

## Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	$I_D$
20V	25mΩ@4.5V	5A
	35mΩ@2.5V	
-20V	55mΩ@4.5V	-4A
	65mΩ@2.5V	

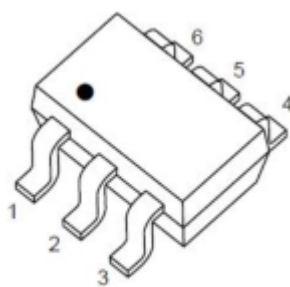
## Feature

- Low On-Resistance
- Low Input Capacitance
- Fast Switching Speed
- Low Input/Output Leakage
- Fast Switching Speed

## Applications

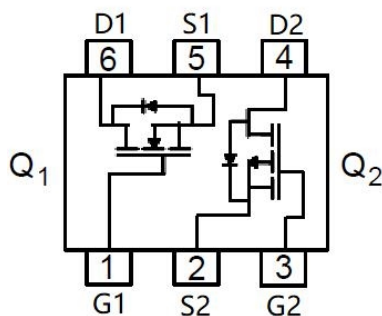
- Motor Control
- Power Management Functions
- DC-DC Converters
- Backlighting

## Package

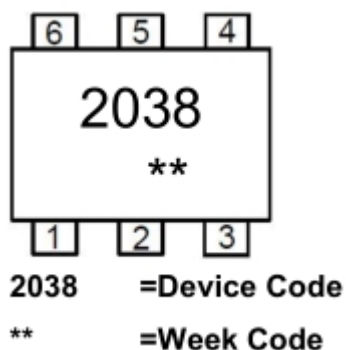


**SOT-23-6L**

## Circuit diagram



## Marking



## Maximum Ratings-Total Device

( $T_a=25^{\circ}\text{C}$  unless otherwise noted)

Parameter	Symbol	Value	Unit
Storage Temperature	$T_{\text{STG}}$	-55~ +150	$^{\circ}\text{C}$

## Maximum Ratings - N-Channel Q1

( $T_a=25^{\circ}\text{C}$  unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	$V_{\text{DS}}$	20	V
Gate-Source Voltage	$V_{\text{GS}}$	$\pm 12$	V
Continuous Drain Current	$I_{\text{D}}$	5	A

## Maximum Ratings - P-Channel Q1

(T<sub>a</sub>=25°C unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V <sub>DS</sub>	20	V
Gate-Source Voltage	V <sub>GS</sub>	±12	V
Continuous Drain Current	I <sub>D</sub>	-4	A

## Thermal Characteristics

(T<sub>a</sub>=25°C unless otherwise noted)

Parameter	Symbol	Value	Unit
Thermal Resistance from Junction to Ambient	R <sub>θJA</sub>	277	°C/W

