

WAS4736

MIC/GND Cross-point Switch for CITA and OMTP Mobile Audio Key Application

<http://www.sh-willsemi.com>

Descriptions

The WAS4736 is an audio jack detection switch for CITA and OMTP 4-pole accessories. The pin MIC is on audio key side, as WAS4736' O1/O2 is plugged into audio jack of cell phone, it will detect the locations of ground (GND) and microphone (MIC) poles on the audio plug and automatically routes them to the appropriate connections.

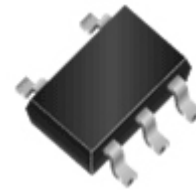
The MIC switch' Ron is 5 Ω (typical) while the Ground switch has a low Ron of 0.5 Ω (typical) to minimize voltage drop across it, preventing undesired increase in ground reference voltage.

As VCC is power-up, WAS4736 is enabled and it consumes ultra-low quiescent current, less than 600nA (typical). The range of signal swing in transmission can be rail-to-rail (0~VCC), even WAS4736 can tolerate signal swing higher than VCC but less than VCC+3V with very little inverse leakage into VCC supply and not any damage of the device. The speed of signal is recommended not more than 300KHz.

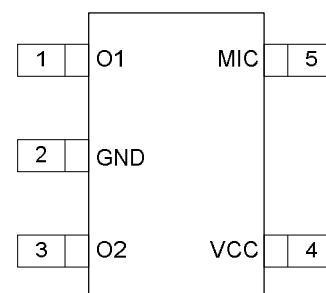
The WAS4736 is available in SOT-353 package. Standard product is Pb-Free and halogen-Free.

Features

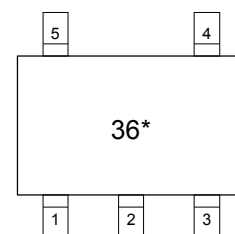
- Supply voltage range : 2.3 ~ 5.5V
- Detects polarity of GND and MIC on 4-pole plugs
- Automatically routes GND and MIC to audio jack terminals
- low R_{DS(on)} for MIC Switch (5 Ω) and GND switch (0.5 Ω)
- Ultra-Low quiescent current, < 600nA (typical)
- ESD Rating (MIL-STD-883J / Method 3015.8)
 - ◆ IO to GND : ±8KV
 - ◆ Power to GND : ±8KV



SOT-353(SC70-5)



Pin configuration (Top view)



