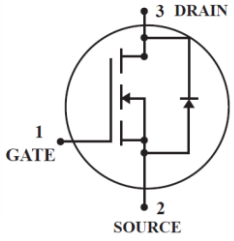
N-CHANNEL SMD POWER MOSFET

DESCRIPTION:



The ALPSBSS123 is an 100V N-Channel enhanced mode power MOSFET.

The ALPSBSS123 has Low On-Resistance @ max 6.0Ω, typical input: 42.7pF & out: 14pF capacity, threshold of max 2.0v with fast switching speed (typ 20ns) Lead free RoHS complaint component.

FEATURES:

- Low On-Resistance: 6.0 Ω
- Low Input Capacitance: typ 42.7pF
- Low Output Capacitance: 14pF
- Low Threshold: max 2.0V
- Fast Switching Speed: typ 20ns
- Lead free parts meet RoHS Compliant
- Suffix "-H" indicated Halogen Free part, ex. ALPSBSS123-H

APPLICATIONS:

- DC to DC Converter
- Cellular & PCMCIA Card
- Cordless Telephone
- Power Management in Portable and Battery etc.

MAXIMUM RATINGS

MAXIMUM RATINGS @ T_A = 25 °C unless otherwise specified					
PARAMETER	**SYMBOL**	**MIN**	**TYP.**	**MAX**	**UNIT**
Drain-Source Voltage	V_{DSS}			100	V
Gate-Source Voltage Non-repetitive (tp ≤ 50µs)	V_{GS} V_{GSM}			±20 ±40	V V
Continuous[1] Drain Current	I_D			170	mA
Pulsed[2] Drain Current	I_{DM}			680	mA
Total Power Dissipation FR-5 Board[3] T_A=25 °C Derated above 25 °C	P_D			225 1.8	mW mW/°C
Typical Thermal Resistance Junction to Ambient	$R_{\theta JA}$		556		°C/W
Operating Junction Temperature Range	T_J	-55		150	°C
Storage Temperature Range	T_{stg}	-55		150	°C

Note:

[1] – The power dissipation of the package may result in a lower continuous drain current.

[2] – Pulse Width ≤ 300 µs, Duty Cycle ≤ 2.0%

[3] – FR-5 = 1.0 x 0.75 x 0.062 in

ELECTRICAL CHARACTERISTICS @ TA = 25 °C unless otherwise specified

STATIC CHARACTERISTICS

PARAMETER	SYMBOL	MIN	TYP.	MAX	UNIT
Off Characteristics					
Drain-Source Breakdown Voltage VGS=0V, ID=250 µA	B_{VDSS}	100			V
Zero Gate Voltage Drain Current V_{DS}=100V, V_{GS}=0V, T_j=125 °C V_{DS}=100V, V_{GS}=0V, T_j=125 °C	I_{DSS}			15 60	µA
Gate-body Leakage Current V_{GS}= 20V, V_{DS}= 0V	I_{GSS}			50	nA
On Characteristics[4]					
Gate-Threshold Voltage V_{DS} = V_{GS}, I_D = 1.0 mA	$V_{GS(th)}$	0.8		2.8	V
Static Drain-to-Source On-Resistance V_{GS} = 10V, I_D = 100mA	$R_{DS(ON)}$		5.0	6.0	Ω
Forward Trans Conductance V_{GS} = 0V, I_D = 100 mA	g_{fs}	8.0			S

DYNAMIC CHARACTERISTICS

PARAMETER	SYMBOL	MIN	TYP.	MAX	UNIT
Input Capacitance V_{DS} = 25V, V_{GS} = 0V, f = 1.0 MHz	C_{iss}		42.7		pF
Output Capacitance V_{DS} = 25V, V_{GS} = 0V, f = 1.0 MHz	C_{oss}		14		pF
Reserve Transfer Capacitance V_{DS} = 25V, V_{GS} = 0V, f = 1.0 MHz	C_{rss}		3.0		pF
Total Gate Charge V_{DS} = 10V, V_{GS} = 10V, I_D = 0.22A	Q_g		6.32		nC
Gate-Source Charge V_{DS} = 10V, V_{GS} = 10V, I_D = 0.22A	Q_{gs}		1.55		nC
Gate-Drain Charge V_{DS} = 10V, V_{GS} = 10V, I_D = 0.22A	Q_{gd}		0.68		nC