## Electrical characteristics - N-Channel Q1

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

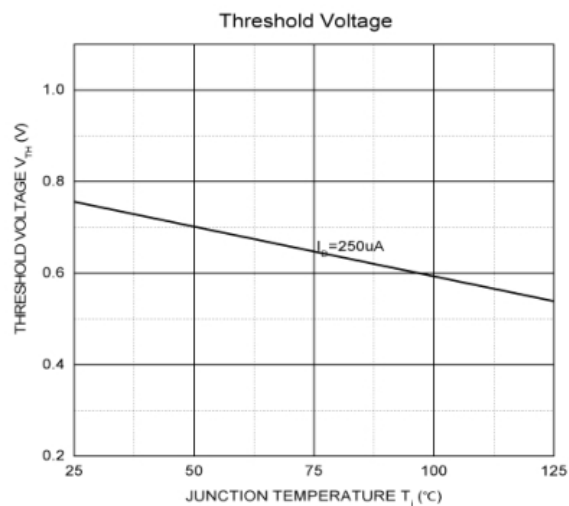
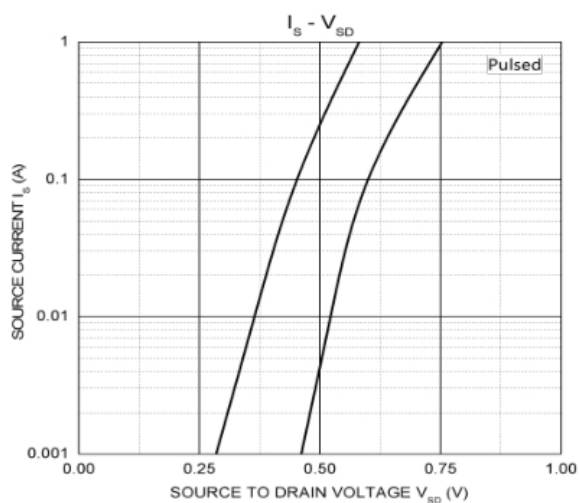
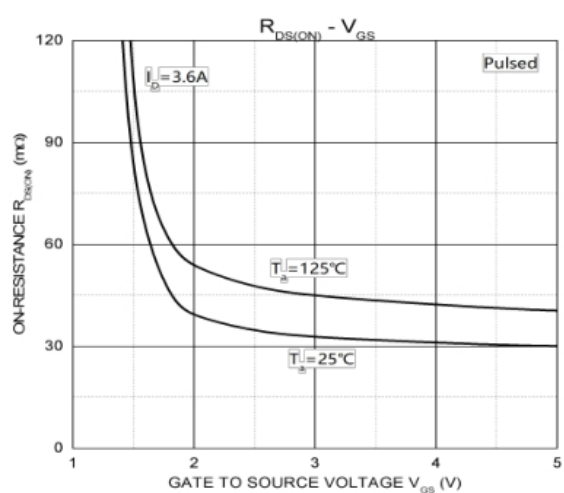
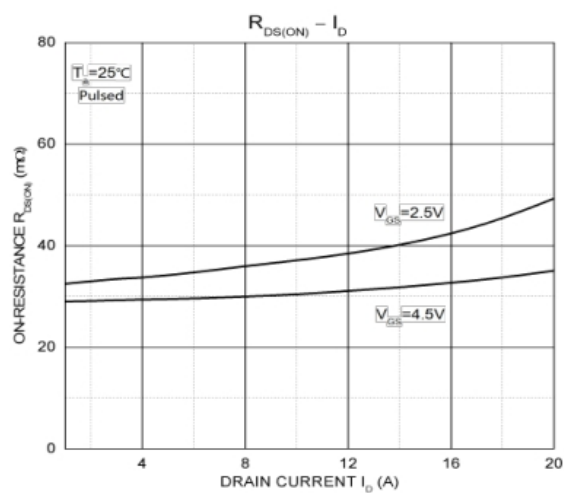
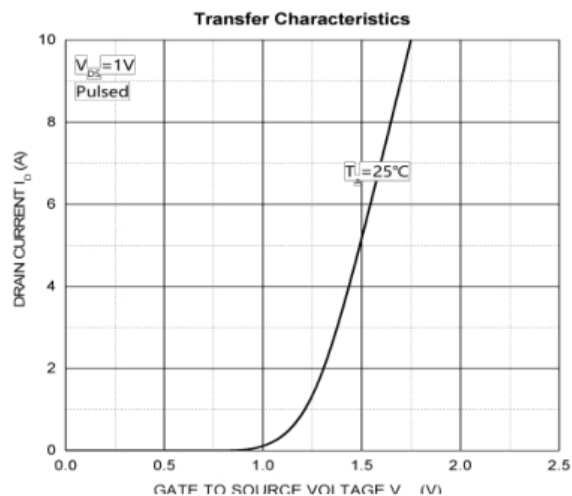
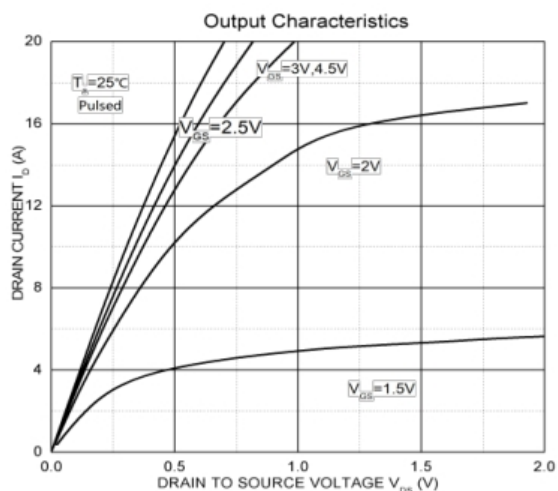
Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-source breakdown voltage	BV (BR)DSS	V <sub>GS</sub> = 0V, I <sub>D</sub> =250μA	20			V
Zero gate voltage drain current	I <sub>DSS</sub>	V <sub>DS</sub> =20V, V <sub>GS</sub> = 0V			1	uA
Gate-body leakage current	I <sub>GSS</sub>	V <sub>GS</sub> =±12V, V <sub>DS</sub> = 0V			±0.1	uA
Gate threshold voltage <sup>(1)</sup>	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	0.5	0.7	1	V
Drain-source on-resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> =4.5V, I <sub>D</sub> =4.5A		25	38	mΩ
