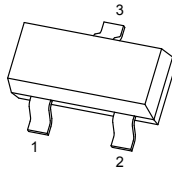


### FEATURE

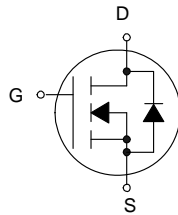
- High density cell design for low  $R_{DS(ON)}$
- Voltage controlled small signal switch
- Rugged and reliable
- High saturation current capability

### SOT-23



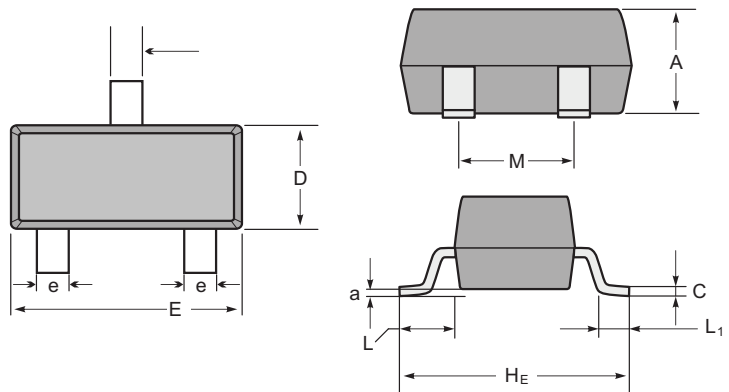
1. GATE
2. SOURCE
3. DRAIN

### Equivalent circuit



### Marking

Type number	Marking code
SI2306	A6SHB



SOT-23 mechanical data

UNIT		A	C	D	E	H <sub>E</sub>	e	M	L	L <sub>1</sub>	a
mm	max	1.1	0.15	1.4	3.0	2.6	0.5	1.95	0.55 (ref)	0.36 (ref)	0.0
	min	0.9	0.08	1.2	2.8	2.2	0.3	1.7			0.15
mil	max	43	6	55	118	102	20	77	22 (ref)	14 (ref)	0.0
	min	35	3	47	110	87	12	67			6

### Maximum Ratings and Thermal Characteristics (TA = 25°C unless otherwise noted)

Parameter	Symbol	Ratings	Unit
Drain-Source Voltage	V <sub>DS</sub>	30	V
Gate-source Voltage	V <sub>GS</sub>	±20	V
Drain Current (Continuous)	I <sub>D</sub>	3.16	A
Drain Current (Pulsed) <sup>a</sup>	I <sub>DM</sub>	10	A
Total Power Dissipation @TA=25°C	P <sub>D</sub>	0.75	W
Operating Junction and Storage Temperature Range	T <sub>j</sub> , T <sub>stg</sub>	-55 to +150	°C
Thermal Resistance Junction to Ambient (PCB mounted)	R <sub>JA</sub>	100	°C/W

# SI2306

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

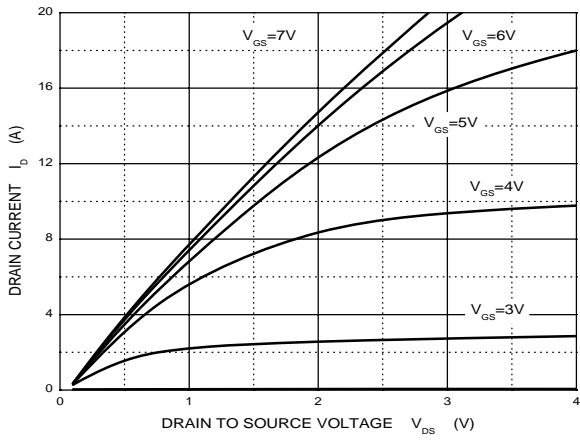
Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
<b>Static</b>						
Drain-Source Breakdown Voltage	$V_{(BR)DS}$	$V_{GS} = 0V, I_D = 250\mu A$	30			V
Gate-Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	1.0		3.0	
Gate-Body Leakage	$I_{GSS}$	$V_{DS} = 0V, V_{GS} = \pm 20V$			$\pm 100$	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = 30V, V_{GS} = 0V$			0.5	$\mu A$
Drain-Source On-Resistance <sup>a</sup>	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 3.5A$		0.038	0.047	$\Omega$
		$V_{GS} = 4.5V, I_D = 2.8A$		0.052	0.065	
Forward Transconductance <sup>a</sup>	$g_{fs}$	$V_{DS} = 4.5V, I_D = 2.5A$		7.0		S
Diode Forward Voltage	$V_{SD}$	$I_S = 1.25A, V_{GS} = 0V$		0.8	1.2	V
<b>Dynamic</b>						
Gate Charge	$Q_g$	$V_{DS} = 15V, V_{GS} = 5V, I_D = 2.5A$		3.0	4.5	nC
Total Gate Charge	$Q_{gt}$	$V_{DS} = 15V, V_{GS} = 10V, I_D = 2.5A$		6	9	
Gate-Source Charge	$Q_{gs}$			1.6		
Gate-Drain Charge	$Q_{gd}$			0.6		
Gate Resistance	$R_g$	$f = 1.0MHz$	2.5	5	7.5	$\Omega$
Input Capacitance	$C_{iss}$	$V_{DS} = 15V, V_{GS} = 0V, f = 1MHz$		305		pF
Output Capacitance	$C_{oss}$			65		
Reverse Transfer Capacitance	$C_{rss}$			29		
<b>Switching</b>						
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = 15V,$ $R_L = 15\Omega, I_D \approx 1A,$ $V_{GEN} = 10V, R_g = 6\Omega$		7	11	ns
Rise Time	$t_r$			12	18	
Turn-Off Delay Time	$t_{d(off)}$			14	25	
Fall Time	$t_f$			6	10	