SWITCHING CHARACTERISTICS[4]

PARAMETER	SYMBOL	MIN	TYP.	MAX	UNIT
Turn-On Delay Time V_{CC} = 30V, I_C = 0.28A, V_{GS} = 10V, R_{GS} = 50Ω	$t_{d(on)}$		20		nS
Turn-Off Delay Time V_{CC} = 30V, I_C = 0.28A, V_{GS} = 10V, R_{GS} = 50Ω	$t_{d(off)}$		40		nS

REVERSE DIODE

PARAMETER	SYMBOL	MIN	TYP.	MAX	UNIT
Diode Forward On-Voltage I_D = 0.34A, V_{GS} = 0V	V_{SD}			1.3	V

Note: [4] – Pulse test: Pulse width ≤ 300µs, duty cycle ≤ 2.0%

TYPICAL DEVICE RATING AND CHARACTERISTICS CURVES (T_A = 25 °C unless otherwise noted)

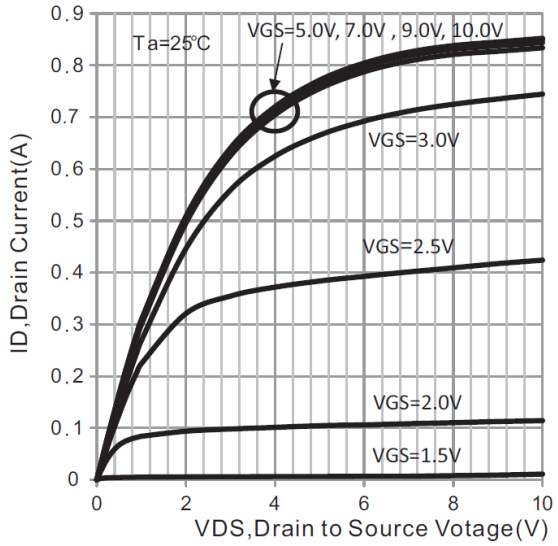


Fig.1 I_D vs V_{DS}

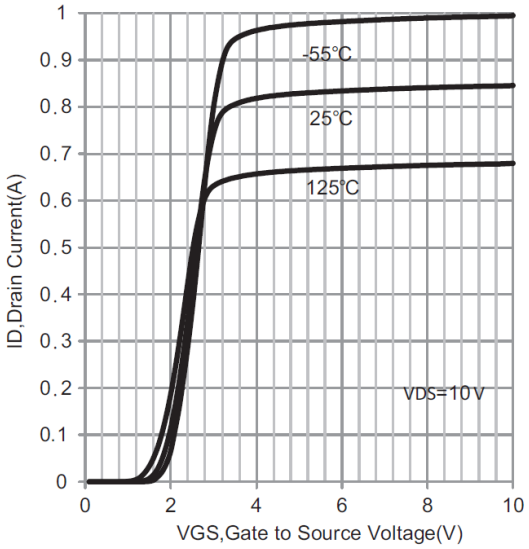


Fig.2 I_D vs V_{GS}

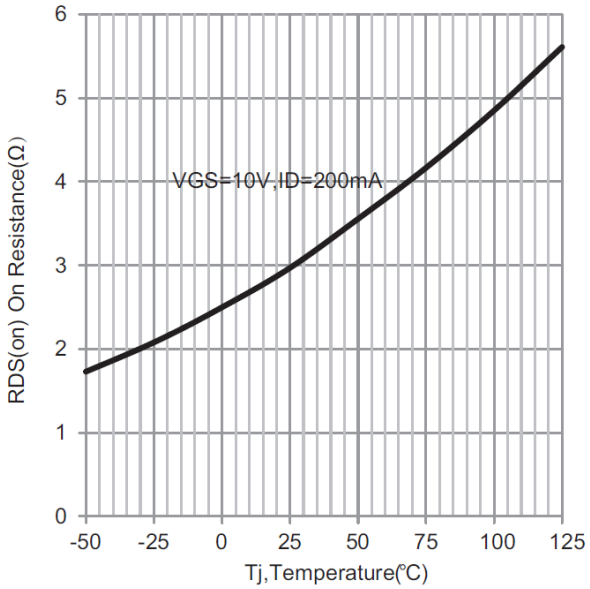


Fig.3 $R_{DS(on)}$ vs T_j

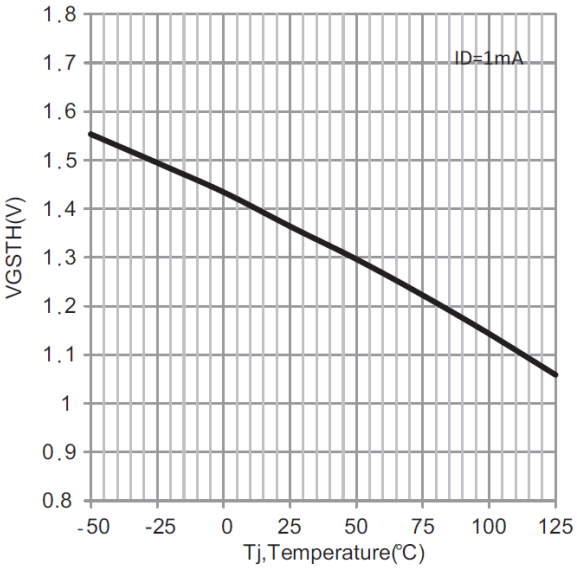
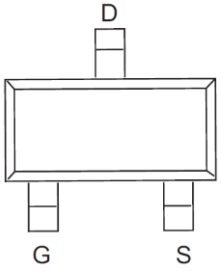
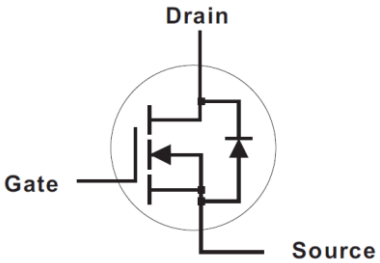


