MT6358 Power Management IC
Product Brief

Version: **1.0**
Release date: **2023-09-18**

The full datasheet is available with an NDA

Use of this document and any information contained therein is subject to the terms and conditions set forth in Exhibit 1. This document is subject to change without notice.

MediaTek Proprietary and Confidential. © 2023 MediaTek Inc. All rights reserved.
Unauthorized reproduction or disclosure of this document, in whole or in part, is strictly prohibited.

Version History

Version	Date	Description
1.0	2023-09-18	Official release

MediaTek Proprietary and Confidential. © 2023 MediaTek Inc. All rights reserved. Unauthorized reproduction or disclosure of this document, in whole or in part, is strictly prohibited.

Table of Contents

List of Figures

List of Tables

MediaTek Proprietary and Confidential. © 2023 MediaTek Inc. All rights reserved. Unauthorized reproduction or disclosure of this document, in whole or in part, is strictly prohibited.

1 Overview

1.1 Features

- Handles all IoT devices baseband power management
- Input range: 2.6V ~ 5V
- 9 buck converters and 33 LDOs optimized for specific IoT device subsystems
- Full-set high-quality audio feature: Supports uplink/downlink audio CODEC.
- 32K-Crystal-less RTC oscillator for system timing, 1.8 and 2.8V clock buffer output
- SPI interface
- Over-current and thermal overload protection
- Programmable under voltage lockout protection
- Watchdog reset
- Flexibility hardware PMIC reset function
- Power-on reset and start-up timer
- Precision voltage, temperature, and current measurement fuel gauge
- Storage card plug-out protection
- 194-pin MIFO WLCSP package

1.2 Applications

MT6358 is ideal for power management of 2G, 3G and 4G smart phones, other portable systems, Industrial HMI, desktop POS, KIOSK and digital signage.

1.3 General Descriptions

MT6358 is a power management system chip optimized for IoT devices, containing 9 buck converters and 33 LDOs optimized for specific IoT device subsystems.

Sophisticated controls are available for power-up and the RTC alarm. MT6358 is optimized for maximum battery life, allowing the RTC circuit to stay alive without a battery for several hours.

MT6358 adopts SPI interface and two SRCLKEN control pins to control buck converters, LDOs, and various drivers; it provides enhanced safety control and protocol for handshaking with baseband.

MT6358 is available in a 194-pin MIFO WLCSP package. The operating temperature ranges from -30 to +85°C.

MediaTek Proprietary and Confidential. © 2023 MediaTek Inc. All rights reserved. Unauthorized reproduction or disclosure of this document, in whole or in part, is strictly prohibited.

1.4 Ordering Information

Table 1-1. Ordering information

Order #	Marking	Temp. range	Package
MT6358W/A		-30 ~ +85°C	MIFO WLCSP 194L

1.5 Pin Assignments and Descriptions

194	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
A	NC	VS1	GND_VS1	VPA	VSYS_VPA	VSYS_VPROC11	VPROC11	GND_VPROC11	VPROC12	VSYS_VPROC12	VSYS_VGPU	VGPU	GND_VCORE	VCORE	VSYS_VCORE	NC	A
B	VSYS_VS1	VS1	GND_VS1	GND_VPA		VSYS_VPROC11	VPROC11	GND_VPROC11	VPROC12	VSYS_VPROC12	VSYS_VGPU	VGPU	GND_VCORE	VCORE	VSYS_VCORE	GND_VCORE_FB	B
C	VSYS_VS1														GND_VGPU_FB	VCORE_FB	C
D		PWRKEY	EXT_PMIC_EN1	RESETB	VPA_FB	VPROC11_FB	GND_VPROC11_FB	GND_VPROC12	GND_VPROC12	GND_VPROC12_FB	VDRAM1_FB	GND_VGPU	GND_VGPU	VGPU_FB	VMODEM_FB	VS2_FB	D
E	GND_SMPS	VSYS_SMPS	VEFUSE	VS1_LDO1	EXT_PMIC_EN2	VCAMIO	VS1_FB	PMU_TESTMODE	VPROC12_FB			GND_VDRAM1_FB		GND_VMODEM_FB			E
F	AU_V18N	FLYN	VIO18		VRF18	VCN18	D_GND	D_GND	D_GND	RTC32K_1V8_0	SPI_CLK	WDTRSTB_IN	SPI_CSN	VSYS_VMODEM	VMODEM	VMODEM	F
G		FLYP		AU_HPR	AU_LOLP	AU_LOLN	D_GND	D_GND	D_GND	SPI_MISO	SPI_MOSI	RTC32K_1V8_1	HOMEKEY		GND_VMODEM	GND_VMODEM	G
H	AVSS18_AUD	AVDD18_AUD		AU_HPL	AU_REFN	AU_HSN	D_GND	D_GND	D_GND	AUD_CLK_MISO	AUD_DAT_MISO1		SCP_VREQ_VA		GND_VDRAM1		H
J			AVDD28_AUD	HP_EINT	AVSS28_AUD	AU_HSP	SRCLKEN_IN1	DVDD18_DIG	AUD_DAT_MOSI0	AUD_SYNC_MISO	AUD_DAT_MISO0		SD_CARD_DET_N		VDRAM1	VSYS_VDRAM1	J
K	AU_VIN0_P		AU_VIN2_N	AU_VIN2_P	AU_MICBIAS0	ACCDET				AUD_SYNC_MOSI		VCDT	CHRLDO		VSYS_VS2	VSYS_VS2	K
L	AU_VIN0_N		AU_VIN1_N	AU_VIN1_P	AU_MICBIAS1	FSOURCE	SRCLKEN_IN0	DVSS18_IO	DVDD18_IO	AUD_DAT_MOSI1	AUD_CLK_MOSI	BATON	BATADC	GND_VS2	VS2	VS2	L
M		AUXADC_VIN	AVDD18_AUXADC	AVSS18_AUXADC	CS_N	VAUX18	RTC32K_2V8	VRTC28	VBIF28	VCAMA1	VSYSSNS	VREF	UVLO_VTH	VS2_LDO4	VCAMD		M
N	XTAL1	AVSS22_XO_ISO		XO_NFC		CS_P	VSIM1	VUSB	VIO28	VCAMA2	VSYS_LDO3	VCN33	GND_VREF	VS2_LDO2	VRF12	VA12	N
P	XTAL2	AVSS22_XO	XO_WCN	XO_SOC	XO_EXT	VXO22	VSYS_LDO1	VLDO28	VSYS_LDO2	VSIM2	VIBR	VSRAM_PROC11	VS2_LDO3	VSRAM_OTHERS	VDRAM2	VRF12_S	P
R	NC	AVSS22_XOBUF	XO_CEL		VAUD28	VCN28	VFE28		VMC	VMCH	VEMC		VSRAM_PROC12	VSRAM_GPU	VS2_LDO1	NC	R
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	

Figure 1-1. MT6358 FOCSP 194 (6.4x6 mm) pin assignment (top view)

Table 1-2. MT6358 pin descriptions

Ball	Symbol	I/O	Description
P1	XTAL2	I/O	XTAL input 2
N1	XTAL1	I/O	XTAL input 1
P3	XO_WCN	O	26MHz output to Conn. RF
P4	XO_SOC	O	26MHz output to SOC
N4	XO_NFC	O	26MHz output to NFC
P5	XO_EXT	O	26MHz output to UFS

MediaTek Proprietary and Confidential. © 2023 MediaTek Inc. All rights reserved. Unauthorized reproduction or disclosure of this document, in whole or in part, is strictly prohibited.

