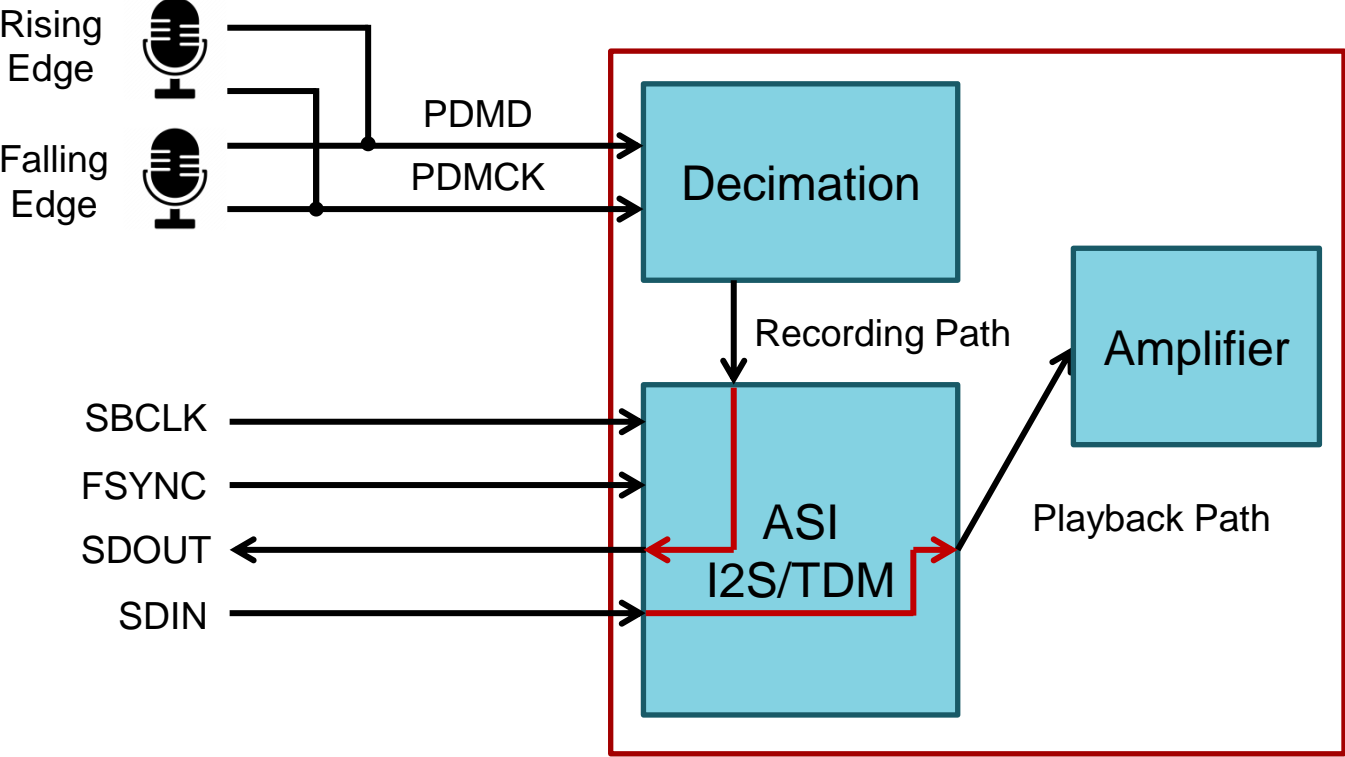


TAS2563 PDM

Applications Engineering – Low Power Audio & Actuators

Block Diagram



Configuration and Processing

- PDMCK is derived from SBCLK
- PDMCK can be configured:
 - 3.072MHz or 6.144MHz
 - Master or Slave (Output or Input)
- PDMD can be configured:
 - Mic1 and Mic2 paths can be assigned to rising or falling edge of PDMCK
 - Mic1 and Mic2 paths can be enabled/disabled individually
- -110dB to 30dB gain available for PDM Mic data
- Default SDOOUT data is:
 - Mic1 on slot 0
 - Mic2 on slot 1
 - Echo Reference on slot 2

ASI Record Channel selection:

- Audio In & Audio Out
- Temperature & Excursion
- PDM Mic & Echo Reference
- I Sense & V Sense

