



IC

通信用LSI

CONTENTS

A

通信用LSI

地面数字节目接收用LSI	P. A94
日本方式(ISDB-T)(LAPIS Semiconductor产品)	P. A94
近距离无线通信用LSI	P. A94
IEEE802.15.4/ZigBee® LSI(LAPIS Semiconductor产品)	P. A94
Bluetooth® LSI(LAPIS Semiconductor产品)	P. A94
特定小功率无线(Sub-GHz频段无线)(LAPIS Semiconductor产品)	P. A94
MCU搭载特定小功率无线(Sub-GHz频段无线)系统LSI(LAPIS Semiconductor产品)	P. A95
VoIP用LSI	P. A95
VoIP编解码器(LAPIS Semiconductor产品)	P. A95
回声消除器用LSI	P. A95
回声消除器(LAPIS Semiconductor产品)	P. A95
回声消除器/噪音消除器(LAPIS Semiconductor产品)	P. A95
编解码器用LSI	P. A95
PCM编解码器(LAPIS Semiconductor产品)	P. A95
ADPCM编解码器(LAPIS Semiconductor产品)	P. A96
PHS用LSI	P. A96
PHS用调制解调器转码器(LAPIS Semiconductor产品)	P. A96
车载通信用LSI	P. A96
FM数字广播接收用LSI(LAPIS Semiconductor产品)	P. A96



地面数字节目接收用LSI

日本方式(ISDB-T)

(LAPIS Semiconductor产品)

用于1-Seg地面数字节目接收 RF调谐器+OFDM解调							
Part No.	Transmission Standard	Feature	Supply Voltage (V)	Power Consumption	Operating Temperature (°C)	Package	Automotive Grade
ML7147	ISDB-T	Compliant to One-Seg broadcasting of ISDB-T (ARIB STD-B31) digital terrestrial television broadcasting. RF tuner, OFDM demodulate, error correction function. Serial, parallel TS output.	2.7 to 3.0 1.5 to 3.6 1.1 to 1.3	70mW 〔at 1seg reception, include RF〕	− 40 to + 90	WQFN80	YES
地面数字广播用 4根分集天线/全段OFDM解调							
ML7138	ISDB-T	Compliant to Full-Seg and One-Seg broadcasting of ISDB-T (ARIB STD-B31) digital terrestrial television broadcasting. 4 diversity x 1CH or 2 diversity x 2CH reception. OFDM demodulate, error correction function. Serial, parallel TS output.	3.0 to 3.6 2.7 to 3.6 1.1 to 1.3	234mW 〔4 diversity full segment reception〕	− 40 to + 85	TFBGA144	YES

近距离无线通信用LSI

IEEE802.15.4/ZigBee® LSI

(LAPIS Semiconductor产品)

串行接口收发信LSI (支持RF4CE)											
Part No.	Supported Standard	Frequency Band	Supply Voltage (V)	Modulation Method	Function	Control interface	Transmission Rate (Kbps)	Transmission Output (dBm)	Reception Sensitivity (dBm)	Operating Temperature (°C)	Package
ML7275	IEEE802.15.4 ZigBee®RF4CE	2.4GHz ISM Band	1.8 to 3.6	O-QPSK	8 × 8 Key scan UAP Area : 1.7KB	Synchronous serial or UART	250	− 45 to 0 (3 step)	− 92 ¹	− 40 to + 85	WQFN40

* ZigBee®是ZigBee®Alliance的注册商标。
*1: PER(Packet Error Rate)<1%

Bluetooth® LSI

(LAPIS Semiconductor产品)