Ball	Symbol	I/O	Description
R3	XO_CEL	O	26MHz output to Cell. RF
F12	WDTRSTB_IN	I	Watchdog reset from AP
P6	VXO22	O	VXO22 output voltage
N8	VUSB	O	VUSB output voltage
M11	VSYSSNS	I	VSYS supply input for internal block and UVLO detection
K15, K16	VSYS_VS2	PWR	Power supply of VS2
B1, C1	VSYS_VS1	PWR	Power supply of VS1
A10, B10	VSYS_VPROC12	PWR	Power supply of VPROC12
A6, B6	VSYS_VPROC11	PWR	Power supply of VPROC11
A5	VSYS_VPA	PWR	Power supply of VPA
F14	VSYS_VMODEM	PWR	Power supply of VMODEM
A11, B11	VSYS_VGPU	PWR	Power supply of VGPU
J16	VSYS_VDRAM1	PWR	Power supply of VDRAM1
A15, B15	VSYS_VCORE	PWR	Power supply of VCORE
E2	VSYS_SMPS	PWR	Power supply of buck controller
N11	VSYS_LDO3	PWR	Power supply input of LDO group 3
P9	VSYS_LDO2	PWR	Power supply input of LDO group 2
P7	VSYS_LDO1	PWR	Power supply input of LDO group 1
R13	VSRAM_PROC12	O	VSRAM_PROC12 output voltage
P12	VSRAM_PROC11	O	VSRAM_PROC11 output voltage
P14	VSRAM_OTHERS	O	VSRAM_OTHERS output voltage
R14	VSRAM_GPU	O	VSRAM_GPU output voltage
P10	VSIM2	O	VSIM2 output voltage
N7	VSIM1	O	VSIM1 output voltage
M14	VS2_LDO4	PWR	1.125V power supply of SLDO4
P13	VS2_LDO3	PWR	1.35V power supply of SLDO3
N14	VS2_LDO2	PWR	1.35V power supply of SLDO2
R15	VS2_LDO1	PWR	1.125V power supply of SLDO1
D16	VS2_FB	I	BUCK VS2 feedback pin
L15, L16	VS2	O	SW node of VS2
E4	VS1_LDO1	PWR	2V power supply of SLDO1
E7	VS1_FB	I	BUCK VS1 feedback pin
A2, B2	VS1	O	SW node of VS1
M8	VRTC28	O	RTC LDO output. Supply of RTC macro where backup battery can be added.
F5	VRF18	O	VRF18 output voltage
P16	VRF12_S	I	LDO VRF12_S feedback pin
N15	VRF12	O	VRF12 output voltage
M12	VREF	O	Bandgap reference voltage
E9	VPROC12_FB	I	BUCK VPROC12 feedback pin on Vout
A9, B9	VPROC12	O	SW node of VPROC12
D6	VPROC11_FB	I	BUCK VPROC11 feedback pin on Vout
A7, B7	VPROC11	O	SW node of VPROC11
D5	VPA_FB	I	BUCK VPA feedback pin on Vout
A4	VPA	O	SW node of VPA
D15	VMODEM_FB	I	BUCK VMODEM feedback pin on Vout
F15, F16	VMODEM	O	SW node of VMODEM
R10	VMCH	O	VMCH output voltage

MediaTek Proprietary and Confidential. © 2023 MediaTek Inc. All rights reserved. Unauthorized reproduction or disclosure of this document, in whole or in part, is strictly prohibited.

Ball	Symbol	I/O	Description
R9	VMC	O	VMC output voltage
P8	VLDO28	O	VLDO28 output voltage
N9	VIO28	O	VIO28 output voltage
F3	VIO18	O	VIO18 output voltage
P11	VIBR	O	VIBR output voltage
D14	VGPU_FB	I	BUCK VGPU feedback pin on Vout
A12, B12	VGPU	O	SW node of VGPU
R7	VFE28	O	VFE28 output voltage
R11	VEMC	O	VEMC33 output voltage
E3	VEFUSE	O	VEFUSE output voltage
P15	VDRAM2	O	VDRAM2 output voltage
D11	VDRAM1_FB	I	BUCK VDRAM1 feedback pin on Vout
J15	VDRAM1	O	SW node of VDRAM1
C16	VCORE_FB	I	BUCK VCORE feedback pin on Vout
A14, B14	VCORE	O	SW node of VCORE
N12	VCN33	O	VCN33 output voltage
R6	VCN28	O	VCN28 output voltage
F6	VCN18	O	VCN18 output voltage
K12	VCDT	I	Fractional charger input voltage for charger detection
E6	VCAMIO	O	VCAMIO output voltage
M15	VCAMD	O	VCAMD output voltage
N10	VCAMA2	O	VCAMA2 output voltage
M10	VCAMA1	O	VCAMA1 output voltage
M9	VBIF28	O	VBIF28 output voltage
M6	VAUX18	O	VAUX18 output voltage
R5	VAUD28	O	VAUD28 output voltage
N16	VA12	O	VA12 output voltage
M13	UVLO_VTH	I	UVLO threshold control pin
J7	SRCLKEN_IN1	I	Source clock enable pin 1
L7	SRCLKEN_IN0	I	Source clock enable pin 0
G11	SPI_MOSI	I/O	SPI control interface
G10	SPI_MISO	I/O	SPI control interface
F13	SPI_CSN	I/O	SPI control interface
F11	SPI_CLK	I	SPI control interface
J13	SD_CARD_DET_N	I	Voltage source request input pin, connected to SD CARD
H13	SCP_VREQ_VAO	I	Voltage source request input pin, connected to SOC
M7	RTC32K_2V8	O	VRTC domain 32kHz clock output
G12	RTC32K_1V8_1	O	VIO18 domain 32kHz clock output
F10	RTC32K_1V8_0	O	VIO18 domain 32kHz clock output
D4	RESETB	O	System reset release signal
D2	PWRKEY	I	PWRKEY button
E8	PMU_TESTMODE	I	PMU test mode signal (tied to GND in normal operation)
A1, A16, R1, R16	NC	NC	NC
J4	HP_EINT	I	HPL detection
G13	HOMEKEY	I	HOMEKEY button

MediaTek Proprietary and Confidential. © 2023 MediaTek Inc. All rights reserved. Unauthorized reproduction or disclosure of this document, in whole or in part, is strictly prohibited.

