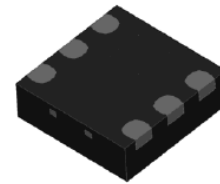
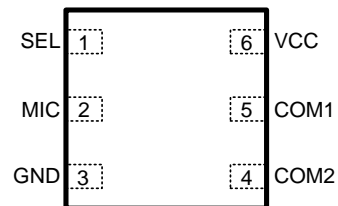
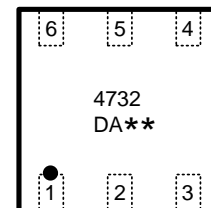


**WAS4732D**
**MIC/GND Cross-point Switch for EU/US  
Headphone Compatible Application**
<http://www.sh-willsemi.com>
**Descriptions**

The WAS4732D is a 2x2 cross-point switch that is used to interchange the Ground and MIC connections on a headphone connector. The Ground switch has an ultra-low Ron of 0.1  $\Omega$  (typical) to minimize voltage drop across it, preventing undesired increase in headphone ground reference voltage. the switch state is controlled via the SEL input. When SEL=High, GND is connected to COM2 and MIC is connected to COM1; When SEL=Low, GND is connected to COM1 and MIC is connected to COM2. An internal pull-down 2M $\Omega$  resistor on SEL input sets the default state of the switch.


**DFN2x2-6L**

**Pin configuration (Top view)**


**4732** = Device code  
**\*\*** = Year & Week (A-Z)  
**Marking**

**Features**

- Supply voltage : 2.3 ~ 5.0V
- ultra-low Ron for GND Switch : 100m $\Omega$
- low Ron for MIC Switch : 4.5  $\Omega$
- Break-Before-Make Switching
- Low quiescent current over an Expanded Control Input Range
- ESD Rating (HBM JEDEC: JESD22-A114)
  - ◆ IO to GND :  $\pm 8KV$
  - ◆ Power to GND :  $\pm 5KV$
- Replace TS3A26746E with compatible PCB Layout

**Applications**

- Cell phone
- Tablet
- Others Music Players

**Order information**

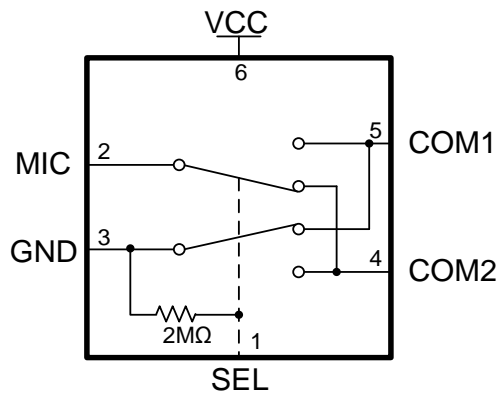
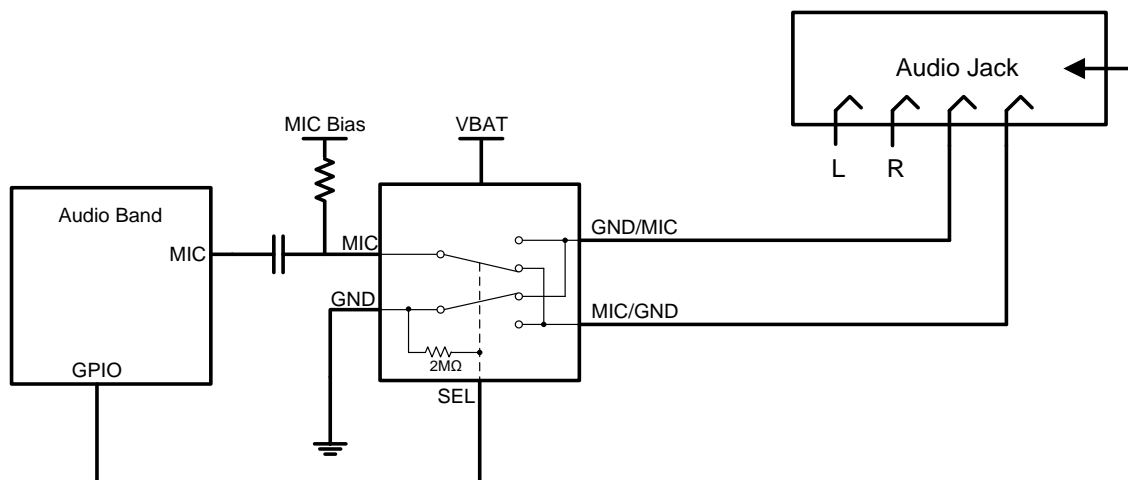
Device	Package	Shipping
WAS4732D-6/TR	DFN2x2-6L	3000/Reel&Tape