		V <sub>GS</sub> =2.5V, I <sub>D</sub> =3.5A		35	45	
Diode forward voltage	V <sub>SD</sub>	I <sub>S</sub> =1.7A, V <sub>GS</sub> =0V		0.7	1.3	V
Dynamic Characteristics						
Total gate charge	Q <sub>g</sub>	V <sub>DS</sub> =10V, V <sub>GS</sub> =4.5V, I <sub>D</sub> =4A		11		nC
Gate-source charge	Q <sub>gs</sub>			2.3		
Gate-drain charge	Q <sub>gd</sub>			2.5		
Input capacitance	C <sub>iss</sub>	V <sub>DS</sub> =8V, V <sub>GS</sub> =0V, f=1MHz		800		pF
Output capacitance	C <sub>oss</sub>			155		
Reverse transfer capacitance	C <sub>rss</sub>			125		
Switching Characteristics						
Turn-on Delay Time	T <sub>d(on)</sub>	V <sub>DD</sub> =10V, V <sub>GS</sub> =4V, I <sub>D</sub> =1A, R <sub>GEN</sub> =10Ω		18		nS
Turn-on Rise Time	T <sub>r</sub>			5		
Turn-Off Delay Time	T <sub>d(off)</sub>			43		
Turn-Off Fall Time	t <sub>f</sub>			20		