Ball	Symbol	I/O	Description
L14	GND_VS2	GND	VS2 ground
A3, B3	GND_VS1	GND	VS1 ground
N13	GND_VREF	GND	Ground for bandgap
D10	GND_VPROC12_FB	I	Remote sense on ground of VPROC12 Vout
D8, D9	GND_VPROC12	GND	VPROC12 ground
D7	GND_VPROC11_FB	I	Remote sense on ground of VPROC11 Vout
A8, B8	GND_VPROC11	GND	VPROC11 ground
B4	GND_VPA	GND	VPA ground
E14	GND_VMODEM_FB	I	Remote sense on ground of VMODEM Vout
G15, G16	GND_VMODEM	GND	VMODEM ground
C15	GND_VGPU_FB	I	Remote sense on ground of VGPU Vout
D12, D13	GND_VGPU	GND	VGPU ground
E12	GND_VDRAM1_FB	I	Remote sense on ground of VDRAM1 Vout
H15	GND_VDRAM1	GND	VDRAM1 ground
B16	GND_VCORE_FB	I	Remote sense on ground of VCORE
A13, B13	GND_VCORE	GND	VCORE ground
E1	GND_SMPS	GND	GND of buck controller
L6	FSOURCE	PWR	EFUSE power source
G2	FLYP	O	Flying capacitor top
F2	FLYN	O	Flying capacitor bottom
E5	EXT_PMIC_EN2	O	Ext chip enable pin2
D3	EXT_PMIC_EN1	O	Ext chip enable pin1
L8	DVSS18_IO	GND	Digital IO power GND
L9	DVDD18_IO	PWR	Digital IO power
J8	DVDD18_DIG	PWR	VDIG18 output voltage
F7, F8, F9, G7, G8, G9, H7, H8, H9	D_GND	GND	Ground
N6	CS_P	I	Fuel gauge ADC input pin
M5	CS_N	I	Fuel gauge ADC input pin
K13	CHRLDO	O	CHRLDO output voltage
L12	BATON	I	Battery NTC pin for battery and its temperature sensing
L13	BATADC	I	Fuel gauge ADC input pin for monitoring battery voltage
J5	AVSS28_AUD	GND	Audio UL ground
R2	AVSS22_XOBUF	GND	Ground for XO
N2	AVSS22_XO_ISO	GND	Connect to GSUB for DCXO noise isolation
P2	AVSS22_XO	GND	Ground for XO
M4	AVSS18_AUXADC	GND	AUXADC ground
H1	AVSS18_AUD	GND	Audio DL ground
J3	AVDD28_AUD	PWR	Power supply of Audio UL
M3	AVDD18_AUXADC	PWR	1.8V power supply of AUXADC
H2	AVDD18_AUD	PWR	1.8V power supply of audio
M2	AUXADC_VIN	I	AUXADC input
K10	AUD_SYNC_MOSI	I/O	Audio control interface
J10	AUD_SYNC_MISO	I/O	Audio control interface
L10	AUD_DAT_MOSI1	I/O	Audio control interface
J9	AUD_DAT_MOSI0	I/O	Audio control interface
H11	AUD_DAT_MISO1	I/O	Audio control interface

MediaTek Proprietary and Confidential. © 2023 MediaTek Inc. All rights reserved. Unauthorized reproduction or disclosure of this document, in whole or in part, is strictly prohibited.

Ball	Symbol	I/O	Description
J11	AUD_DAT_MISO0	I/O	Audio control interface
L11	AUD_CLK_MOSI	I	Audio control interface
H10	AUD_CLK_MISO	O	Audio control interface
K4	AU_VIN2_P	I	Microphone channel 2 positive input
K3	AU_VIN2_N	I	Microphone channel 2 negative input
L4	AU_VIN1_P	I	Microphone channel 1 positive input
L3	AU_VIN1_N	I	Microphone channel 1 negative input
K1	AU_VIN0_P	I	Microphone channel 0 positive input
L1	AU_VIN0_N	I	Microphone channel 0 negative input
F1	AU_V18N	PWR	Audio -1.8V supply
H5	AU_REFN	GND	Audio reference ground
L5	AU_MICBIAS1	O	Microphone Bias 1
K5	AU_MICBIAS0	O	Microphone Bias 0
G5	AU_LOLP	O	Lineout positive output
G6	AU_LOLN	O	Lineout negative output
J6	AU_HSP	O	Handset positive output
H6	AU_HSN	O	Handset negative output
G4	AU_HPR	O	Earphone right channel output
H4	AU_HPL	O	Earphone left channel output
K6	ACCDET	I	Accessory detection input

MediaTek Proprietary and Confidential. © 2023 MediaTek Inc. All rights reserved. Unauthorized reproduction or disclosure of this document, in whole or in part, is strictly prohibited.

2 Electrical Characteristics

2.1 Absolute Maximum Ratings over Operating Free-Air Temperature Range

Stresses beyond those listed in Table 2-1 may cause permanent damage to the device. These numbers are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect the device reliability.

Table 2-1. Absolute maximum ratings

Parameter	Conditions	Min.	Typical	Max.	Unit
Free-air temperature range		-40		85	°C
Storage temperature range		-65		150	°C
Battery pin input (1)	Steady state	-0.5		6	V
	Transient (< 10 ms)	-0.5		7	V
Non-battery power pin (2)	Steady state	-0.5		5	V
Signal pins (3)	Steady state	-0.5		Vxx+0.5 (3)	V
ESD robustness	HBM	2,000			V
Charger input withstand				30	V

(1) Note 1 VSYS_XXX/Vxxx (BUCK SW node)/VSYSSNS/BATADC -> Battery input pin

(2) Note 2 Non-battery power input -> Reference Table 1-1 (PWR pin but not connected with battery)

(3) Note 3 Vxx = Max. operation voltage (refer to Table 2-2)

2.2 Thermal Characteristic

Table 2-2. Thermal characteristics

Parameter	Conditions	Min.	Typical	Max.	Unit
Thermal resistance from junction to ambient	In free air		36.0		°C/W

Note. The device is mounted on an 8-metal-layer PCB and modeled per JEDEC51-9 condition.

2.3 Pin Voltage Range

The table below lists the operation rang voltages for all MT6358 I/O pins.

Table 2-3. Pin voltage range

Ball	Symbol	Voltage range	Unit
P1	XTAL2	0 ~ 2.2	V
N1	XTAL1	-0.2 ~ 2.2	V
P3	XO_WCN	0 ~ 1.98	V
P4	XO_SOC	0 ~ 1.21	V
N4	XO_NFC	0 ~ 1.21	V
P5	XO_EXT	0 ~ 1.21	V

MediaTek Proprietary and Confidential. © 2023 MediaTek Inc. All rights reserved. Unauthorized reproduction or disclosure of this document, in whole or in part, is strictly prohibited.

Ball	Symbol	Voltage range	Unit
R3	XO_CEL	0 ~ 1.98	V
F12	WDTRSTB_IN	0 ~ 1.98	V
P6	VXO22	0 ~ 2.42	V
N8	VUSB	0 ~ 3.63	V
M11	VSYSSNS	0 ~ 5	V
K15, K16	VSYS_VS2	0 ~ 5	V
B1, C1	VSYS_VS1	0 ~ 5	V
A10, B10	VSYS_VPROC12	0 ~ 5	V
A6, B6	VSYS_VPROC11	0 ~ 5	V
A5	VSYS_VPA	0 ~ 5	V
F14	VSYS_VMODEM	0 ~ 5	V
A11, B11	VSYS_VGPU	0 ~ 5	V
J16	VSYS_VDRAM1	0 ~ 5	V
A15, B15	VSYS_VCORE	0 ~ 5	V
E2	VSYS_SMPS	0 ~ 5	V
N11	VSYS_LDO3	0 ~ 5	V
P9	VSYS_LDO2	0 ~ 5	V
P7	VSYS_LDO1	0 ~ 5	V
R13	VSRAM_PROC12	0 ~ 1.4	V
P12	VSRAM_PROC11	0 ~ 1.4	V
P14	VSRAM_OTHERS	0 ~ 1.4	V
R14	VSRAM_GPU	0 ~ 1.4	V
P10	VSIM2	0 ~ 5	V
N7	VSIM1	0 ~ 5	V
M14	VS2_LDO4	0 ~ 2.2	V
P13	VS2_LDO3	0 ~ 2.2	V
N14	VS2_LDO2	0 ~ 2.2	V
R15	VS2_LDO1	0 ~ 2.2	V
D16	VS2_FB	0 ~ 5	V
L15, L16	VS2	0 ~ 5	V
E4	VS1_LDO1	0 ~ 2.2	V
E7	VS1_FB	0 ~ 5	V
A2, B2	VS1	0 ~ 5	V
M8	VRTC28	0 ~ 2.98	V
F5	VRF18	0 ~ 2.2	V
P16	VRF12_S	0 ~ 1.4	V
N15	VRF12	0 ~ 1.4	V
M12	VREF	0 ~ 1.32	V
E9	VPROC12_FB	0 ~ 5	V
A9, B9	VPROC12	0 ~ 5	V
D6	VPROC11_FB	0 ~ 5	V
A7, B7	VPROC11	0 ~ 5	V
D5	VPA_FB	0 ~ 5	V
A4	VPA	0 ~ 5	V
D15	VMODEM_FB	0 ~ 5	V
F15, F16	VMODEM	0 ~ 5	V
R10	VMCH	0 ~ 5	V
R9	VMC	0 ~ 5	V

MediaTek Proprietary and Confidential. © 2023 MediaTek Inc. All rights reserved. Unauthorized reproduction or disclosure of this document, in whole or in part, is strictly prohibited.