PDM Clock Diagram

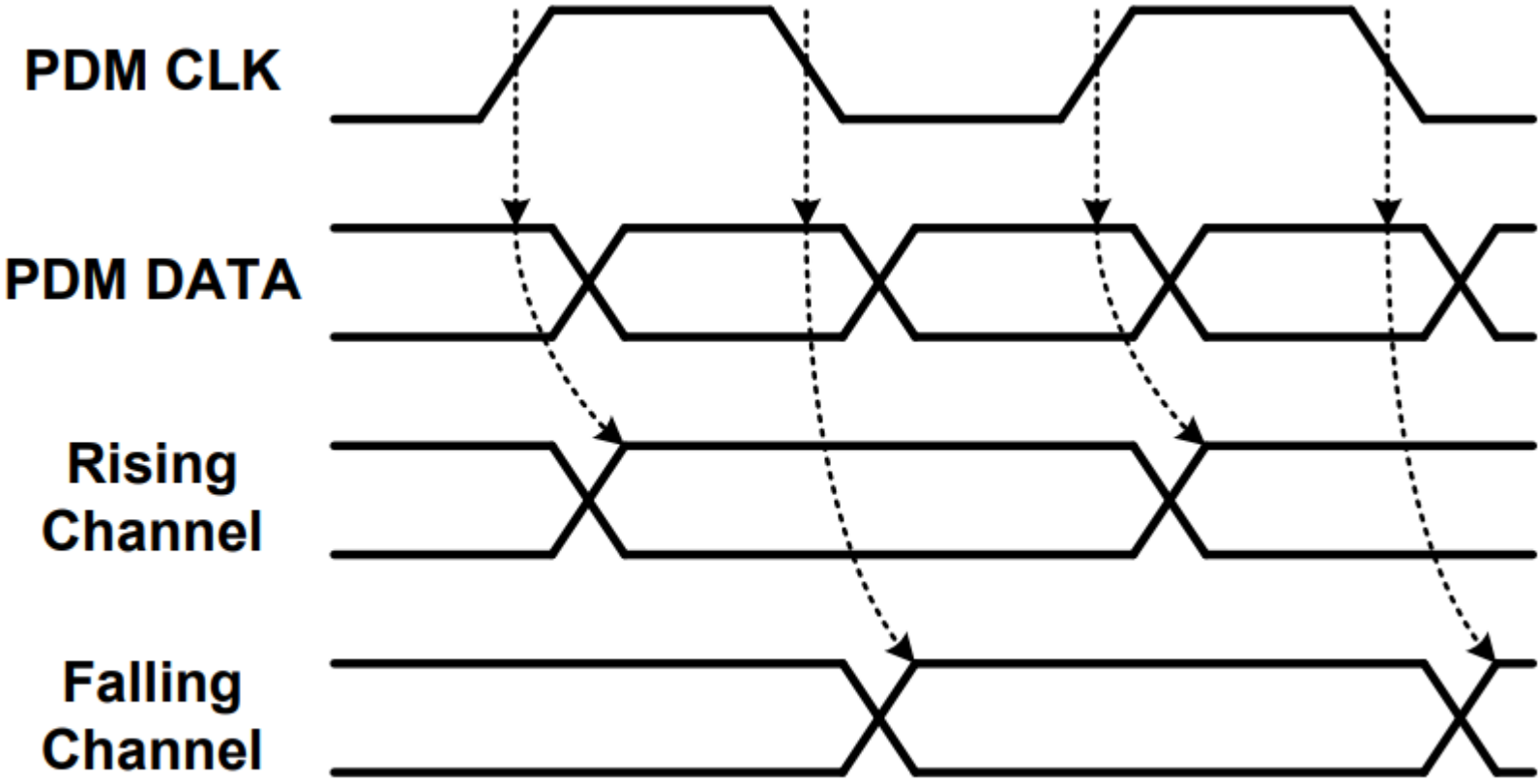


Figure 58. PDM Waveform

PDM Configuration Registers – B0 P0

65	PDM_CONFIG0												
		7								RSVD	1'b0	R	Reserved
		6								PDM_GATE_PAD0	1'b1	RW	Clock gating for master mode PAD0 0b = Disabled 1b = Enabled
			5							PDM_RATE_PAD0	1'b0	RW	PDM data rate for PAD0 0b=3.072MHz 1b=6.144MHz
				4						DIS_PDM_MIC_CLK_ERR_PAD0	1'b0	RW	Disable PDM mic clock error on PAD0 detection 0b=Clock error detection is enabled 1b=Clock error detection is disabled
					3					PDM_PAD0_CAP_EDGE	1'b0	RW	Capture edge of PDM mic data for PAD0 0b=mic1 captured on posedge. Mic2 captured on negedge 1b=mic1 captured on negedge. Mic2 captured on posedge
						2				PDM_MIC2_EN	1'b0	RW	Control for PDM MIC2 path 0b=Disable the MIC2 path 1b=Enable the MIC2 path
							1			PDM_MIC1_EN	1'b0	RW	Enable the PDM MIC1 path 0b=Disable the MIC1 path 1b=Enable the MIC1 path