Bluetooth® LSI											
Part No.	Supported Standard	Frequency Band	Supply Voltage (V)	Modulation Method	Function	Control interface	Transmission Rate (Mbps)	Transmission Output (dBm)	Reception Sensitivity (dBm)	Operating Temperature (°C)	Package
ML7105-002	Bluetooth® core spec. v4.0 (Single mode)	2.4GHz ISM band	1.6 to 3.6	GFSK	Role : Master/Slave Connectable device(s) : 1 device	(BACI ¹) SPI (HCI ²) UART	1	0 / − 6 / − 12 / − 18	− 85 ³	− 20 to + 70	WQFN32
New ML7125-001	Bluetooth® core spec. v4.1 (Single mode)	2.4GHz ISM band	1.6 to 3.6	GFSK	Role : Master/Slave Connectable device(s) : 2 devices	(BACI ¹) SPI (HCI ²) UART	1	+ 4/0 / − 6 / − 12 / − 18	− 85 ³	− 20 to + 75	WCSP67
New ML7125-002	Bluetooth® core spec. v4.1 (Single mode)	2.4GHz ISM band	1.6 to 3.6	GFSK	Role : Slave only Connectable device(s) : 1 device	UART	1	+ 4/0 / − 6 / − 12 / − 18	− 85 ³	− 20 to + 75	WCSP67

*1 : BACI(Bluetooth Application Controller Interface) : LAPIS Semiconductor独有的主机接口 *2 : HCI(Host Control Interface) : Bluetooth标准接口
*3 : 相当于BER(Bit Error Rate)<0.1% ※Bluetooth® 是Bluetooth® SIG的注册商标。

特定小功率无线(Sub-GHz频段无线)

(LAPIS Semiconductor产品)

数据发信专用LSI											
Part No.	Supported Standard	Frequency Band	Supply Voltage (V)	Modulation Method	FEC Mode	Control interface	Transmission Rate	Transmission Output (dBm)	Reception Sensitivity	Operating Temperature (°C)	Package
ML7386	ARIB STD-T67, RCR STD-30	200 to 972MHz	1.8 to 3.6	2-FSK MSK	—	Synchronous serial (Control) DIO(DATA)	2.4kbps 4.8kbps 7.2kbps	10mW	—	− 25 to + 85	WQFN28
ML7386B								1mW/10mW			
数据收发信LSI											
ML7066[J]	ARIB STD-T67, RCR STD-30	426MHz band 429MHz band	2.1 to 3.6	2-FSK	—	Synchronous serial (Control) DIO(DATA)	1.2kbps, 2.4kbps 4.8kbps [NRZ] (3-step setting function)	1mW/ 10mW	− 116dBm [BER<1%] ^{*2}	− 25 to + 65	VQFN48
ML7396D	ARIB STD-T108	750 to 960MHz	1.8 to 3.6	2-(G)FSK (G)MSK	IEEE 802.15.4g compliant	Synchronous serial (Control) DIO(DATA)	to 50kbps 100kbps 150kbps 200kbps 400kbps	1mW/ 10mW/ 20mW	− 107dBm [100kbps BER=0.1%] ^{*2}	− 40 to + 85	WQFN40
ML7396B									− 106dBm [100kbps BER=0.1%] ^{*2}		
ML7396A											
ML7396E											
	FCC part15.247/249										
ML7396E	EN300-220										
ML7344J	ARIB STD-T67, RCR STD-30	160 to 510MHz	1.8 to 3.6	2-(G)FSK (G)MSK	—	Synchronous serial (Control) DIO(DATA)	to 15kbps	1mW/ 10mW/ 20mW	− 117dBm [4.8kbps BER=0.1%] ^{*2}	− 40 to + 85	WQFN32
ML7344C	Q/GDW347.3		3.3 to 3.6 (100mW)					20mW/ 100mW			
ML7406	EN300-220 EN13757-4 : 2011	750 to 960MHz	1.8 to 3.6	2-(G)FSK (G)MSK	—	Synchronous serial (Control) DIO(DATA)	to 500kbps	1mW/ 10mW/ 20mW	− 106dBm [100kbps BER=0.1%] ^{*2}	− 40 to + 85	WQFN32
ML7345	ARIB STD-T67 ARIB STD-T108 RCR STD-30 EN300-220 EN13757-4 : 2013	160 to 960MHz	1.8 to 3.6	2-(G)FSK (G)MSK 4-(G)FSK	—	Synchronous serial (Control) DIO(DATA)	to 100kbps	1mW/ 10mW/ 20mW	− 123dBm [2.4kbps BER=1%] ^{*2}	− 40 to + 85	WQFN32
ML7345C	Q/GDW347.3	470 to 510MHz	3.3 to 3.6 (100mW)	2-(G)FSK (G)MSK 4-(G)FSK	—	Synchronous serial (Control) DIO(DATA)	to 100kbps	20mW/ 100mW	− 123dBm [2.4kbps BER=1%] ^{*2}	− 40 to + 85	WQFN32