36 = Device code

*** = Month (A~Z)**

Marking

Order information

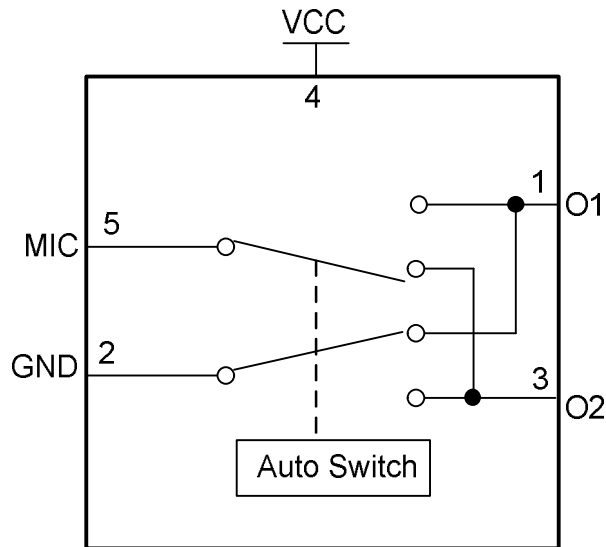
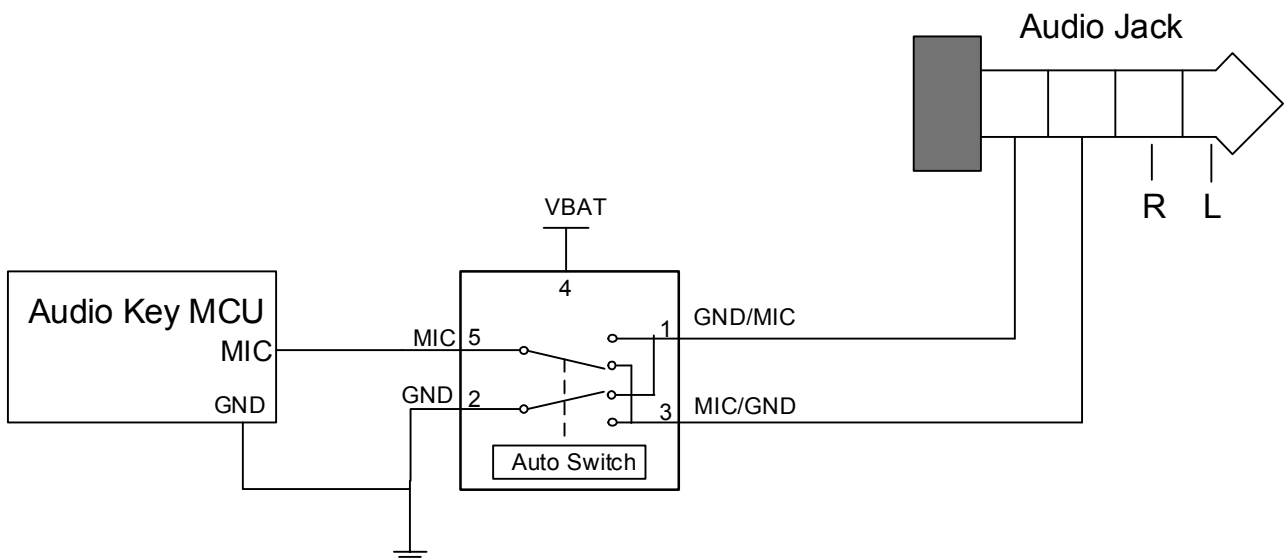
Device	Package	Shipping
WAS4736B-5/TR	SOT-353	3000/Reel&Tape

Applications

- Mobile Audio Key

Pin descriptions

Pin Number	Symbol	Descriptions
1	O1	Output One that connects to pole 4(or 3) of Audio Jack
2	GND	Ground
3	O2	Output Two that connects to pole 3(or 4) of Audio Jack
4	VCC	Power Supply that supports 2.3v ~ 5.5v
5	MIC	MIC input from Audio Key

Functional Block

Typical Applications


Absolute Maximum Ratings ⁽¹⁾

Parameter		Symbol	Value	Unit
Supply Voltage		V_{CC}	-0.3 ~ 6.5	V
Control Input Voltage		V_{INx}	-0.3 ~ 6.5	V
DC Input Voltage ⁽²⁾		V_{INPUT}	-0.3 ~ 6.5	V
Continuous Current through COMx			±100	mA
Storage Temperature Range		T_{STG}	-65 ~ 150	°C
Junction Temperature under Bias		T_J	150	°C
Lead Temperature (Soldering, 10 seconds)		T_L	260	°C
Power Dissipation		P_D	250	mW
ESD	HBM (MIL-STD-883H/Method 3015.8)	IO to GND	±8	KV
		Power to GND	±8	KV
	MM (JESD22-A115)	IO to GND	±900	V
		Power to GND	±900	V

Recommend operating ratings ⁽³⁾

Parameter		Symbol	Value	Unit
Supply Voltage Operating		V_{CC}	2.3 ~ 5.5	V
Control Input Voltage		V_{IN}	0.0 ~ V_{CC}	V
Input Signal Voltage		V_{IS}	0.0 ~ V_{CC}	V
Operating Temperature		T_A	-40 ~ 85	°C
Input Raise and Fall Time(Control Input $V_{CC}=2.3\sim 5.5V$)		t_r, t_f	0 ~ 10	ns/V
Thermal Resistance		$R_{\theta JA}$	350	°C/W

Note:

1. "Absolute Maximum Ratings" may cause permanent damage to the device. This is a stress only rating and operation of the device at these or any other conditions beyond those indicated in the operational sections of this specification is not implied.
2. The input and output negative voltage ratings may be exceeded if the input and output diode current ratings are observed.

