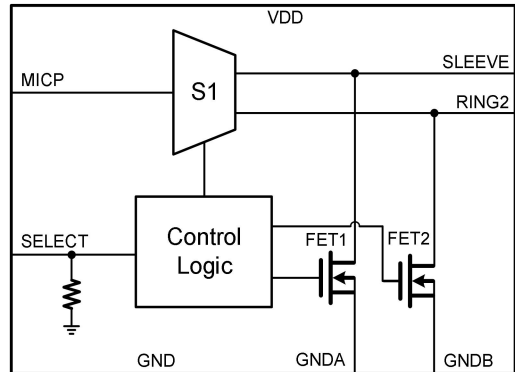


GT4798

Audio Headset Analog Switch with Reduced GND Switch Ron and FM Capability

1 Features	2 Application
- Ground FET Switches Ron: 70mΩ (TYP) - High Isolation Microphone Line Switches - Supports FM Signal Transmission - Reduction of Click-Pop Noise - Power Supply Voltage Range: 2.6V to 5.5V - Total Harmonic Distortion(MIC): 0.01%(TYP) - Low Current Consumption: 2μA(TYP) - Operation temperature range: -40°C to 85°C	- Mobile Phones - Tablet PCs - Notebook/Ultrabook Computers

3 Description	Circuit Diagram
The GT4798 is an audio headset analog switch that is used to detect 3.5mm accessories and switch SLEEVE and RING2 by external controller. The ground signal is routed through a pair of low-impedance ground FETs (70mΩ TYP), resulting minimal impact on audio crosstalk performance. The ground FETs of the device are designed to allow FM signal pass-through, making it possible to use the ground line of the headset as an FM antenna in mobile audio application. The GT4798 operates over an ambient temperature range of -40°C to +85°C.	 The circuit diagram shows the internal structure of the GT4798. It includes a microphone input (MICP) connected to a switch (S1). The switch is controlled by a 'Control Logic' block, which is also connected to a 'SELECT' input and a pull-up resistor to VDD. The switch (S1) has two outputs: one connected to SLEEVE and another connected to RING2. Both outputs are connected to ground through two FETs, FET1 and FET2. The gates of FET1 and FET2 are connected to the 'Control Logic' block. The sources of FET1 and FET2 are connected to GND, GND A, and GND B respectively. The drain of FET1 is connected to SLEEVE, and the drain of FET2 is connected to RING2. The power supply VDD is connected to the top of the switch (S1) and the pull-up resistor.

4 Device Summary, Pin and Packages

Table 4-1. Device Summary⁽¹⁾

Serial Name	Part Name	Package	Body Size (Nom)	Marking ⁽²⁾⁽⁴⁾	MSL ⁽³⁾	Package Qty
GT4798	GT4798WB9	WLCSP-9		4798 XXXX	3	Tape and Reel,3000

(1) For all available packages, please contact product.

(2) There may be additional marking, which relates to the lot trace code information (data code and vendor code), the logo or the environmental category on the device.

(3) MSL, The Moisture Sensitivity Level rating according to the JEDEC industry standard classifications.

(4) "XXXXX" in Marking will be appeared as the batch code.