[J]: This LSI is limited to the market in Japan. *2 : BER is Bit Error Rate的缩写。

MCU搭载特定小功率无线(Sub-GHz频段无线) 系统LSI

(LAPIS Semiconductor产品)

数据收发信LSI

Part No.	Support Standard	Frequency Band	Supply Voltage (V)	Modulation Method	CPU core	Memory resources	Transmission Rate	Transmission Output (dBm)	Reception Sensitivity	Operating Temperature (°C)	Package
New ML7416N	ARIB STD-T108	750 to 960MHz	1.8 to 3.6	2-(G)FSK (G)MSK	CorTex-M0+	FLASH512KB, RAM64KB	to 50kbps 100kbps 150kbps 200kbps 400kbps	1mW/ 10mW/ 20mW	−106dBm [100kbps BER = 0.1%]*2	−40 to +85	BGA81

*2 : BER是Bit Error Rate的缩写。

VoIP用LSI

VoIP编解码器

(LAPIS Semiconductor产品)

VoIP编解码器

Part No.	Speech Compression Method	Channel number	Operating Frequency (MHz)	Supply Voltage (V)	Supply Current (Max.)	Operating Temperature (°C)	Package
ML7074-003	G.729.A/G.726/G.711	1	4.096	3.0 to 3.6	65mA	− 20 to + 60	QFP64
ML7074-004	G.729.A/G.711		4.096	3.0 to 3.6	65mA		QFP64
ML7204-003	G.729.A/G.711		12.288	3.0 to 3.6	65mA		QFP64
2ch VoIP编解码器							
ML7214A-001	G.711	2	12.288	3.0 to 3.6	65mA	− 20 to + 60	TQFP100
4ch VoIP编解码器							
ML7224A-001	G.711	4	12.288	3.0 to 3.6	125mA	− 20 to + 60	LQFP176

回声消除器用LSI

回声消除器

(LAPIS Semiconductor产品)

双重回声消除器+ADPCM转码器

Part No.	Cancelable Echo Delay Time	Voice Signal Interface	Supply Voltage (V)	Operating Frequency (MHz)	Notes	Package
ML7202-001	64ms/channel	μ-law, A-law	3.0 to 3.6	19.2	Dual echo canceller + ADPCM transcoder Tone Gen/Det., VOX, Gain Control, Time Slot Assignment, etc.	TQFP64

回声消除器/噪音消除器

(LAPIS Semiconductor产品)

双重回声消除器/带双音编解码器的噪音消除器

Part No.	Cancelable Echo Delay Time	Voice Signal Interface	Supply Voltage (V)	Operating Frequency (MHz)	Notes	Package
ML7037-003	Acoustic side 64ms, Line side 20ms	Acoustic side : analog, Line side : analog, 16-bit linear, μ-law PCM	3.0 to 3.6	12.288	Dual echo canceller/noise canceller with dual Codec Noise cancellation = 6 to 18dB	TQFP64
回声消除器/附带双宽带编解码器的噪音消除器						
ML7247-001	Acoustic side 64ms	Acoustic side : analog, Line side : analog, 16-bit linear	3.0 to 3.6	12.288	Echo canceller/Noise canceller with dual wide-band codec Noise cancellation = 1 to 45dB Sampling frequency = 8kHz or 16kHz	TQFP64

编解码器用LSI

PCM编解码器

(LAPIS Semiconductor产品)