**Pin descriptions**

Pin Number	Symbol	Descriptions
1	SEL	Logic Control
2	MIC	MIC Port
3	GND	Ground
4,5	COM <sub>x</sub>	Audio Signal Port
6	VCC	Positive Power Supply

**Function descriptions**

Logic Input (SEL)	Function
0	GND is connected to COM1 and MIC is connected to COM2
1	GND is connected to COM2 and MIC is connected to COM1

**Functional Block**

**Typical Applications**


**Absolute Maximum Ratings <sup>(1)</sup>**

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 <sup>(2)</sup>	$V_{INPUT}$	-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

**Recommend operating ratings <sup>(3)</sup>**

Parameter	Symbol	Value	Unit
Supply Voltage Operating	$V_{CC}$	2.3 ~ 5.0	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 $V_{CC}=2.3\sim 3.6V$ )	$t_r, t_f$	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.
3. Control input must be held high or Low, it must not float.

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

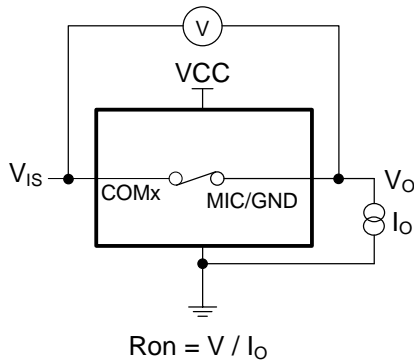
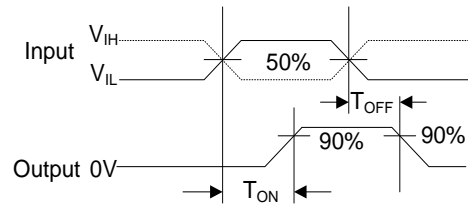
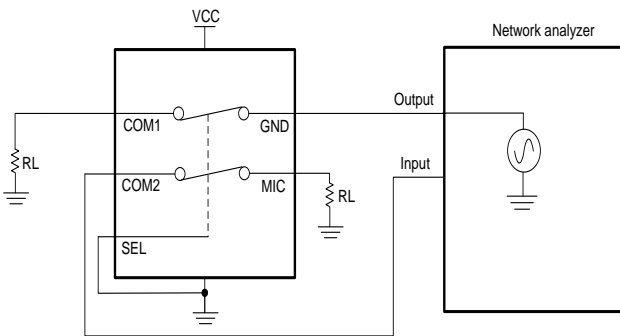
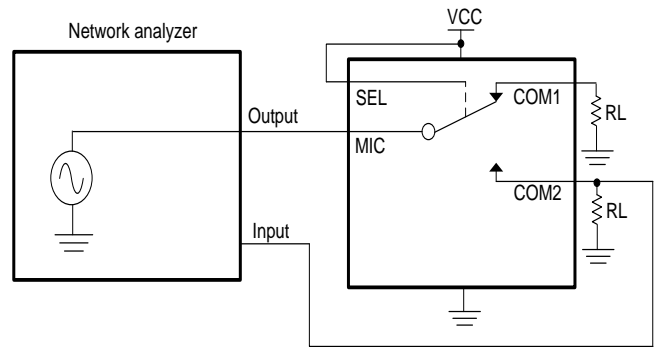
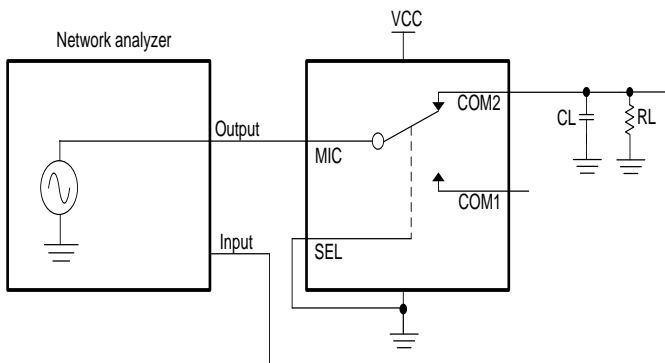
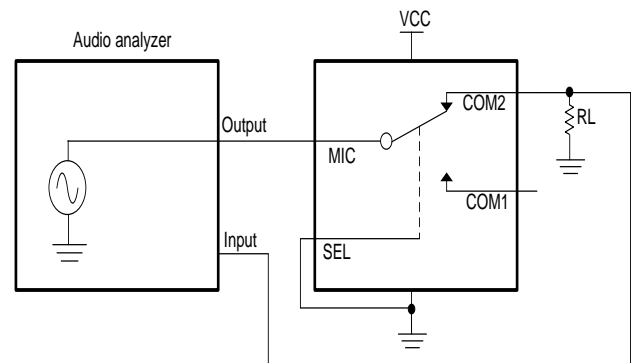
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Input logic high level	V <sub>IH</sub>	VCC: 3.0 ~ 4.5	1.6			V
		VCC: 2.3 ~ 3.0	1.4			V
Input logic low level	V <sub>IL</sub>	VCC: 3.0 ~ 4.5			0.6	V
		VCC: 2.3 ~ 3.0			0.4	V
Supply quiescent current	I <sub>CC</sub>	I <sub>OUT</sub> =0, V <sub>IN</sub> =0 or V <sub>IN</sub> =VCC			1.0	μA
Increase in I <sub>CC</sub> per input	I <sub>CCT</sub>	I <sub>OUT</sub> =0, VCC=4.5 V <sub>IN</sub> >1.8 or V <sub>IN</sub> <0.5			2.0	μA
SEL Input leakage current	I <sub>IN</sub>	V <sub>SEL</sub> =VCC			2.0	μA
Off state switch leakage current	I <sub>OFF</sub>				±1.0	μA
On state switch leakage current	I <sub>ON</sub>				±1.0	μA
GND path On-Resistance	R <sub>ON1</sub>	VCC=2.8V, V <sub>SW</sub> = 0 ~ 1V I <sub>OUT</sub> =32mA			0.1	Ω
GND path On-Resistance match	Δ R <sub>ON1</sub>	VCC =2.8V, V <sub>SW</sub> = 0 ~ 1V I <sub>OUT</sub> =32mA			0.02	Ω
GND path On-Resistance flatness	R <sub>FLAT1(ON)</sub>	VCC=2.8V, V <sub>SW</sub> = 0 ~ 1V I <sub>OUT</sub> =32mA			0.02	Ω
MIC path On-Resistance	R <sub>ON2</sub>	VCC=2.8V, V <sub>SW</sub> = 0 ~ 1.8V I <sub>OUT</sub> =32mA			4.5	Ω
MIC path On-Resistance match	Δ R <sub>ON2</sub>	VCC =2.8V, V <sub>SW</sub> = 0 ~ VCC I <sub>OUT</sub> =32mA			0.5	Ω
MIC path On-Resistance flatness	R <sub>FLAT2(ON)</sub>	VCC=2.8V, V <sub>SW</sub> = 0 ~ 1.8V I <sub>OUT</sub> =32mA			1.5	Ω