4 Device Summary, Pin and Packages(Continued)

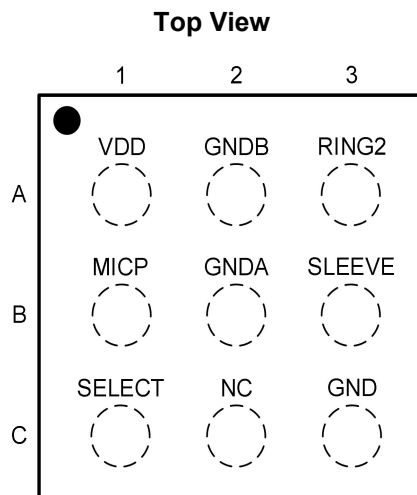


Fig.4-1. GT4798: WLCSP (WLCSP-9) Package

Table 4-2. Pin definition

Pin	Name	I/O	Description
A1	V _{DD}	-	Supply Voltage.
A2	GNDB	-	FET2 Ground Reference.
A3	RING2	I/O	This pin will be routed to MICP or GNDB depending on the SELECT pin.
B1	MICP	I/O	Microphone signal connection to Codec.
B2	GNDA	-	FE1 Ground Reference.
B3	SLEEVE	I/O	This pin will be routed to MICP or GNDA depending on the SELECT pin.
C1	SELECT	I	The logic signal used to control S1 switch, FET1 and FET2.
C2	NC	-	No connection.
C3	GND	-	Ground.

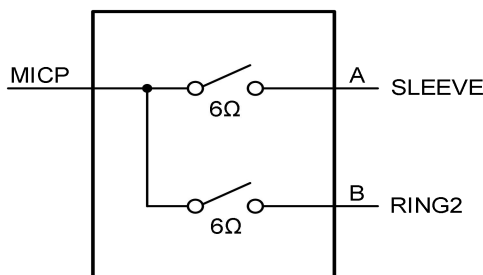


Fig.4-2. Audio Switch S1 MUX Detail

Table 4-3. Function Table

SELECT	Function
0	MICP = A = SLEEVE, FET2 turn on, FET1 turn off.
1	MICP = B = RING2, FET2 turn off, FET1 turn on.

5 Voltage, Temperature, ESD and Thermal Ratings

5.1 Absolute Maximum Ratings⁽¹⁾

Parameters		Min.	Max.	Unit
V ₊	Supply voltage range	-0.3	6.0	V
V _{IN}	Analog, digital voltage range ⁽²⁾	-0.3	(V ₊)+0.3	V
T _J	Junction temperature under bias	-65	150	°C
T _{stg}	Storage temperature range	-65	150	°C

(1) Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated under "Recommended Operating Conditions" is not implied. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.

(2) The input and output negative-voltage ratings may be exceeded if the input and output current ratings are observed.

5.2 ESD Ratings

ESD			Value	Unit
V(ESD)	Electrostatic discharge	Human-Body Model (HBM) ⁽¹⁾	8 K	V
		Charged-Device Model (CDM) ⁽²⁾	2 K	V

(1) JEDEC document JEP155 states that 500-V HBM allows safe manufacturing with a standard ESD control process.

(2) JEDEC document JEP157 states that 250-V CDM allows safe manufacturing with a standard ESD control process.

5.3 Recommended Operating Conditions⁽¹⁾

Over operating free-air temperature range (unless otherwise noted)

Symbol	Parameter	Min	Max	Units
V ₊	Supply voltage	2.6	5.0	V
T _A	Ambient temperature	-40	85	°C

(1) All unused digital inputs of the device must be held at V_{CC} or GND to ensure proper device operation.

6 Electrical Specifications

$V_+ = 2.6V$ to $5.0V$, Full = $-40^{\circ}C$ to $+85^{\circ}C$, typical values are at $V_+ = 3.3V$, $T_A = +25^{\circ}C$ (unless otherwise noted)