## Electrical characteristics - P-Channel Q2

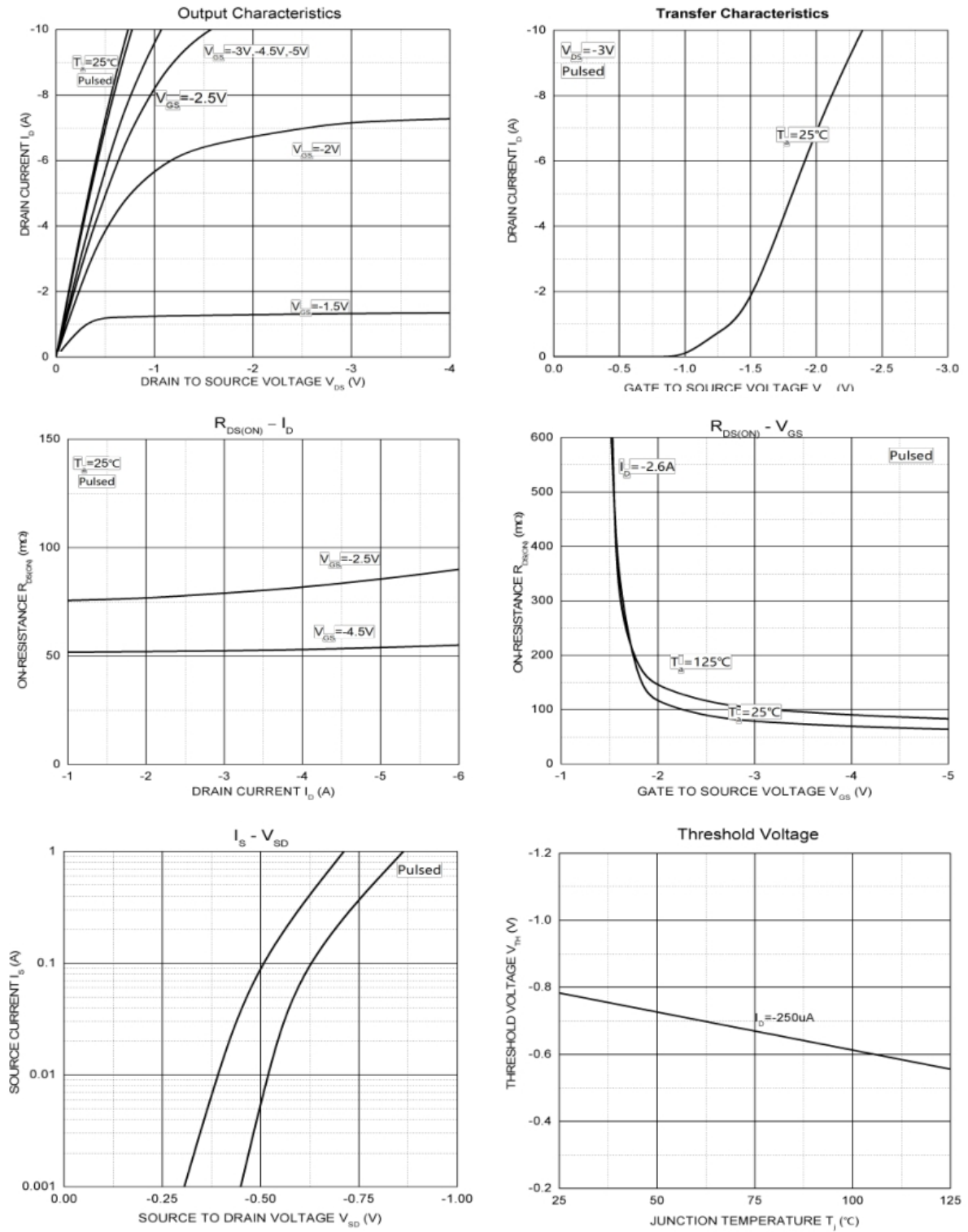
( $T_A=25^{\circ}\text{C}$ , unless otherwise noted)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-source breakdown voltage	BV (BR)DSS	V <sub>GS</sub> = 0V, I <sub>D</sub> = -250μA	-20			V
Zero gate voltage drain current	I <sub>DSS</sub>	V <sub>DS</sub> = -16V, V <sub>GS</sub> = 0V			-1	uA
Gate-body leakage current	I <sub>GSS</sub>	V <sub>GS</sub> = ±12V, V <sub>DS</sub> = 0V			±100	uA
Gate threshold voltage <sup>(1)</sup>	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> = -250μA	-0.5	-0.7	-1	V
Drain-source on-resistance <sup>(1)</sup>	R <sub>DS(on)</sub>	V <sub>GS</sub> = -4.5V, I <sub>D</sub> = -3A		55	80	mΩ
		V <sub>GS</sub> = -2.5V, I <sub>D</sub> = -2A		65	100	
Dynamic Characteristics <sup>2)</sup>						
Input capacitance	C <sub>iSS</sub>	V <sub>DS</sub> = -10V, V <sub>GS</sub> =0V, f=1MHz		405		pF
Output capacitance	C <sub>oSS</sub>			75		
Reverse transfer capacitance	C <sub>rSS</sub>			55		
Gate resistance	R <sub>g</sub>	f =1MHz		6		Ω
Total gate charge	Q <sub>g</sub>	V <sub>DS</sub> = -10V, V <sub>GS</sub> = -2.5V, I <sub>D</sub> = -3A		3.3	12	nC
Gate-source charge	Q <sub>gs</sub>			0.7		
Gate-drain charge	Q <sub>gd</sub>			1.3		
Turn-on Delay Time	T <sub>d(on)</sub>	V <sub>DS</sub> = -10V, V <sub>GEN</sub> = -4.5V, I <sub>D</sub> = -1A, R <sub>L</sub> =10Ω, R <sub>GEN</sub> =1Ω		11		nS
Turn-on Rise Time	T <sub>r</sub>			35		
Turn-Off Delay Time	T <sub>d(off)</sub>			30		
Turn-Off Fall Time	t <sub>f</sub>			10		
Source-Drain Diode Characteristics						
Diode Forward voltage	V <sub>SD</sub>	I <sub>S</sub> = -1.25A, V <sub>GS</sub> = 0V		-0.7	-1.3	V

