

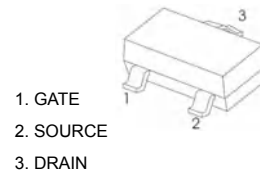
FEATURES

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

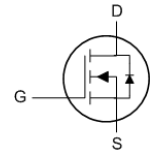
V_{DSS} 30 V
 I_D 3.16 A
 $R_{DS(ON)}$ 38 m Ω

A6SHB

SOT-23



Equivalent Circuit



MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Maximum Ratings and Thermal Characteristics ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Ratings	Unit
Drain-Source Voltage	V_{DS}	30	V
Gate-source Voltage	V_{GS}	± 20	V
Drain Current (Continuous)	I_D	3.16	A
Drain Current (Pulsed) ^a	I_{DM}	10	A
Total Power Dissipation @ $T_A=25^\circ\text{C}$	P_D	0.75	W
Operating Junction and Storage Temperature Range	T_j, T_{stg}	-55 to +150	$^\circ\text{C}$
Thermal Resistance Junction to Ambient (PCB mounted)	R_{JA}	100	$^\circ\text{C/W}$

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

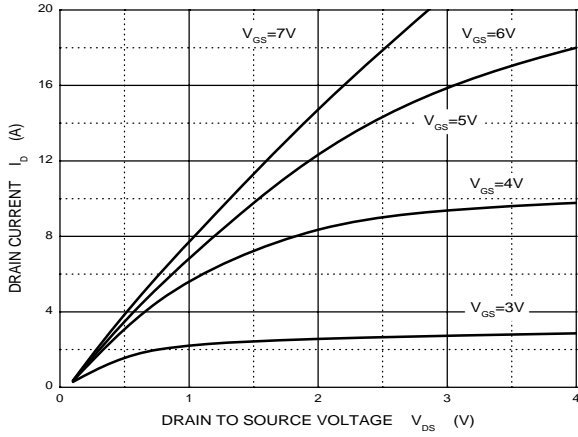
Parameter	Symbol	Test Condition	Min	Typ	Max	Unit	
Static							
Drain-Source Breakdown Voltage	$V_{(BR)DS}$	$V_{GS} = 0V, I_D = 250\mu A$	30			V	
Gate-Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	1.0		3.0		
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0V, V_{GS} = \pm 20V$			± 100	nA	
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 30V, V_{GS} = 0V$			0.5	μA	
Drain-Source On-Resistance ^a	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 3.5A$		0.038	0.047	Ω	
		$V_{GS} = 4.5V, I_D = 2.8A$		0.052	0.065		
Forward Transconductance ^a	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	
Dynamic							
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	Ω	
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		
Switching							
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 :

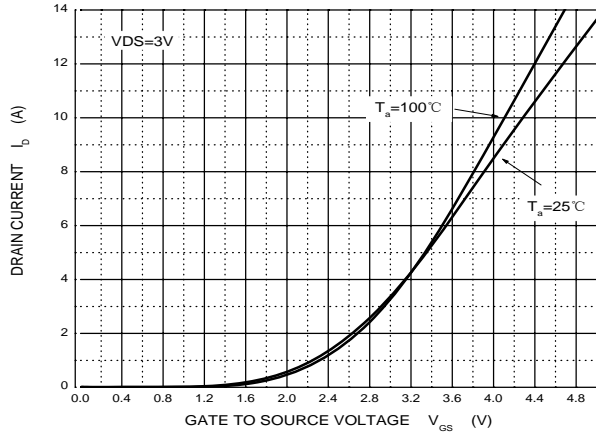
a.Pulse Test : Pulse Width \leq 300 μ s, duty cycle \leq 2%.