Ball	Symbol	Voltage range	Unit
P8	VLDO28	0 ~ 5	V
N9	VIO28	0 ~ 5	V
F3	VIO18	0 ~ 2.2	V
P11	VIBR	0 ~ 5	V
D14	VGPU_FB	0 ~ 5	V
A12, B12	VGPU	0 ~ 5	V
R7	VFE28	0 ~ 5	V
R11	VEMC	0 ~ 5	V
E3	VEFUSE	0 ~ 2.2	V
P15	VDRAM2	0 ~ 1.4	V
D11	VDRAM1_FB	0 ~ 5	V
J15	VDRAM1	0 ~ 5	V
C16	VCORE_FB	0 ~ 5	V
A14, B14	VCORE	0 ~ 5	V
N12	VCN33	0 ~ 5	V
R6	VCN28	0 ~ 5	V
F6	VCN18	0 ~ 2.2	V
K12	VCDT	0 ~ 2.94	V
E6	VCAMIO	0 ~ 2.2	V
M15	VCAMD	0 ~ 2.2	V
N10	VCAMA2	0 ~ 5	V
M10	VCAMA1	0 ~ 5	V
M9	VBIF28	0 ~ 5	V
M6	VAUX18	0 ~ 2.2	V
R5	VAUD28	0 ~ 5	V
N16	VA12	0 ~ 1.4	V
M13	UVLO_VTH	0 ~ 5	V
J7	SRCLKEN_IN1	0 ~ 1.98	V
L7	SRCLKEN_IN0	0 ~ 1.98	V
G11	SPI_MOSI	0 ~ 1.98	V
G10	SPI_MISO	0 ~ 1.98	V
F13	SPI_CSN	0 ~ 1.98	V
F11	SPI_CLK	0 ~ 1.98	V
J13	SD_CARD_DET_N	0 ~ 1.98	V
H13	SCP_VREQ_VAO	0 ~ 1.98	V
M7	RTC32K_2V8	0 ~ 2.98	V
G12	RTC32K_1V8_1	0 ~ 1.98	V
F10	RTC32K_1V8_0	0 ~ 1.98	V
D4	RESETB	0 ~ 1.98	V
D2	PWRKEY	0 ~ 5	V
E8	PMU_TESTMODE	0 ~ 5	V
A1, A16, R1, R16	NC	0 ~ 5	V
J4	HP_EINT	0 ~ 2.94	V
G13	HOMEKEY	0 ~ 1.98	V
L14	GND_VS2	0	V
A3, B3	GND_VS1	0	V
N13	GND_VREF	0	V
D10	GND_VPROC12_FB	0	V

MediaTek Proprietary and Confidential. © 2023 MediaTek Inc. All rights reserved. Unauthorized reproduction or disclosure of this document, in whole or in part, is strictly prohibited.

Ball	Symbol	Voltage range	Unit
D8, D9	GND_VPROC12	0	V
D7	GND_VPROC11_FB	0	V
A8, B8	GND_VPROC11	0	V
B4	GND_VPA	0	V
E14	GND_VMODEM_FB	0	V
G15, G16	GND_VMODEM	0	V
C15	GND_VGPU_FB	0	V
D12, D13	GND_VGPU	0	V
E12	GND_VDRAM1_FB	0	V
H15	GND_VDRAM1	0	V
B16	GND_VCORE_FB	0	V
A13, B13	GND_VCORE	0	V
E1	GND_SMPS	0	V
L6	FSOURCE	0 ~ 1.98	V
G2	FLYP	0 ~ 1.98	V
F2	FLYN	-1.98 ~ 0	V
E5	EXT_PMIC_EN2	0 ~ 5	V
D3	EXT_PMIC_EN1	0 ~ 5	V
L8	DVSS18_IO	0 ~ 1.98	V
L9	DVDD18_IO	0 ~ 1.98	V
J8	DVDD18_DIG	0 ~ 1.98	V
F7, F8, F9, G7, G8, G9, H7, H8, H9	D_GND	0	V
N6	CS_P	-0.1 ~ 0.1	V
M5	CS_N	-0.1 ~ 0.1	V
K13	CHRLDO	0 ~ 2.94	V
L12	BATON	0 ~ 5	V
L13	BATADC	0 ~ 5	V
J5	AVSS28_AUD	0	V
R2	AVSS22_XOBUF	0	V
N2	AVSS22_XO_ISO	0	V
P2	AVSS22_XO	0	V
M4	AVSS18_AUXADC	0	V
H1	AVSS18_AUD	0	V
J3	AVDD28_AUD	0 ~ 2.94	V
M3	AVDD18_AUXADC	0~1.98	V
H2	AVDD18_AUD	0 ~ 1.98	V
M2	AUXADC_VIN	0 ~ 1.98	V
K10	AUD_SYNC_MOSI	0 ~ 1.98	V
J10	AUD_SYNC_MISO	0 ~ 1.98	V
L10	AUD_DAT_MOSI1	0 ~ 1.98	V
J9	AUD_DAT_MOSI0	0 ~ 1.98	V
H11	AUD_DAT_MISO1	0 ~ 1.98	V
J11	AUD_DAT_MISO0	0 ~ 1.98	V
L11	AUD_CLK_MOSI	0 ~ 1.98	V
H10	AUD_CLK_MISO	0 ~ 1.98	V
K4	AU_VIN2_P	0 ~ 2.94	V
K3	AU_VIN2_N	0 ~ 2.94	V

MediaTek Proprietary and Confidential. © 2023 MediaTek Inc. All rights reserved. Unauthorized reproduction or disclosure of this document, in whole or in part, is strictly prohibited.

Ball	Symbol	Voltage range	Unit
L4	AU_VIN1_P	0 ~ 2.94	V
L3	AU_VIN1_N	0 ~ 2.94	V
K1	AU_VIN0_P	0 ~ 2.94	V
L1	AU_VIN0_N	0 ~ 2.94	V
F1	AU_V18N	-1.98 ~ 0	V
H5	AU_REFN	0	V
L5	AU_MICBIAS1	0 ~ 2.94	V
K5	AU_MICBIAS0	0 ~ 2.94	V
G5	AU_LOLP	-1.98 ~ 1.98	V
G6	AU_LOLN	-1.98 ~ 1.98	V
J6	AU_HSP	-1.98 ~ 1.98	V
H6	AU_HSN	-1.98 ~ 1.98	V
G4	AU_HPR	-1.98 ~ 1.98	V
H4	AU_HPL	-1.98 ~ 1.98	V
K6	ACCDET	0 ~ 2.94	V

2.4 Recommended Operating Range

Table 2-4. Operation condition

Parameter	Conditions	Min.	Typical	Max.	Unit
Ambient temperature (TA)		-30		85	°C
Junction temperature (TJ)		-30		125	°C
Operating input voltage		3.15 (1)		5	V

(1) Note 1 This minimum input voltage still needs to check the detailed test conditions for each function in specification table.

MediaTek Proprietary and Confidential. © 2023 MediaTek Inc. All rights reserved. Unauthorized reproduction or disclosure of this document, in whole or in part, is strictly prohibited.

2.5 Electrical Characteristics

- VBAT = 2.6V ~ 5V, minimum loads applied on all outputs, unless otherwise noted.
- Typical values are at T_A = 25°C.