DC Electronics Characteristics (Ta=25°C, VCC=3.6V, unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Supply quiescent current	I _{CC}	VCC is power-up		600		nA
GND path On-Resistance	R _{ON-GND}			0.5		Ω
MIC path On-Resistance	R _{ON-MIC}			5		Ω

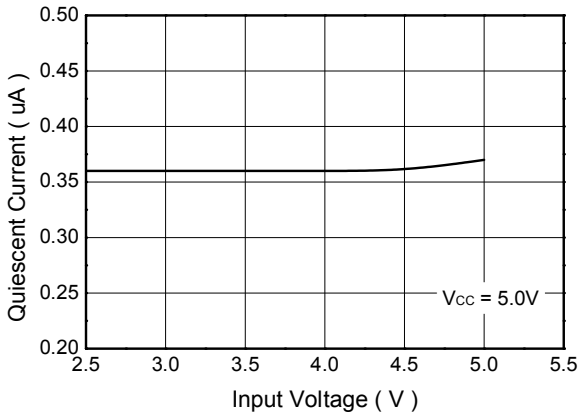
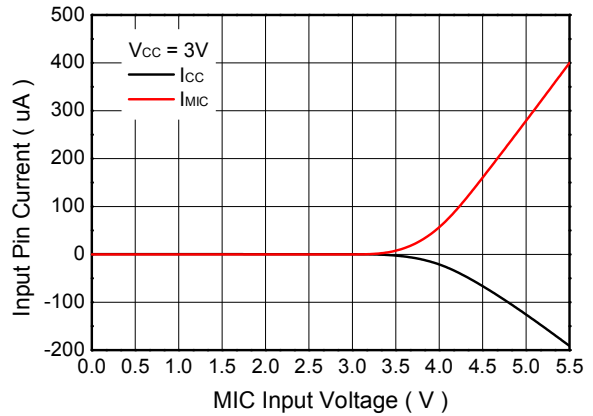
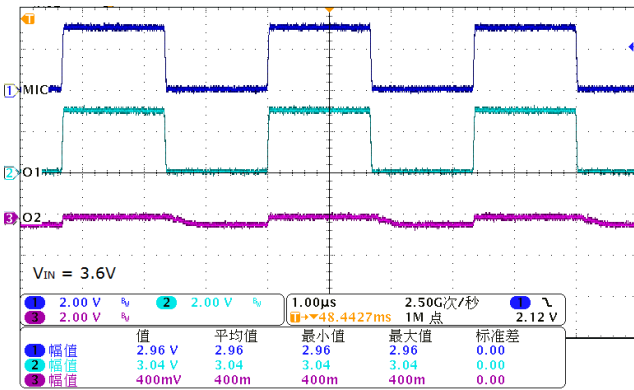
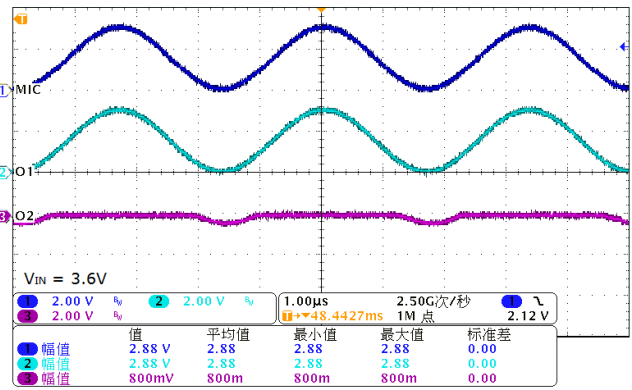
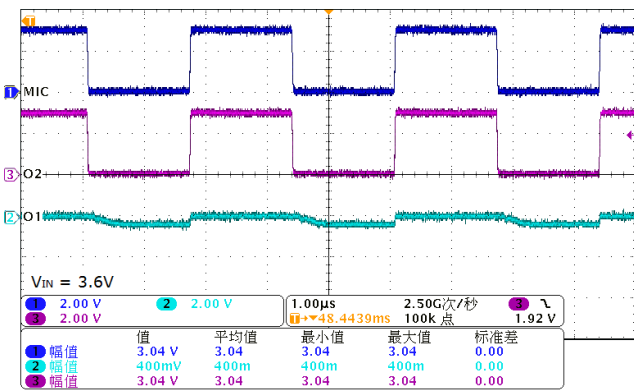
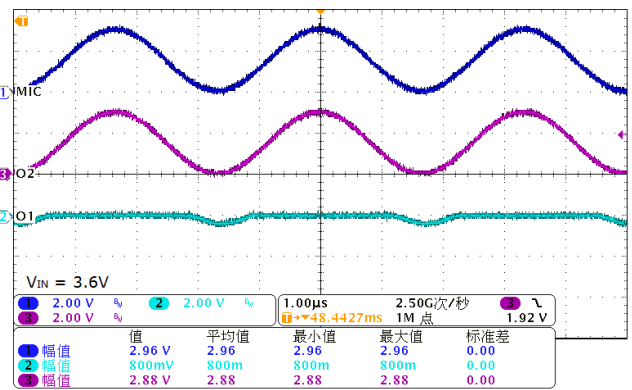
AC Electronics Characteristics (Ta=25°C, VCC=3.6V, unless otherwise noted)