**Notes :**

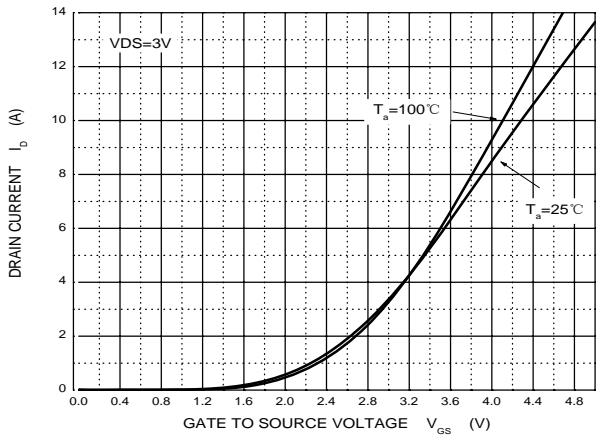
a. Pulse Test : Pulse Width  $\leq 300\mu s$ , duty cycle  $\leq 2\%$ .

# RATING AND CHARACTERISTIC CURVES (SI2306)

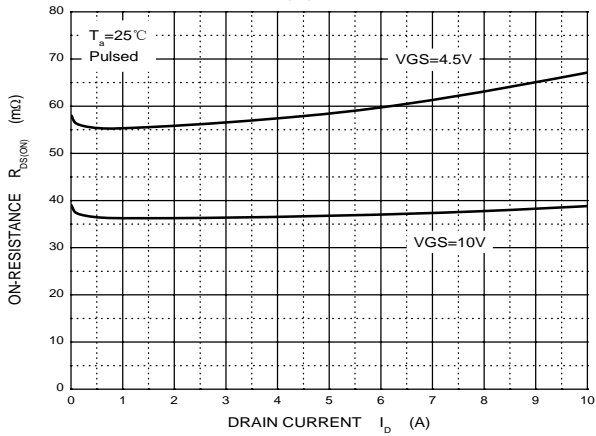
**Output Characteristics**



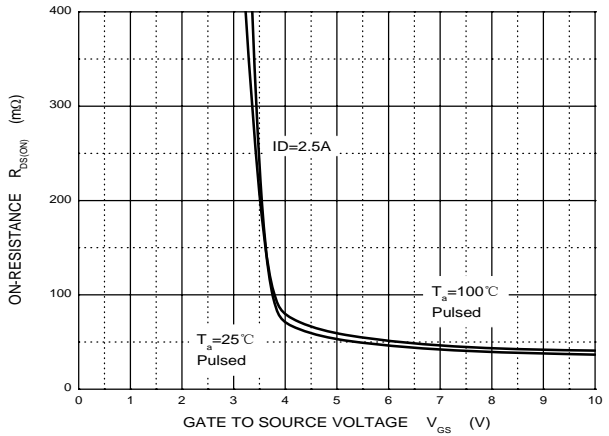
**Transfer Characteristics**



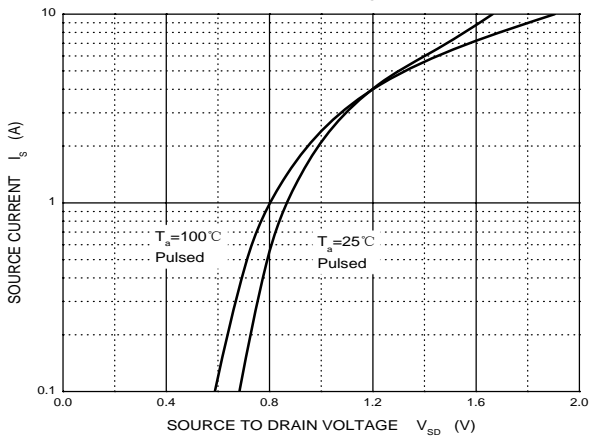
**$R_{DS(ON)}$  —  $I_D$**



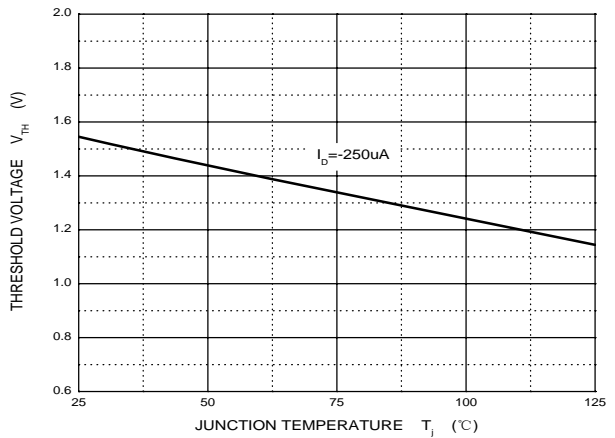
**$R_{DS(ON)}$  —  $V_{GS}$**



**$I_S$  —  $V_{SD}$**



**Threshold Voltage**



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