Table 2-5. General electrical specifications

Parameter	Conditions	Min.	Typical	Max.	Unit
Operation Ground Current					
Standby without 32K XTAL	Low-power mode		750	950	µA
Power down leakage current without 32K XTAL	VBAT=4.5V, Temp=25°C			95	uA
Under Voltage (UV)					
Under voltage falling threshold		2.55	2.6	2.65	V
Under voltage rising threshold	R=200K	2.95	3.0	3.05	V
Reset Generator					
Output high		VIO-0.4			V
Output low				0.2	V
PWRKEY					
High voltage		0.7*VBAT			V
Low voltage				0.3*VBAT	V
De-bounce time			32		ms
Control Input Voltage					
Control input high (SPI, SRCLKEN related)		0.7*VIO			V
Control input low (SPI, SRCLKEN related)				0.3*VIO	V
Thermal Shut-down					
PMIC shut-down threshold			150		°C
Shut-down release threshold			110		°C

2.6 Regulator Output

Table 2-6. Buck specifications

Parameter	Conditions	Min.	Typical	Max.	Unit
Buck – VPROC11					
Turn-on overshoot	Vout=0.8V No load			10	%
OCP (over-current protection)		6		7.5	A
Soft start	Vout=0.8V No load			200	us
Switching frequency	I_LOAD=0.8A	1.89	2.1	2.31	MHz
Output ripple voltage (CCM)	VBAT=3.8V, I_Load=0.5*Imax 20MHz measurement BW			10	mVpp
Load transient (CCM)	VBAT=3.8V/Vout=1.12V I_LOAD = 2.36A to 5A	-6.25% +8mV		+8.00% -8mV	%

MediaTek Proprietary and Confidential. © 2023 MediaTek Inc. All rights reserved. Unauthorized reproduction or disclosure of this document, in whole or in part, is strictly prohibited.

Parameter	Conditions	Min.	Typical	Max.	Unit
	(Tr/Tf=1 us)				
Line transient	Vbat=4.3V to 5V I_LOAD = 0A to Imax*0.5 (Tr/Tf=15 us)	-6.25% +8mV		+8.00% -8mV	%
DC accuracy (Included Line/Load regulation @CCM)	VBAT=3.2 to 5.0V I_Load= CCM Load	-5.5		+5.5	mV
DC accuracy (Included Line/Load regulation @PFM)	VBAT=3.2 to 5.0V I_Load= PFM Load	-5.5		+20	mV
Output discharge switch on resistance				50	Ω
Buck – VPROC12					
Turn-on overshoot	Vout=0.8V No load			10	%
OCP (over-current protection)		6		7.5	A
Soft start	Vout=0.8V No load			200	us
Switching frequency	I_LOAD=0.8A	1.89	2.1	2.31	MHz
Output ripple voltage (CCM)	VBAT=3.8V, I_Load=0.5*Imax 20MHz measurement BW			10	mVpp
Load transient (CCM)	VBAT=3.8V/Vout=1.12V I_LOAD = 1.06A to 3.19A (Tr/Tf=1 us)	-6.25% +8mV		+8.00% -8mV	%
Line transient	Vbat=4.3V to 5V I_LOAD = 0A to Imax*0.5 (Tr/Tf=15 us)	-6.25% +8mV		+8.00% -8mV	%
DC accuracy (Included Line/Load regulation @CCM)	VBAT=3.2 to 5.0V I_Load=CCM Load	-5.5		+5.5	mV
DC accuracy (Included Line/Load regulation @PFM)	VBAT=3.2 to 5.0V I_Load= PFM Load	-5.5		+20	mV
Output discharge switch on resistance				50	Ω
Buck – VGPU					
Turn-on overshoot	Vout=0.8V No load			10	%
OCP (over-current protection)		6		7.5	A
Soft start	Vout=0.8V No load			200	Us
Switching frequency	I_LOAD=0.8A	1.89	2.1	2.31	MHz
Output ripple voltage (CCM)	VBAT=3.8V, I_Load=0.5*Imax 20MHz measurement BW			10	mVpp
Load transient (CCM)	VBAT=3.8V/Vout=0.9V I_LOAD = 0.74A to 3.31A (Tr/Tf=1 us)	-6.25% +8mV		+8.00% -8mV	%

MediaTek Proprietary and Confidential. © 2023 MediaTek Inc. All rights reserved. Unauthorized reproduction or disclosure of this document, in whole or in part, is strictly prohibited.

Parameter	Conditions	Min.	Typical	Max.	Unit
Line transient	Vbat=4.3V to 5V I_LOAD = 0A to Imax*0.5 (Tr/Tf=15 us)	-6.25% +8mV		+8.00% -8mV	%
DC accuracy (Included Line/Load regulation @CCM)	VBAT=3.2 to 5.0V I_Load=CCM Load	-5.5		+5.5	mV
DC accuracy (Included Line/Load regulation @PFM)	VBAT=3.2 to 5.0V I_Load= PFM Load	-5.5		+20	mV
Output Discharge Switch On Resistance				50	Ω
Buck – VCORE					
Turn-on overshoot	Vout=0.8V No load			10	%
OCP (over-current protection)		6		7.5	A
Soft start	Vout=0.8V No load			200	Us
Switching frequency	I_LOAD=0.8A	1.89	2.1	2.31	MHz
Output ripple voltage (CCM)	VBAT=3.8V, I_Load=0.5*Imax 20MHz measurement BW			10	mVpp
Load transient (CCM)	VBAT=3.8V/Vout=0.8V I_LOAD = 0.8A to 4.9A (Tr/Tf=2 us)	-6.25% +8mV		+8.00% -8mV	%
Line transient	Vbat=4.3V to 5V I_LOAD = 0A to Imax*0.5 (Tr/Tf=15 us)	-6.25% +8mV		+8.00% -8mV	%
DC accuracy (Included Line/Load regulation @CCM)	VBAT=3.2 to 5.0V I_Load=CCM Load	-5.5		+5.5	mV
DC accuracy (Included Line/Load regulation @PFM)	VBAT=3.2 to 5.0V I_Load= PFM Load	-5.5		+20	mV
Output Discharge Switch On Resistance				50	Ω
Buck – VMODEM					
Turn-on overshoot	Vout=0.775V No load			10	%
OCP (over-current protection)	Imax=3.25A	Imax*1.2		Imax*1.5	A
Soft start	Vout=0.775V No load			900	us
Switching frequency	I_LOAD =1.5A	2.25	2.5	2.75	MHz
Output ripple voltage (CCM)	VBAT=3.8V, I_Load=0.5*Imax 20MHz measurement BW		5	10	mVpp
Load transient (CCM)	VBAT=3.8V,Vo=0.775V I_LOAD = 4 mA to 860 mA (Tr/Tf=1 us)	-3.4		+4.9	%
Line transient	Vbat=3.8V to 4.5V ,Vo=0.775V I_LOAD = Imax*0.5	-3.4		+4.9	%

MediaTek Proprietary and Confidential. © 2023 MediaTek Inc. All rights reserved. Unauthorized reproduction or disclosure of this document, in whole or in part, is strictly prohibited.