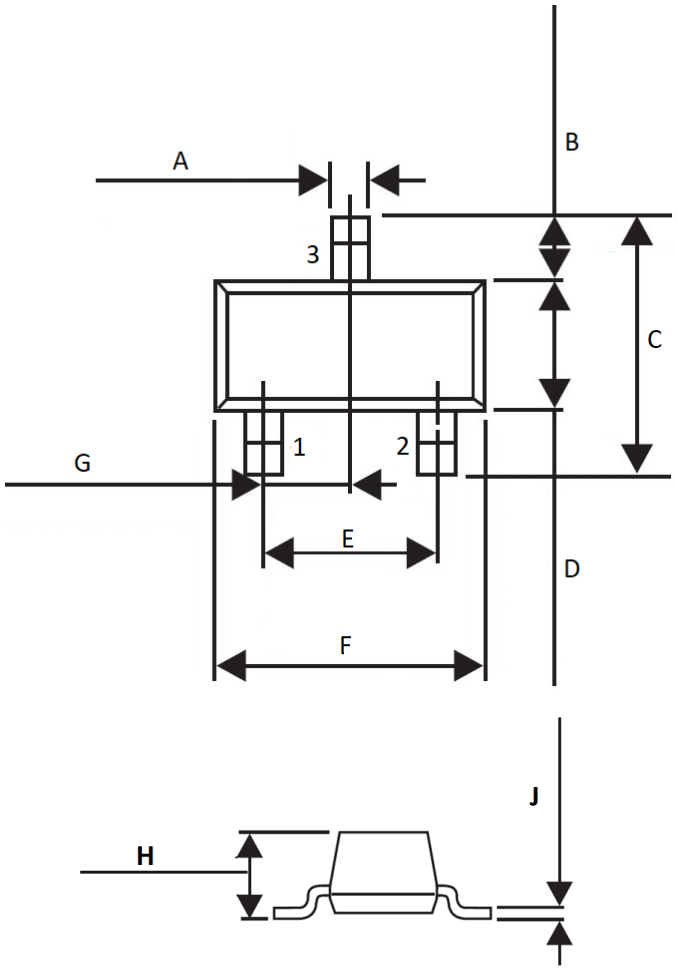
Fig.4 $V_{GS(th)}$ vs T_j

PINNING INFORMATION

PIN	SIMPLIFIED OUTLINE	SYMBOL
PinD Drain PinG Gate PinS Source		

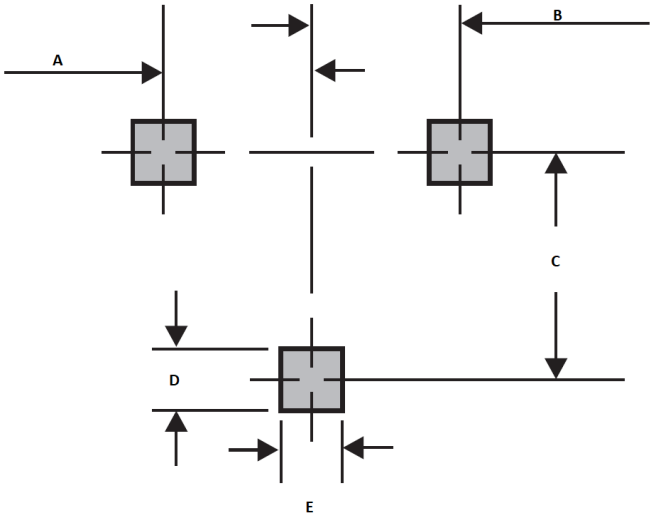
PACKAGE INFORMATION

SOT-23



OUTLINE DIMENSIONS				
	MILLIMETERS		INCHES	
SYMBOL	MIN	MAX	MIN	MAX
A	0.30	0.50	0.012	0.020
B	0.32	0.67	0.013	0.027
C	2.10	2.75	0.083	0.108
D	1.20	1.60	0.047	0.063
E	1.70	2.10	0.068	0.084
F	2.80	3.04	0.110	0.120
G	0.85	1.05	0.034	0.041
H	0.89	1.30	0.035	0.051
J	0.09	0.18	0.003	0.007

PAD LAYOUT

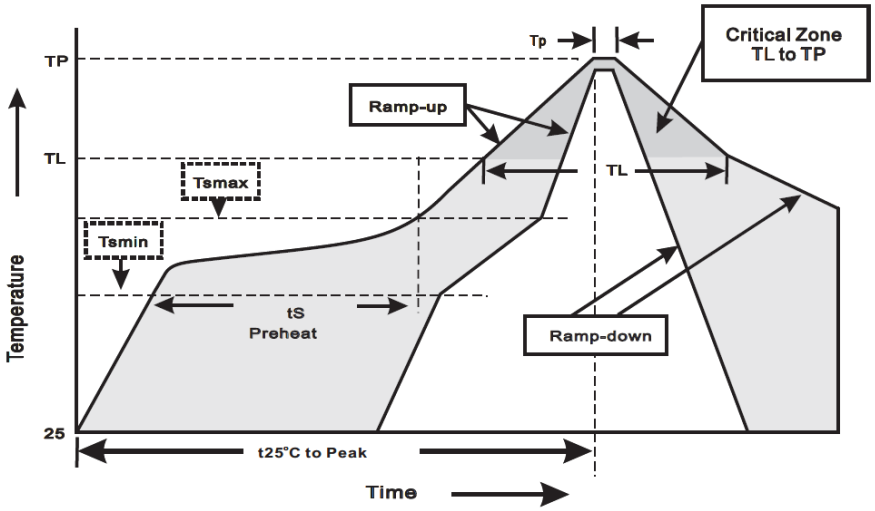


OUTLINE DIMENSIONS		
SYMBOL	MILLIMETERS	INCHES
A	0.95	0.037
B	0.95	0.037
C	2.00	0.079
D	0.90	0.035
E	0.80	0.031

SOLDERING PARAMETERS

SUGGESTED THERMAL PROFILES FOR SOLDERING PROCESSES

1. Storage environment: Temperature=5 °C~40 °C Humidity=55% ±25%
2. Reflow soldering of surface-mount devices



3. Reflow soldering

PROFILE FEATURE	SOLDERING CONDITION
Average ramp-up rate (T_L to T_P)	<3 °C/sec
Preheat - Temperature Min (T_{smin}) - Temperature Max (T_{smax}) - Time (min to max) (t_s)	 150 °C 200 °C 60 ~ 120 sec
T_{smax} to T_L - Ramp-upRate	 <3 °C/sec
Time maintained above: - Temperature (T_L) - Time(tL)	 217 °C 60 ~ 260 sec
Peak Temperature (T_P)	255 °C-0/+5 °C
Time within 5 °C of actual Peak Temperature(tP)	10 ~ 30 sec
Ramp-down Rate	<6 °C/sec
Time 25 °C to Peak Temperature	<6 minutes

CUSTOMER NOTE:

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2. In Europe, please dispose as per EU Directive 2002/96/EC on Waste Electrical and Electronic Equipment (WEEE).

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