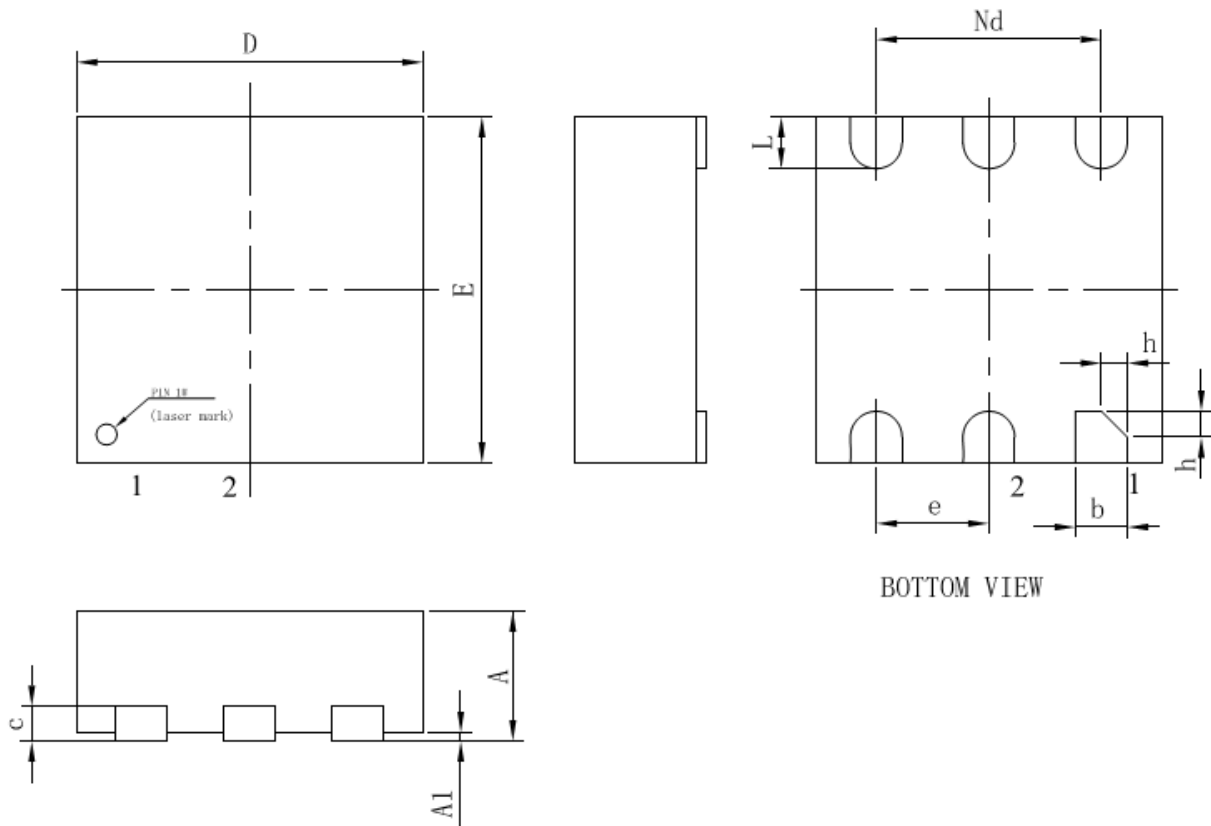
**AC Electronics Characteristics (Ta=25°C, VCC=3.6V, unless otherwise noted)**