Parameter	Conditions	Min.	Typical	Max.	Unit
	(Tr/Tf=15 us)				
DC accuracy (Included Line/Load regulation @CCM)	VBAT=3.2 to 5.0V I_Load=CCM Load	-1		+1	%
DC accuracy (Included Line/Load regulation @PFM)	VBAT=3.2 to 5.0V I_Load= PFM Load	-1%		+1%+20mV	%
Output Discharge Switch On Resistance				150	Ω
Buck – VPA					
Turn-on overshoot	Vo =3.4V , No load			10	%
OCP (over-current protection)	Vo=3.4V		3.2		A
Soft start	VBAT=3.8 No load Vo=0.5V/3.4V		250		us
Switching Frequency	I_Load=PWM Load Vout=3.4V	1.8	2	2.2	MHz
Output ripple voltage	a) PFM ripple b) PWM ripple c) PWM ripple @ 0.2V < VBAT-VPA < 1V 20MHz measurement BW			a) 150 b) 50 c) 150	mVpp
Load transient	VBAT=3.8V, Vout=3.4V ILOAD= 50mA <-> 800mA (Tr/Tf=1.6 us)			400	mV
Line transient	Vbat=3.8V to 4.5V Vo=1.7V I_LOAD = 0.2A (Tr/Tf=15 us)			200	mV
DC accuracy (Included Line/Load regulation @CCM)	VBAT=3.15 to 5.0V Vout=0.5~1V I_Load=PWM Load	-20		+40	mV
	VBAT=3.15 to 5.0V VBAT– Vout ≥ 600 mV Vout ≥ 1V I_Load=PWM Load	-2		+2	%
Output discharge switch on resistance				600	Ω
Buck – VS1					
Turn-on overshoot	No load			10	%
OCP (over-current protection)		Imax*1.2		Imax*2	A
Soft start	No load			1	ms
Switching frequency	I_LOAD =1A	2.16	2.4	2.64	MHz
Output ripple voltage (CCM)	VBAT=3.8V, I_Load=0.5*Imax 20MHz measurement BW			12	mVpp
Load transient	VBAT=3.8V I_LOAD = 800mA <–> 2000mA (Tr/Tf=10us)	-4.0		+5.5	%

MediaTek Proprietary and Confidential. © 2023 MediaTek Inc. All rights reserved. Unauthorized reproduction or disclosure of this document, in whole or in part, is strictly prohibited.

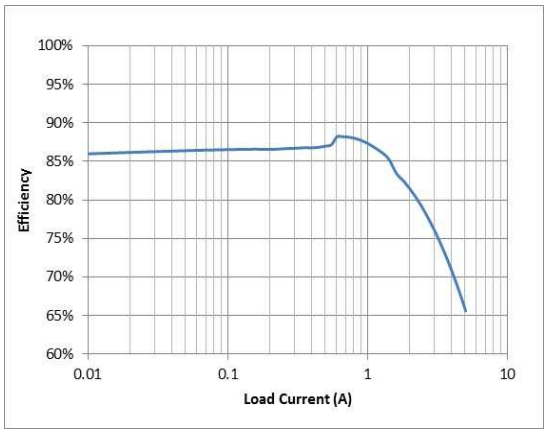
Parameter	Conditions	Min.	Typical	Max.	Unit
Line transient	Vbat=3.8V to 4.5V I_LOAD = Imax*0.5 (Tr/Tf=15 us)	-4		+5.5	%
DC accuracy (Included Line/Load regulation @CCM)	VBAT=3.2 to 5.0V I_Load=CCM Load	-0.9		+0.9	%
DC accuracy (Included Line/Load regulation @PFM)	VBAT=3.2 to 5.0V I_Load=PFM Load	-0.9		+4.1	%
Output Discharge Switch On Resistance				300	Ω
Buck – VS2					
Turn-on overshoot	No load			10	%
OCP (over-current protection)		Imax*1.2		Imax*2	A
Soft start	No load			1	ms
Switching frequency	I_LOAD =1A	2.25	2.5	2.75	MHz
Output ripple voltage (CCM)	VBAT=3.8V, I_Load=0.5*Imax 20MHz measurement BW			8.1	mVpp
Load transient	VBAT=3.8V (Tr/Tf=10us) I_LOAD = 800mA <–> 2000mA (Tr/Tf=10us)	-4.0		+5.5	%
Line transient	Vbat=3.8V to 4.5V I_LOAD = Imax*0.5 (Tr/Tf=15 us)	-4		+5.5	%
DC accuracy (Included Line/Load regulation @CCM)	VBAT=3.2 to 5.0V I_Load=CCM Load	-0.9		+0.9	%
DC accuracy (Included Line/Load regulation @PFM)	VBAT=3.2 to 5.0V I_Load=PFM Load	-0.9		+4.1	%
Output discharge switch on resistance				300	Ω
Buck – VDRAM1					
Turn-on overshoot	No load			10	%
OCP (over-current protection)		Imax*1.2		Imax*2	A
Soft start	No load			1	ms
Switching frequency	I_LOAD =1A	2.25	2.5	2.75	MHz
Output ripple voltage (CCM)	VBAT=3.8V, I_Load=0.5*Imax 20MHz measurement BW			6.75	mVpp
Load transient	VBAT=3.8V Vout=1.125V I_LOAD = 100mA <–> 800mA. (Tr/Tf=1uS)	-45		45	mV
Line transient	Vbat=3.8V to 4.5V I_LOAD = Imax*0.5 (Tr/Tf=15 us)	-3		3	%

MediaTek Proprietary and Confidential. © 2023 MediaTek Inc. All rights reserved. Unauthorized reproduction or disclosure of this document, in whole or in part, is strictly prohibited.

Parameter	Conditions	Min.	Typical	Max.	Unit
DC accuracy (Included Line/Load regulation @CCM)	VBAT=3.2 to 5.0V I_Load=CCM Load	-0.9		+0.9	%
DC accuracy (Included Line/Load regulation @PFM)	VBAT=3.2 to 5.0V I_Load=PFM Load	-0.9		+4.1	%
Output discharge switch on resistance				300	Ω

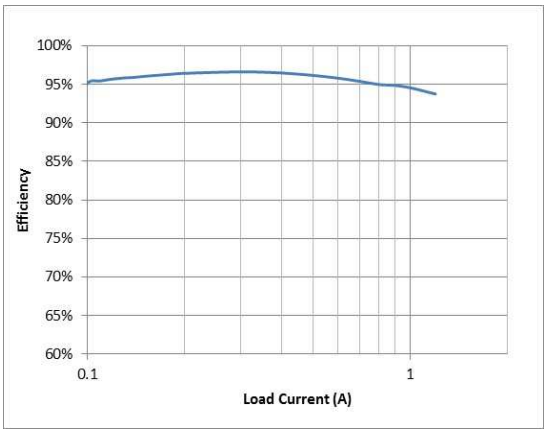
MediaTek Proprietary and Confidential. © 2023 MediaTek Inc. All rights reserved. Unauthorized reproduction or disclosure of this document, in whole or in part, is strictly prohibited.

Efficiency with condition of VIN = 3.7V, T_A = 25°C and in Auto-Mode are shown as below.