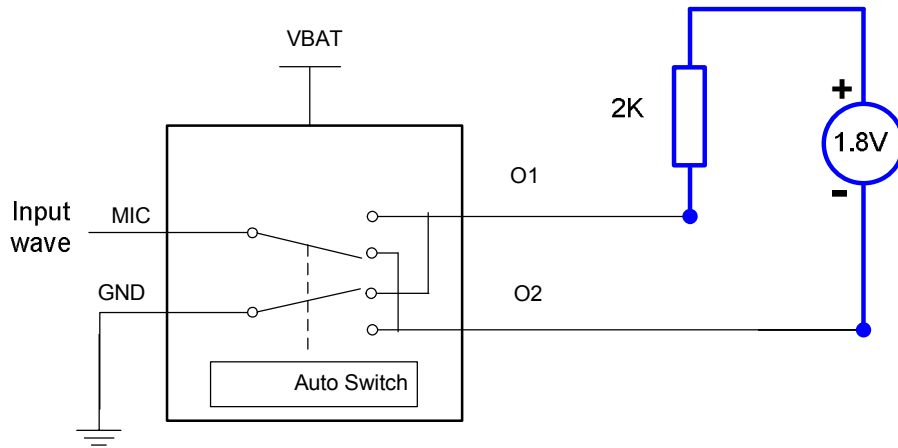
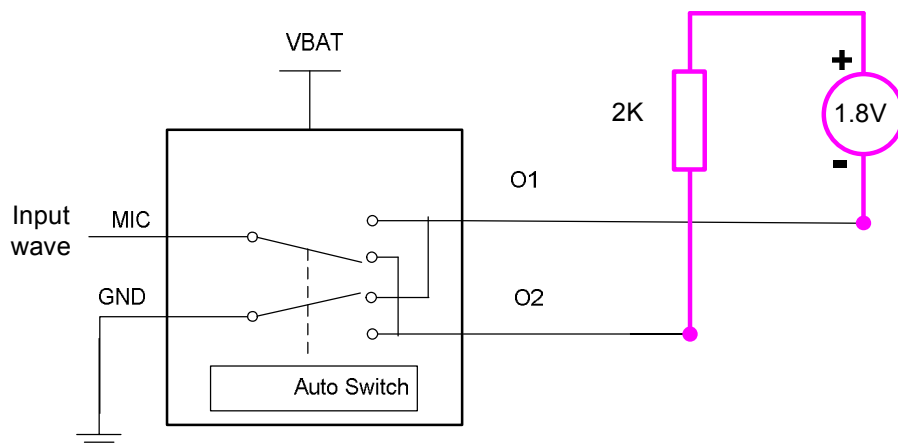
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
MIC path -3dB Bandwidth	BW	MIC Bias=1.8V MIC pull-up resistor =2K		50		MHz