Parameter	Symbol	Conditions	Temp	Min	Typ	Max	Units
Power Voltage Range	V ₊		+25°C	2.6		5.0	V
Quiescent Current	I _Q	V ₊ = 4.5V, V _{MICP} = 1.8V to V ₊ , SELECT = Low or High	+25°C		2	5	μA
Input/Output Voltage Range	V _{IO}	V ₊ ≤ 3.3V	+25°C	0		V ₊	V
		V ₊ ≥ 3.3V	+25°C	0		3.3	
Input Logic High for SELECT	V _{IH}	V ₊ = 2.6V	Full	1.3		V ₊	V
		V ₊ = 3.3V	Full	1.4		V ₊	
		V ₊ = 4.5V	Full	1.5		V ₊	
Input Logic Low for SELECT	V _{IL}	V ₊ = 2.6V	Full	0		0.3	V
		V ₊ = 3.3V	Full	0		0.4	
		V ₊ = 4.5V	Full	0		0.5	
Pull Down Resistor of SELECT pin	R _{PD}		+25°C		600		kΩ
Switch Resistance							
FET1 On Resistance	R _{F1}	V ₊ = 2.6V, V _{GND} = 0V, I _{GND} = 10mA	+25°C		70	105	mΩ
FET2 On Resistance	R _{F2}		+25°C		70	105	
S1 On Resistance (Closed to A)	R _{S1A}	V ₊ = 2.6V, V _{SLEEVE/RING2} = 0V to 2.6V, I _{MIC} = ±10mA	+25°C		5	7.5	Ω
S1 On Resistance (Closed to B)	R _{S1B}		+25°C		5	7.5	
Switch Leakage Current							
FET1, FET2 off Leakage Current	I _{FET(OFF)}	V ₊ = 5.5V, V _{IN} = 0V to 3.3V, V _{OUT} = 0V, SELECT = 0 to 5.5V	+25°C			1	μA
S1A, S1B Off Leakage Current	I _{S1AB(OFF)}		+25°C			1	
S1A, S1B On Leakage Current	I _{S1AB(ON)}		+25°C			1	
Switch Dynamic Characteristics							
FET1 Bandwidth	BW _{F1}	R _L =50Ω, C _L =5pF	+25°C		100		MHz
FET2 Bandwidth	BW _{F2}	V _G =0, R _G =0, C _L =1nF	+25°C		100		
Power Supply Rejection	PSRR	V ₊ = 2.6V, V _{AC} = 200mV _{PP} , V _{DC} = 0V, f = 217Hz, R _S = R _L = 600Ω	+25°C		100		dB
		V ₊ = 2.6V, V _{AC} = 200mV _{PP} , V _{DC} = 0V, f = 1kHz, R _S = R _L = 600Ω	+25°C		90		
		V ₊ = 2.6V, V _{AC} = 200mV _{PP} , V _{DC} = 0V, f = 20kHz, R _S = R _L = 600Ω	+25°C		65		
		V ₊ = 5V, V _{AC} = 200mV _{PP} , V _{DC} = 0V, f = 217Hz, R _S = R _L = 600Ω	+25°C		100		
		V ₊ = 5V, V _{AC} = 200mV _{PP} , V _{DC} = 0V, f = 1kHz, R _S = R _L = 600Ω	+25°C		95		
		V ₊ = 5V, V _{AC} = 200mV _{PP} , V _{DC} = 0V, f = 20kHz, R _S = R _L = 600Ω	+25°C		70		
SLEEVE or RING2 to MICP isolation	ISO _{S1}	V = 200mV _{PP} , f = 20kHz, R _L = 50Ω	+25°C		-110		dB
SLEEVE to RING2 Separation	SEP _{S1}	V = 200mV _{PP} , f = 20kHz, R _L = 50Ω	+25°C		-110		
Total Harmonic Distortion	THD	V = 200mV _{PP} , f = 20-20kHz, R _S = 50Ω, BW = 80kHz	+25°C		0.01		%
Dynamic Characteristics							
Turn-on Time	t _{ON}		+25°C		105		ns
Turn-off Time	t _{OFF}		+25°C		50		
Break-Before-Make Time Delay	t _D		+25°C		15		