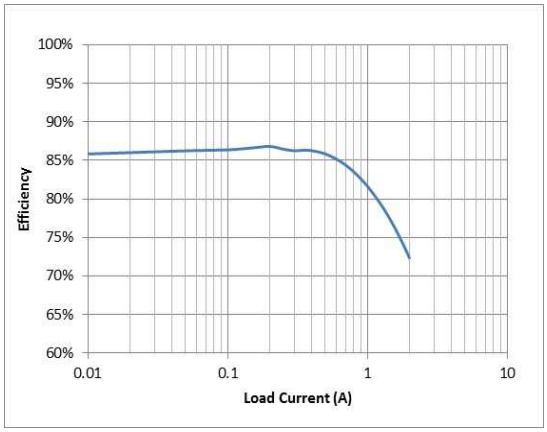
VOUT = 0.95V, L = 0.47uH (DCR typ. 17mohm), COUT = 22uF*2

Figure 2-1. VPROC11/VPROC12/VGPU/VCORE Efficiency



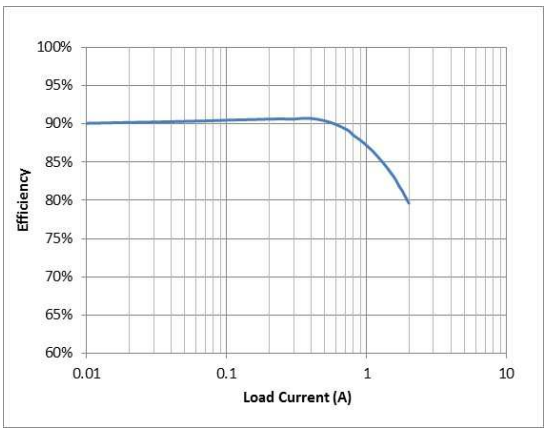
VOUT = 3.4V, L = 1.0uH (DCR typ. 44mohm), COUT = 1uF+6.2uF

Figure 2-2. VPA Efficiency



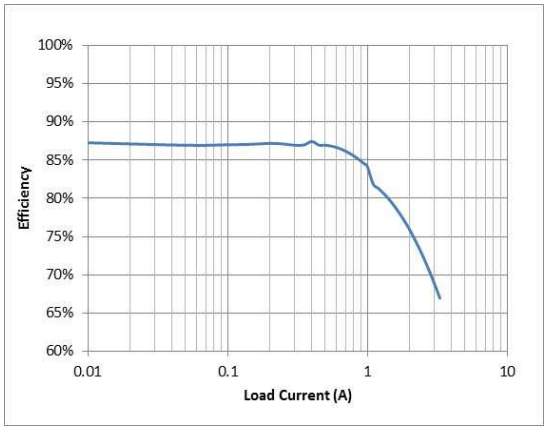
V VOUT = 1.125V, L = 1uH (DCR typ. 26mohm), COUT = 22uF*3

Figure 2-3. VDRAM1 Efficiency



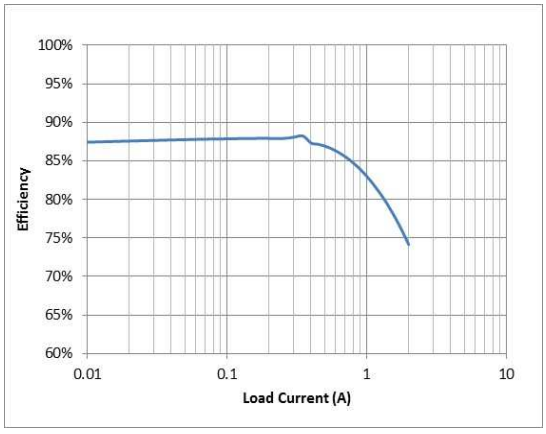
VOUT = 2.0V, L = 1uH (DCR typ. 26mohm), COUT = 22uF+10uF

Figure 2-4. VS1 Efficiency



VOUT = 0.85V, L = 1uH (DCR typ. 26mohm), COUT = 22uF*2

Figure 2-5. VMODEM Efficiency



VOUT = 1.35V, L = 1uH (DCR typ. 26mohm), COUT = 22uF

Figure 2-6. VS2 Efficiency

MediaTek Proprietary and Confidential. © 2023 MediaTek Inc. All rights reserved. Unauthorized reproduction or disclosure of this document, in whole or in part, is strictly prohibited.

Table 2-7. LDO specifications

Parameter	Type	Conditions		Min.	Typ.	Max.	Unit
Power source	ALDO and DLDO	VBAT voltage		max{Vo+0.35 ; 3.15}		5	V
	SLDO1 and SLDO2	VBAT voltage		3.15		5	V
	SLDO1	VS1=2.0V		max{Vo+0.15 ; 2*0.95}		2*1.05	V
	SLDO2	VS2=1.35V		max{Vo+0.1 ; 1.35*0.95}		1.35*1.05	V
Overall DC voltage accuracy	ALDO, DLDO and SLDO Normal mode	Default voltage		-1.5		+1.5	%
		Non default voltage		-3		+3	%
	ALDO, DLDO and SLDO Low power mode	All voltages		-4		+4	%
Load regulation	ALDO, DLDO and SLDO Normal mode	Iout = 0mA~Imax	1. Power source 2. Typical capacitor 3. TA= -40°C~+85°C	-1.5		+1.5	%
	ALDO, DLDO and SLDO Low power mode	Iout= 0mA~Low power mode Imax		-4		+4	%
	VRTC, DVDD18_DIG	Iout = 0mA~0.2*I max		-10		+10	%
Line regulation	ALDO, DLDO and SLDO	Iout = 0mA	1. Power source 2. Typical capacitor 3. TA= -40°C ~+85°C	-1.5		+1.5	%
	VRTC, DVDD18_DIG	Iout = 0mA		-5		5	%
Low power mode Imax	LP mode ALDO, DLDO and SLDO	Default voltage	1. Power source 2. Typical capacitor 3. TA= +25°C	5			mA
Power off voltage	ALDO, DLDO and SLDO	Iou t= 0mA	1. Power source 2. Typical capacitor 3. TA= -40°C ~+85°C		0.1		V
Load transient response	ALDO	Iout = 1mA~0.5*I max@ Slew rate = 15mA/us		-4		+4	%

MediaTek Proprietary and Confidential. © 2023 MediaTek Inc. All rights reserved. Unauthorized reproduction or disclosure of this document, in whole or in part, is strictly prohibited.

Parameter	Type	Conditions		Min.	Typ.	Max.	Unit
	DLDO and SLDO	Iout = 1mA~0.5*Imax@ Slew rate = 80mA/us	1. Power source 2. Typical capacitor 3. TA= -40°C ~+85°C				
Turn-on rise time	ALDO, DLDO and SLDO	Iout = 0mA	1. Power source 2. Typical capacitor 3. TA= 25°C			300	us
Turn-on overshoot	ALDO, DLDO and SLDO	Iout = 0mA	1. Power source 2. Typical capacitor 3. TA= 25°C			Max{10%,100mV}	
Normal mode quiescent current	ALDO	Iout = 0mA	1. Power source 2. Typical capacitor 3. TA= 25°C			55	uA
	DLDO					55	
	SLDO (Current loading ≦0.3A)					100	
	SLDO (0.3A<Current loading≦0.6A)					160	
	SLDO (Current loading > 0.6A)					220	
	VRTC and DVDD18_DIG					10	
Low power mode quiescent current	SLDO					20	
	ALDO, DLDO					15	
	VSRAM_XX					30	
Power off time	ALDO, DLDO and SLDO	Iout = 0mA	1. Power source 2. Capacitor ≦ 2.2uF 3. TA= 25°C			4	ms
			1. Power source 2. Capacitor ≦ 9.4uF 3. TA= 25°C			12	ms
Output noise	ALDO	Freq = 10Hz to 80kHz	1. Power source 2. Typical capacitor 3. TA= +25°C 4. Iout = 10mA~0.5*Imax		90		uVrms
	DLDO and SLDO				500		uVrms
	ALDO, DLDO and SLDO	Freq = 10Hz to 10MHz			1000		uVrms

MediaTek Proprietary and Confidential. © 2023 MediaTek Inc. All rights reserved. Unauthorized reproduction or disclosure of this document, in whole or in part, is strictly prohibited.

Parameter	Type	Conditions		Min.	Typ.	Max.	Unit
PSRR	ALDO	Freq = 217Hz to 3kHz	1. Power source 2. Typical capacitor 3. TA= +25°C 4. Iout = 10mA~0.5*Imax		65		dB
		Freq= 3kHz to 30kHz			45		dB
	DLDO and SLDO	Freq = 217Hz			40		dB
	VCAMAx	Freq= 30kHz to 100kHz	1. Power source 2. Typical capacitor 3. TA= +25°C 4. Iout = 10mA~30mA		40		dB
Short current	Normal mode ALDO, DLDO and SLDO	OC	1. Power source 2. Typical capacitor 3. TA= +25°C	1.2xImax		3xImax	
		OCFB		0.2xImax		2xImax	
	LP mode ALDO, DLDO and SLDO	OC		10mA		2xImax	

MediaTek Proprietary and Confidential. © 2023 MediaTek Inc. All rights reserved. Unauthorized reproduction or disclosure of this document, in whole or in part, is strictly prohibited.