								0		PDM_MIC_SLV	1'b1	RW	device in PDM MIC SLAVE or MASTER 0b=Device is in PDM MIC master mode 1b=Device is in PDM Slave mode

PDM Configuration Registers – B0 P0

66	DIN_PD & PDM_CONFIG3												
		7								DIN_PD[14]	1'b0	RW	Weak pull down for SDIN2 0b = Disabled 1b = Enabled
		6								DIN_PD[13]	1'b0	RW	Weak pull down for SDOUT2 0b = Disabled 1b = Enabled
			5							RSVD	1'b0	R	Reserved
				4						wk_pulldown_pdmd_pad0	1'b0	RW	control for pulldown of pdmd_pad0 0b=Disable the pulldown control 1b=Enable the pulldown control
					3					wk_pulldown_pdmck_pad0	1'b0	RW	control for pulldown of pdmck_pad0 0b=Disable the pulldown control 1b=Enable the pulldown control
						2	1	0		RSVD	3'b000	R	Reserved

PDM Configuration Script

- w 98 00 00 # Go to page 0
- w 98 7F 00 # Go to book 0
- w 98 00 00 # Go to page 0
- # Disable PDMCK Gating for Master Mode
- # PDM data rate = 3.072MHz
- # Mic1 positive edge, Mic2 negative edge
- # Enable Mic1 and Mic2 path
- # PDM Master Mode
- w 98 41 06
- w 98 42 18