7 Typical Characteristics

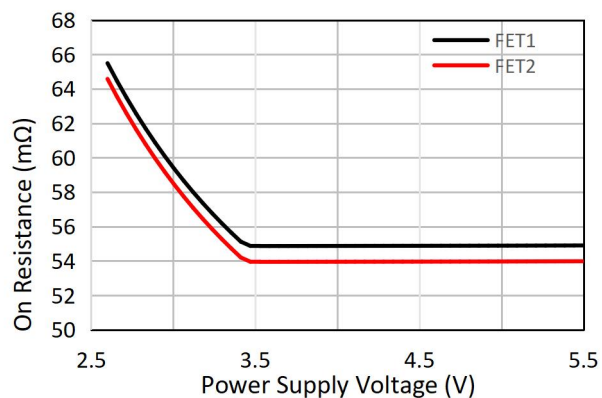
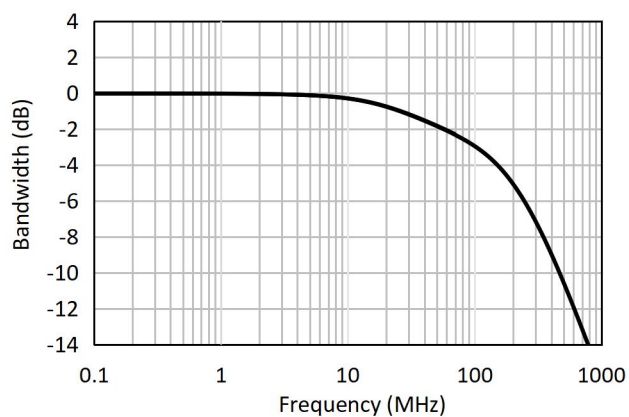


Fig.7-1. On Resistance vs Power Supply Voltage



g.7-2. Bandwidth vs Frequency

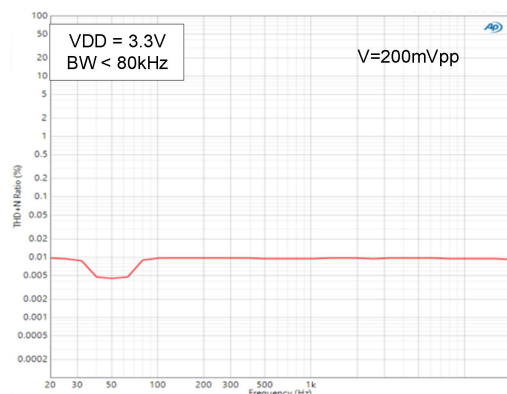


Fig.7-3. THD+N vs. Frequency (SLEEVE)

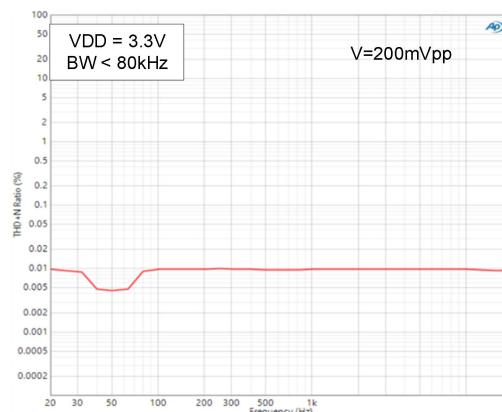
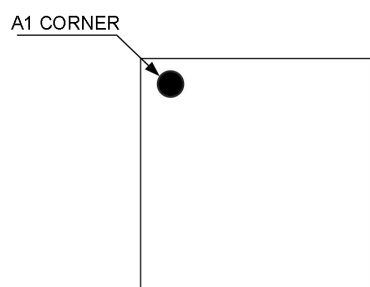


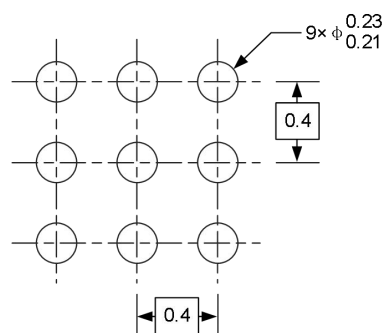
Fig.7-4. THD+N vs. Frequency (RING2)