多功能2ch PCM编解码器

Part No.	PCM sign			Channel Number	Supply Voltage (V)	PCM Synchronous Type		Analog Output			Notes	Package
	μ-law	A-law	14-bit linear			long	short	full swing	output load	differential		
ML7033-01	✓	✓	✓	2	4.75 to 5.25	✓	✓	3.4Vpp	20kΩ	—	Multifunction 2ch PCM CODEC	QFP64
3V线性PCM编解码器												
ML7041	✓	✓	✓	1	2.4 to 3.3	✓	✓	2.6Vpp	8Ω	✓	3V linear PCM Codec With tone generators regulators and I ² C I/F	TQFP48
MSM7732A	✓	✓	✓	1	2.4 to 3.3	✓	✓	3.0Vpp	32Ω	✓	3V linear PCM Codec With tone generators	TQFP48/ BGA48
3V 1ch PCM编解码器												
MSM7717-01	✓	✓	—	1	2.7 to 3.8	✓	—	2.0Vpp	600Ω	✓	3V 1ch PCM CODEC	SSOP20
3V 2ch PCM编解码器												
MSM7704-01	✓	✓	—	2	2.7 to 3.8	✓	—	2.0Vpp	1.2kΩ	—	3V 2ch PCM CODEC	SOP24
5V 1ch PCM编解码器												
MSM7578V	✓	✓	—	1	4.75 to 5.25	✓	—	2.4Vpp	600Ω	—	5V 1ch PCM CODEC	SOP24/ SSOP20
5V 2ch PCM编解码器												
MSM7533V	✓	✓	—	2	4.75 to 5.25	✓	—	3.4Vpp	600Ω	—	5V 2ch PCM CODEC	SOP24

ADPCM编解码器

(LAPIS Semiconductor产品)

G.726标准ADPCM编解码器								
Part No.	PCM Interface	Operating Frequency (MHz)	Supply Voltage (V)	Analog Output	Supply Current (Max.)	Operating Temperature (°C)	Note	Package
ML7029	μ-Law	10.368	2.7 to 3.6	1.3Vpp, 20kΩ	12mA	− 25 to + 70	ADPCM Codec compliant with G.726	SSOP30

PHS用LSI

PHS用调制解调器 / 转码器

(LAPIS Semiconductor产品)

π /4转换QPSK调制解调器					
Part No.	Feature	Supply Voltage (V)	Supply Current (Typ.)	Operating Temperature (°C)	Package
MSM7582B	π /4 shift QPSK modem	2.7 to 3.6	14mA	− 25 to + 70	TSOP(I)32
4ch ADPCM转码器					
MSM7581	4ch ADPCM transcoder	2.7 to 5.5	5mA	− 30 to + 80	TQFP100

车载通信用LSI

FM数字广播接收用LSI

(LAPIS Semiconductor产品)

FM数字广播接收调谐器						
Part No.	Feature	Supply Voltage (V)	Supply Current (Max.)	Operating Temperature (°C)	Package	Automotive Grade
☆ML7174[J]	FM VICS® tuner, FM multiplexing demodulate LSI for VICS®. Built-in BPF, frame memory, and VICS® descrambler, Frames A,B,C, SPI slave	3.0 to 3.6	TBD	− 40 to + 85	WQFN64	YES
☆ML7183[J]	FM VICS® tuner & Filter LSI, BPF, I²C slave	3.0 to 3.6	TBD	− 40 to + 85	WQFN64	YES
支持VICS® FM多路解调						
ML7154[J]	VICS® compliant FM multiplexing demodulate LSI for VICS®. Built-in BPF, frame memory, and VICS® descrambler, Frames A,B,C, SPI slave	3.0 to 3.6	28mA	− 40 to + 85	WQFN64	YES
支持DARC® FM多路解调						
MSM9563	FM multiplexing demodulate LSI for DARC®,BPF&frame memory built-in, Frames A,B,C,8bit bus interface	3.0 to 3.6	28mA	− 40 to + 85	QFP44	YES

[J]: This LSI is limited to the market in Japan.
VICS® 是美国Vehicle Information and Communication System Center的注册商标。DARC® 是美国NHK Engineering System, Inc.的注册商标。

☆ : 开发中