3 MT6358 Packaging

3.1 Package Dimensions

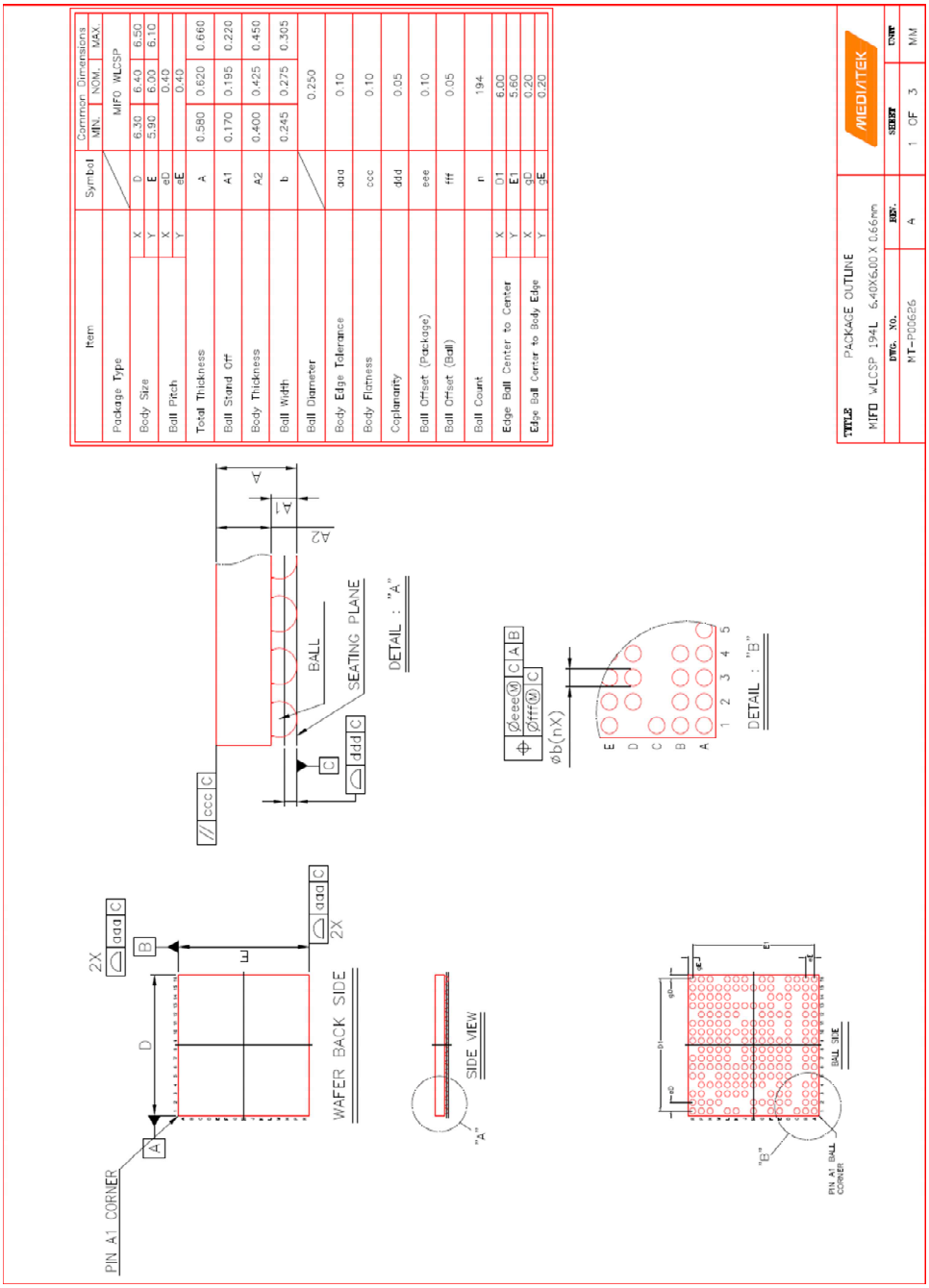


Figure 3-1. Package dimension

MediaTek Proprietary and Confidential. © 2023 MediaTek Inc. All rights reserved. Unauthorized reproduction or disclosure of this document, in whole or in part, is strictly prohibited.

Exhibit 1 Terms and Conditions

Your access to and use of this document and the information contained herein (collectively this "Document") is subject to your (including the corporation or other legal entity you represent, collectively "You") acceptance of the terms and conditions set forth below ("T&C"). By using, accessing or downloading this Document, You are accepting the T&C and agree to be bound by the T&C. If You don't agree to the T&C, You may not use this Document and shall immediately destroy any copy thereof.

This Document contains information that is confidential and proprietary to MediaTek Inc. and/or its affiliates (collectively "MediaTek") or its licensors and is provided solely for Your internal use with MediaTek's chipset(s) described in this Document and shall not be used for any other purposes (including but not limited to identifying or providing evidence to support any potential patent infringement claim against MediaTek or any of MediaTek's suppliers and/or direct or indirect customers). Unauthorized use or disclosure of the information contained herein is prohibited. You agree to indemnify MediaTek for any loss or damages suffered by MediaTek for Your unauthorized use or disclosure of this Document, in whole or in part.

MediaTek and its licensors retain titles and all ownership rights in and to this Document and no license (express or implied, by estoppels or otherwise) to any intellectual propriety rights is granted hereunder. This Document is subject to change without further notification. MediaTek does not assume any responsibility arising out of or in connection with any use of, or reliance on, this Document, and specifically disclaims any and all liability, including, without limitation, consequential or incidental damages.

THIS DOCUMENT AND ANY OTHER MATERIALS OR TECHNICAL SUPPORT PROVIDED BY MEDIATEK IN CONNECTION WITH THIS DOCUMENT, IF ANY, ARE PROVIDED "AS IS" WITHOUT WARRANTY OF ANY KIND, WHETHER EXPRESS, IMPLIED, STATUTORY, OR OTHERWISE. MEDIATEK SPECIFICALLY DISCLAIMS ALL WARRANTIES OF MERCHANTABILITY, NON-INFRINGEMENT, FITNESS FOR A PARTICULAR PURPOSE, COMPLETENESS OR ACCURACY AND ALL WARRANTIES ARISING OUT OF TRADE USAGE OR OUT OF A COURSE OF DEALING OR COURSE OF PERFORMANCE. MEDIATEK SHALL NOT BE RESPONSIBLE FOR ANY MEDIATEK DELIVERABLES MADE TO MEET YOUR SPECIFICATIONS OR TO CONFORM TO A PARTICULAR STANDARD OR OPEN FORUM.

Without limiting the generality of the foregoing, MediaTek makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does MediaTek assume any liability arising out of the application or use of any product, circuit or software. You agree that You are solely responsible for the designing, validating and testing Your product incorporating MediaTek's product and ensure such product meets applicable standards and any safety, security or other requirements.

The above T&C and all acts in connection with the T&C or this Document shall be governed, construed and interpreted in accordance with the laws of Taiwan, without giving effect to the principles of conflicts of law.

MediaTek Proprietary and Confidential. © 2023 MediaTek Inc. All rights reserved. Unauthorized reproduction or disclosure of this document, in whole or in part, is strictly prohibited.