8 Package Outline Dimension

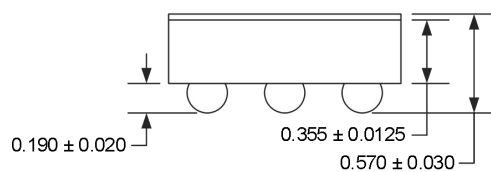
WLCSP-9



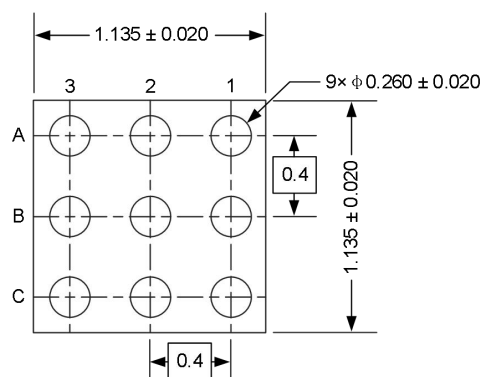
TOP VIEW



RECOMMENDED PATTERN

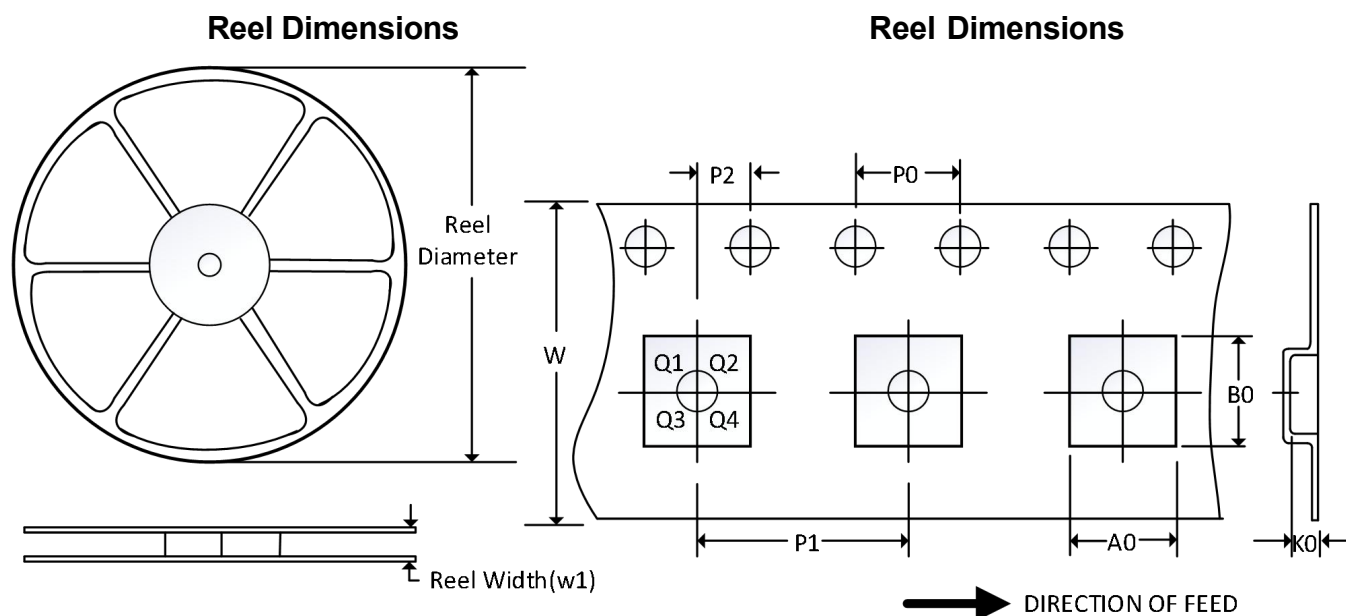


SIDE VIEW



BOTTOM VIEW

9 Tape and Reel Information



NOTE: The picture is only for reference. Please make the object as the standard.

Key Parameter List of Tape and Reel

Package Type	Reel Diameter	Reel Width(m m)	A0 (mm)	B0 (mm)	K0 (mm)	P0 (mm)	P1 (mm)	P2 (mm)	W (mm)	Pin1 Quadrant
WLCSP-9	7"	9.5	1.27	1.27	0.67	4	4	2	8	Q1

NOTE:

1. All dimensions are nominal.
2. Plastic or metal protrusions of 0.15mm maximum per side are not included.