Hardware Setup

Device Under Test

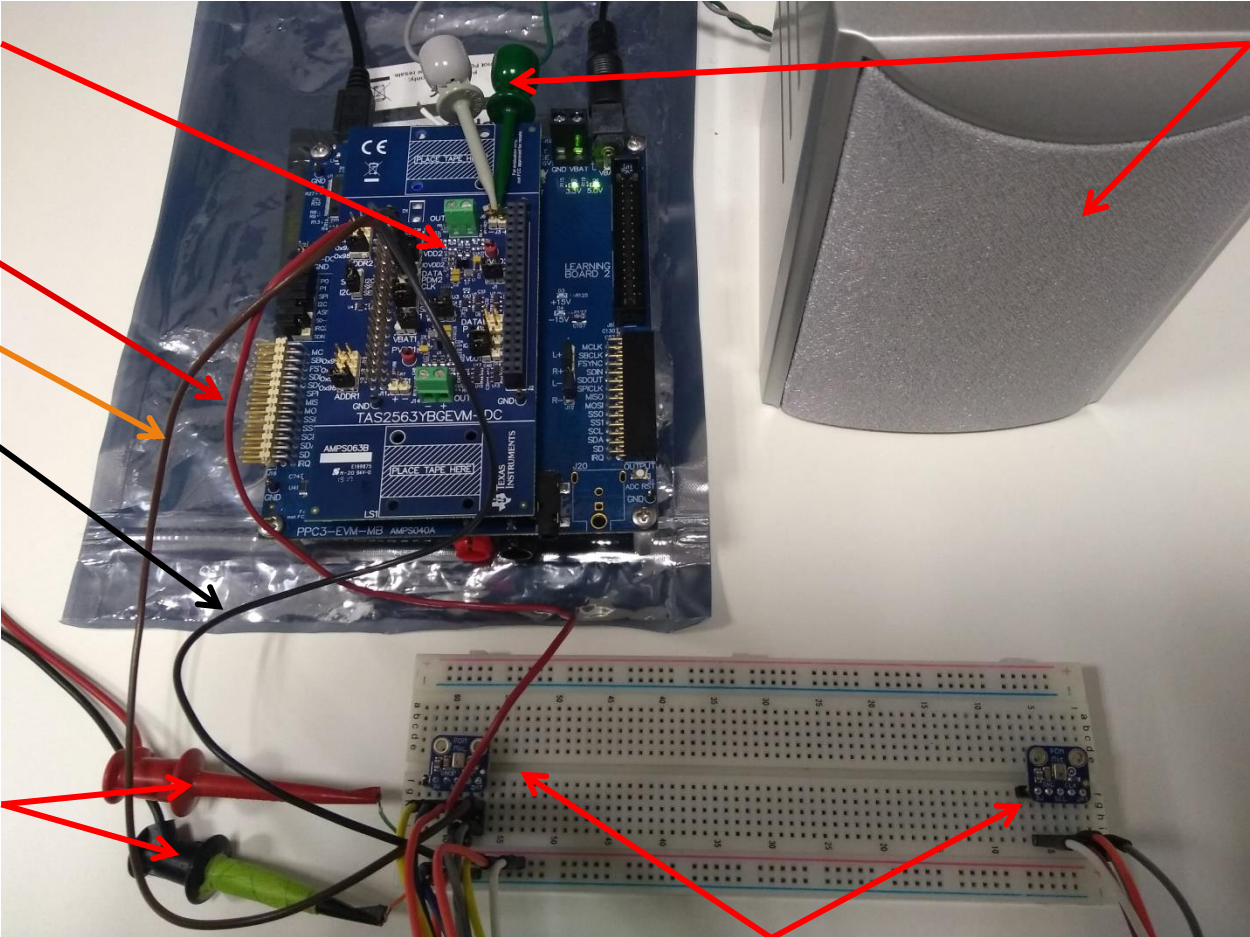
Speaker

PDMCK

PDMD

GND

3V source
for DMICs

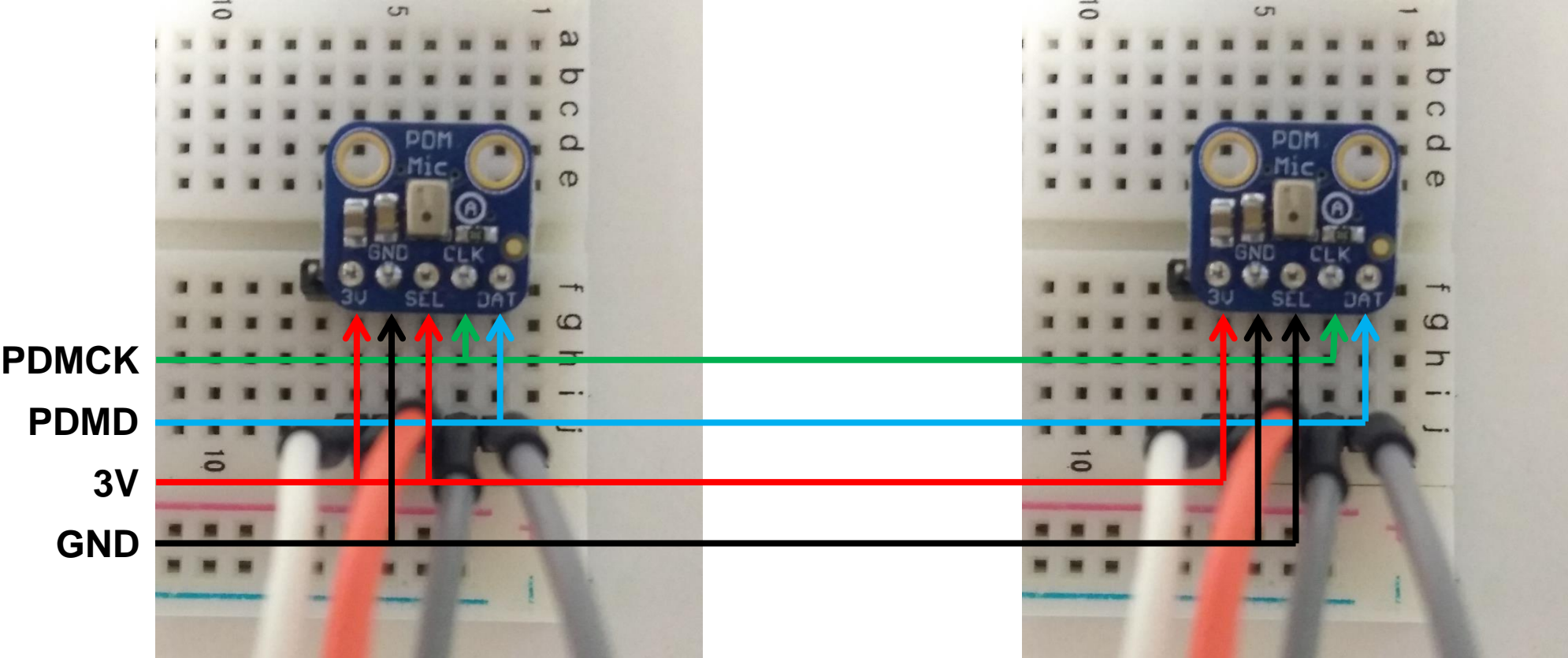


Digital Microphones

Digital Microphone Connections

MIC1

MIC2



PPC3

PurePath™ Console -TAS2563 EVM

Tuning Snapshots Audio Player

App Center > TAS2563 EVM Home > Audio processing > Smart Amp

Equalizer

Magnitude

Speaker Target Compensation

Phase

Group Delay

Step-Impulse

Excursion

Thermal Protection Tuning

Characterization Data

Warning: You are using the default data!

Speaker Type : closed

Re : 6.70 Ohm

Flex Cable Re : 0.0 Ohm

Fs : 891 Hz

	Low	Mid	High
Enable Output	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Frequency (Hz)	150	800	5000
Thermal Priority	8	2	1
Thermal Speed (ms)	100	100	30
Excursion Priority	0.7	0.6	0.2
Excursion Speed (ms)	100	100	30

High Pass Filter

Corner Frequency: 150.00 Hz

Align Type: Cheby 0.25dB

Align Order: 2 4

Ch2 Vol (dB): 0

Ch1 Vol (dB): 0

PDM Mic Gain is set from
Tuning and Audio
Processing -> SmartAmp
settings

PPC3

The screenshot shows the 'PurePath™ Console - TAS2563 EVM' interface. The breadcrumb trail is 'App Center > TAS2563 EVM Home > End System Integration'. The main navigation bar has 'Select Your Option' and 'Dump Binary File'. The 'Snapshot Selection' dialog is open, displaying the following content:

Snapshot Selection