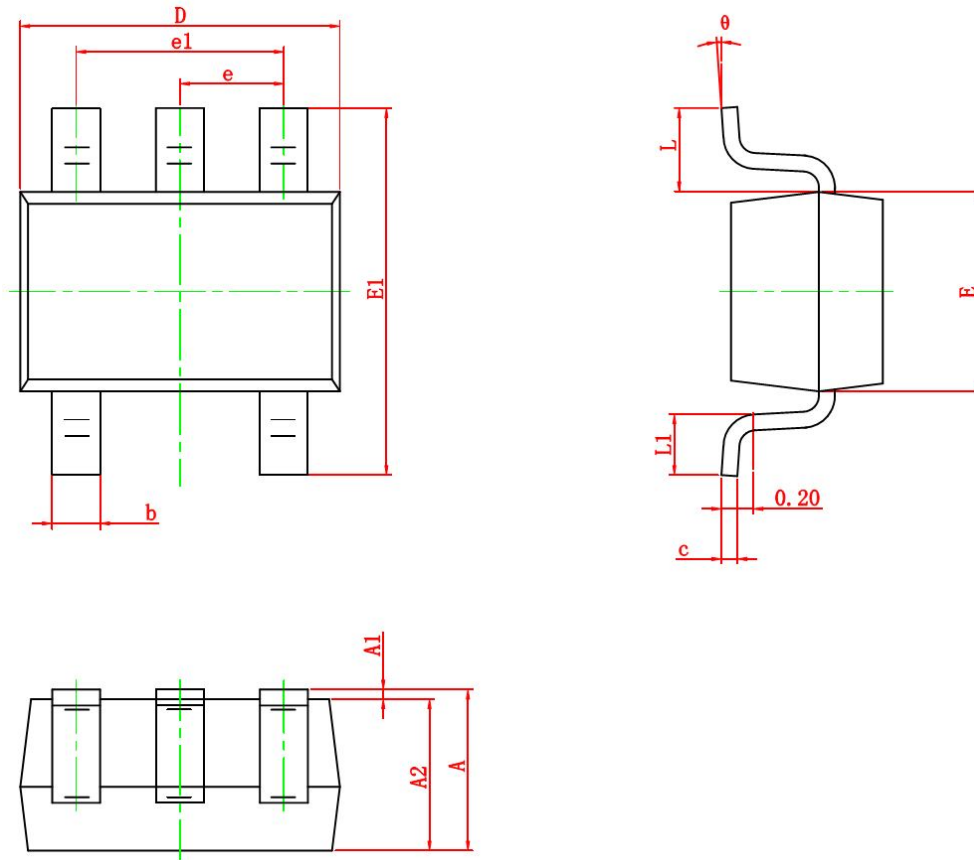
(Not tested but guaranteed by design)

Capacitance (Ta=25°C unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Off capacitance	C _{OFF}	F=100KHz, VCC=3.3		100		pF
On capacitance	C _{ON}	F=100KHz, VCC=3.3		140		pF

Typical Characteristics (Ta=25°C, unless otherwise noted)

Quiescent Current vs. Input Voltage

Input Pin Current vs. MIC Input Voltage

CTIA_USA Test (Square Wave)

CTIA_USA Test (Sine Wave)

OMTF_EUR Test (Square Wave)

OMTF_EUR Test (Sine Wave)

Test Circuit

CTIA_USA Test Circuits

OMTF_EUR Test Circuits

Package Information
SOT-353


Symbol	Dimensions In Millimeters	
	Min.	Max.
A	0.900	1.100
A1	0.000	0.100
A2	0.900	1.000
b	0.150	0.350
c	0.080	0.150
D	2.000	2.200
E	1.150	1.350
E1	2.150	2.450
e	0.650 Typ.	
e1	1.2	1.4
L	0.525 Ref.	
L1	0.260	0.460
θ	0°	8°