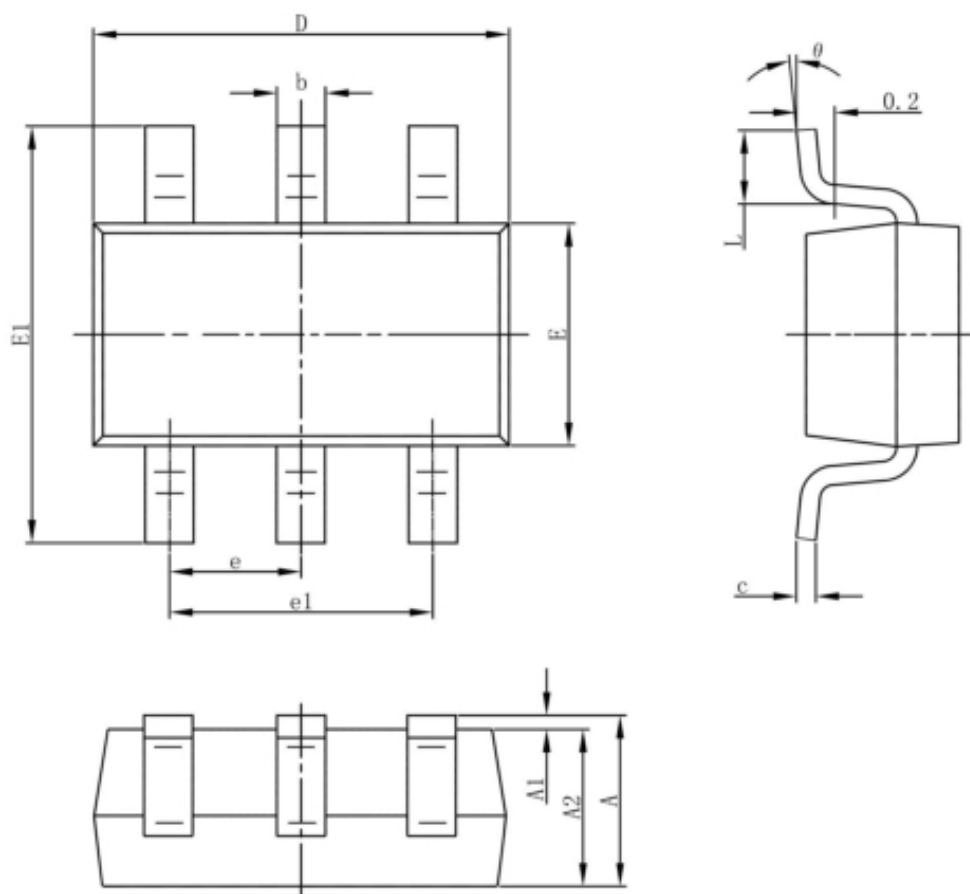
## Typical Characteristics - N-Channel Q1



## Typical Characteristics - P-Channel Q2



## SOT-23-6L Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	1.500	1.700	0.059	0.067
E1	2.650	2.950	0.104	0.116
e	0.950(BSC)		0.037(BSC)	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°