RATING AND CHARACTERISTIC CURVES

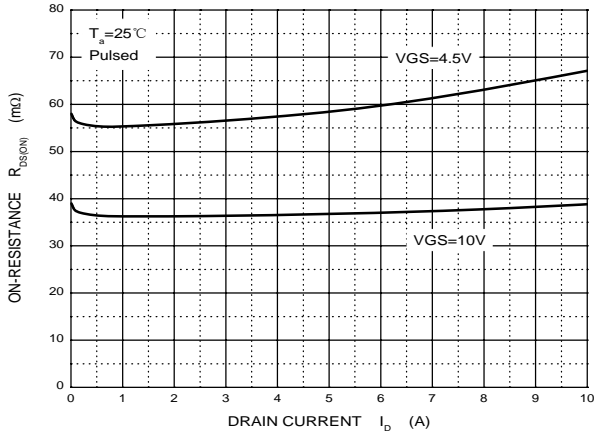
Output Characteristics



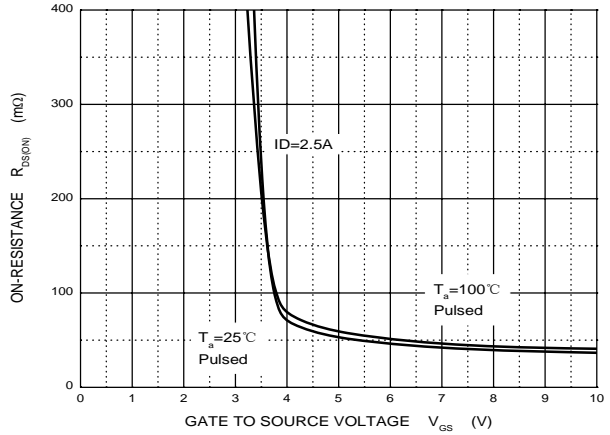
Transfer Characteristics



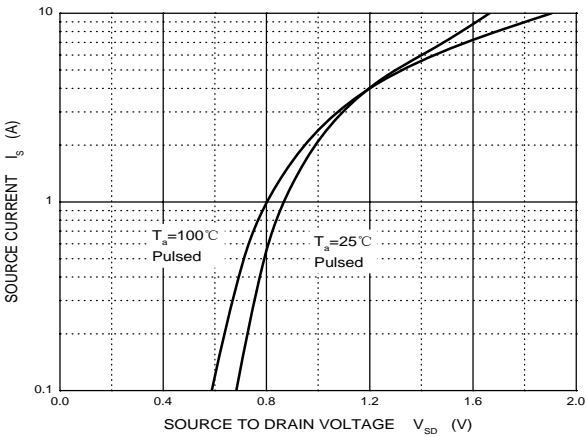
$R_{DS(ON)}$ — I_D



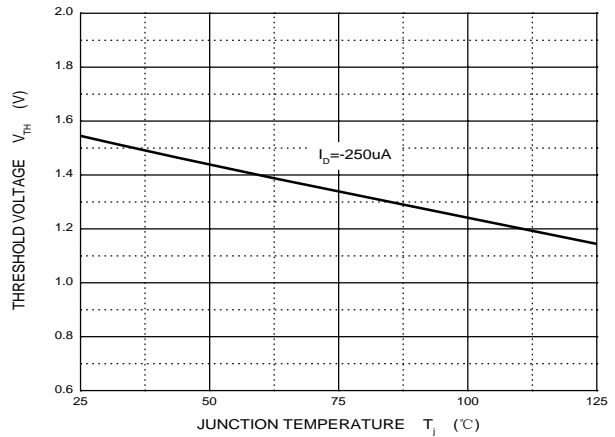
$R_{DS(ON)}$ — V_{GS}



I_S — V_{SD}



Threshold Voltage



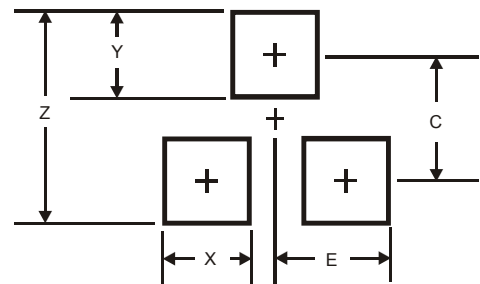
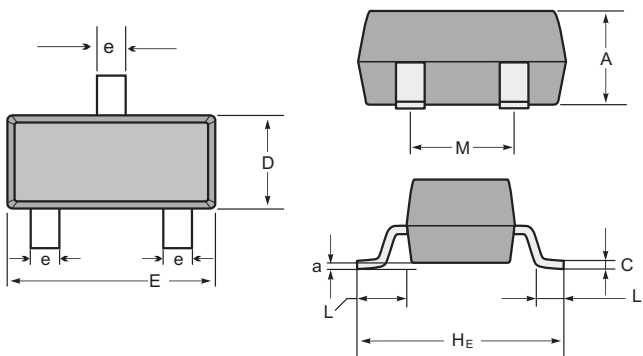
Soldering parameters

Reflow Condition		Pb-Free assembly (see as below)
Pre Heat	-Temperature Min ($T_{s(min)}$)	+150°C
	-Temperature Max($T_{s(max)}$)	+200°C
	-Time (Min to Max) (ts)	60-180 secs.
Average ramp up rate (Liquid us Temp (T_L) to peak)		3°C/sec. Max
$T_{s(max)}$ to T_L - Ramp-up Rate		3°C/sec. Max
Reflow	-Temperature(T_L)(Liquid us)	+217°C
	-Temperature(t_L)	60-150 secs.
Peak Temp (T_P)		+260(+0/-5)°C
Time within 5°C of actual Peak Temp (t_p)		30 secs. Max
Ramp-down Rate		6°C/sec. Max
Time 25°C to Peak Temp (T_P)		8 min. Max
Do not exceed		+260°C



Package Dimensions & Suggested Pad Layout

SOT23



SOT-23 mechanical data

UNIT		A	C	D	E	H_E	e	M	L	L_1	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

Dimensions	SOT23
Z	2.9
X	0.8
Y	0.9
C	2.0
E	1.35

Tape & reel specification

Tape		Symbol	Dimension (mm)
		P0	4.00±0.10
		P1	4.00±0.10
		P2	2.00±0.10
		D0	1.55±0.10
		D1	1.05±0.10
		E	1.55±0.10
		F	3.60±0.10
		W	8.00±0.10
		A0	3.80±0.20
		B0	3.25±0.20
		K0	1.45±0.10
		T	0.25±0.05
		D2	178.0±3.0
		D3	55Min.
7" Reel		D4	R24.0±3.0
		G	R82.0±3.0
		I	13.0±2.0
		W1	11.0±3.0
		Quantity: 3000PCS	