Choose the snapshot with which the binary file s

1. Tuning Mode, 48 KHz, Auto

1

Base snapshot: Snapshot 1

We will be creating a configuration settings (Dump Definition) with .ppc3 file to enable you to tune in device later.

Choose an appropriate name for the DDC settings for which

Enter DDC Name:

Choose path to save generated binary files

No Folder Selected

Buttons: Prev, Next

Bottom status bar: TAS2563 EVM - offline, I²C, V, TEXAS INSTRUMENTS

ASI Record Channel selection:

- Audio In & Audio Out
- Temperature & Excursion
- PDM Mic & Echo Reference
- I Sense & V Sense

PDM Mic data selected at End System Integration panel

Modify SDOUT Data Slots

- SDOUT data arrangement can be modified by using register 0x0b, 0x0c and 0x0d
- Register 0x0b controls data from mic2
 - LSBits select the slot, based on 8-bit counting:
 - w 98 0b 44 enables mic2 data and selects slot1 for 32-bit slot length
 - w 98 0b 42 enables mic2 data and selects slot1 for 16-bit slot length
 - w 98 0b 40 enables mic2 data and selects slot0 for 32-bit or 16-bit slot length
- Register 0x0c controls data from mic1
 - LSBits select the slot, based on 8-bit counting:
 - w 98 0c 44 enables mic1 data and selects slot1 for 32-bit slot length
 - w 98 0c 42 enables mic1 data and selects slot1 for 16-bit slot length
 - w 98 0c 40 enables mic1 data and selects slot0 for 32-bit or 16-bit slot length