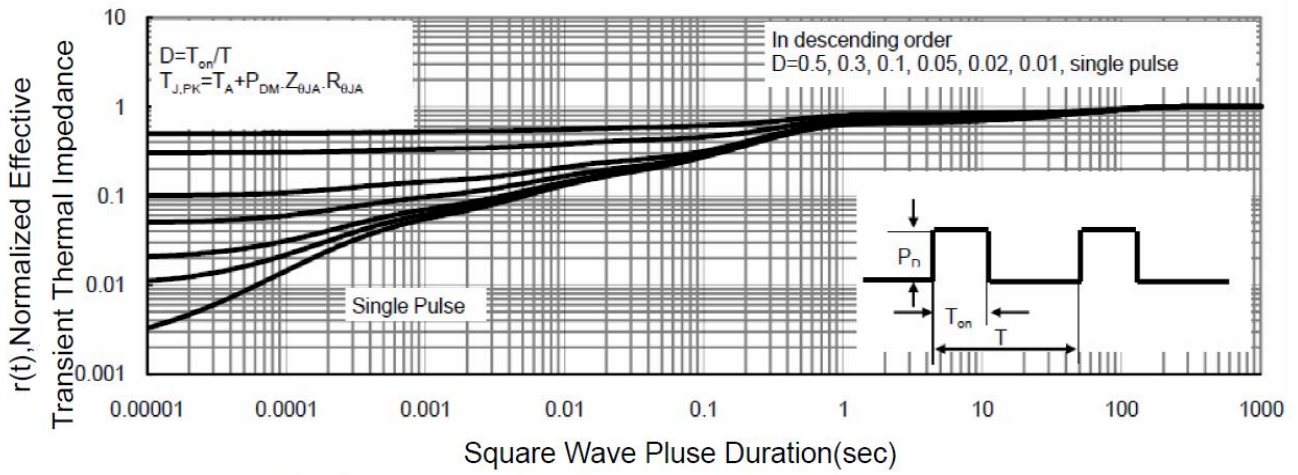


**Figure 10 Source- Drain Diode Forward**



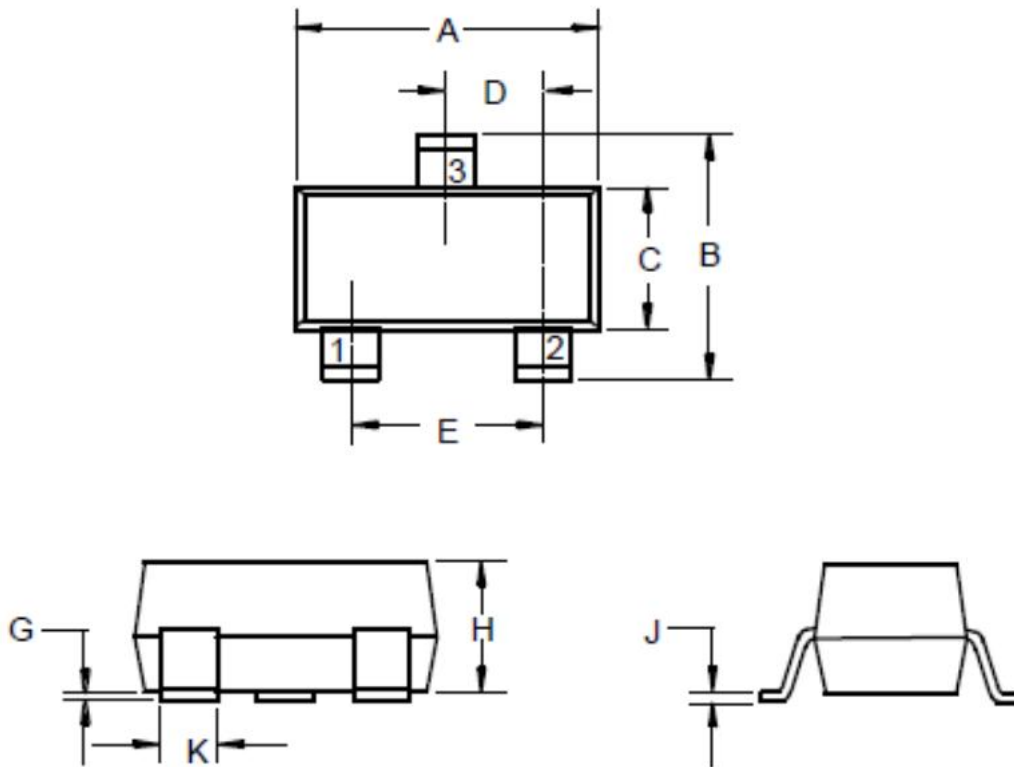
**Figure 11 Safe Operation Area**

**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