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Turn-On Time	T <sub>ON</sub>	V <sub>IS</sub> =1.5V, C <sub>L</sub> =35pF, R <sub>L</sub> =50Ω		150		ns
Turn-Off Time	T <sub>OFF</sub>	V <sub>IS</sub> =1.5V, C <sub>L</sub> =35pF, R <sub>L</sub> =50Ω		150		ns
Break-Before-Make time	T <sub>BBM</sub>	V <sub>IS</sub> =1.5V, C <sub>L</sub> =35pF, R <sub>L</sub> =50Ω		800		ns
-3dB Bandwidth	BW	R <sub>L</sub> =50Ω, C <sub>L</sub> =0pF		30		MHz
Off isolation	OIRR	F=1KHz, R <sub>L</sub> =50Ω		-50		dB
		F=10KHz, R <sub>L</sub> =50Ω		-50		dB
Crosstalk	Xtalk	F=1KHz, R <sub>L</sub> =50Ω		-50		dB
		F=10KHz, R <sub>L</sub> =50Ω		-50		dB
Total Harmonic Distortion (MIC)	THD	F=20Hz to 20KHz R <sub>L</sub> =1KΩ, V <sub>IS</sub> =30mVpp		0.01		%

**Capacitance (Ta=25°C unless otherwise noted)**

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Off capacitance	C <sub>OFF</sub>	F=100KHz, VCC=3.3		100		pF
On capacitance	C <sub>ON</sub>	F=100KHz, VCC=3.3		140		pF

**Test Circuits**

**ON-Resistance ( $R_{ON}$ )**

**ON/OFF Time Waveforms ( $T_{ON} / T_{OFF}$ )**

**Crosstalk ( $X_{talk}$ )**

**Off isolation ( $OIRR$ )**

**Bandwidth ( $BW$ )**

**THD+N**

**Package Information**
**DFN2x2-6L**


Symbol	Dimensions in millimeter		
	Min.	Typ.	Max.
A	0.70	0.75	0.80
A1	0.00	0.02	0.05
D	1.95	2.00	2.05
E	1.95	2.00	2.05
b	0.25	0.30	0.35
c	0.18	0.20	0.25
e	0.65 BSC.		
Nd	1.30 BSC.		
L	0.25	0.30	0.40
h	0.10	0.15	0.20