



Communication LSI

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Digital Terrestrial Broadcasting Reception LSI

Japanese System(ISDB-T)

(LAPIS Semiconductor products)

RF tuner + OFDM Demodulator for 1 Segment Digital Terrestrial Broadcasting											
Part No.	Transmission Standard	Feature				Supply Voltage (V)	Power Consumption	Operating Temperature(°C)	Package	Halogen Free Support*1	Automotive Grade*2
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

*1: A check mark of halogen free support means that we will be able to ship out the halogen free products. For details, please inquire to the sales.
 *2: Please inquire to the sales for AEC-Q100.

Wireless Communication LSIs

IEEE802.15.4

(LAPIS Semiconductor products)

Serial Interface Transceiver LSI												
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	Halogen Free Support*2
ML7275	IEEE802.15.4	2.4GHz ISM Band	1.8 to 3.6	O-QPSK	IEEE802.15.4-2003 PHY/MAC (Not full MAC function)	Synchronous serial or UART	250	-45 to 0 (3 step)	-92*	-40 to +85	WQFN40	✓

*1: PER(Packet Error Rate)<1%
 *2: A check mark of halogen free support means that we will be able to ship out the halogen free products. For details, please inquire to the sales.

Bluetooth®

(LAPIS Semiconductor products)

Bluetooth® Low Energy LSIs												
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	Halogen Free Support*4
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	-86*3	-20 to +70	WQFN32	✓
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	✓
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	✓

Bluetooth® is a registered trademark of Bluetooth®SIG.
 *1: BACI(Bluetooth Application Controller Interface) : Lapis Semiconductor proprietary host interface *2: HCI(Host Control Interface) : Bluetooth standard interface *3: BER(Bit Error Rate)<0.1% equivalent
 *4: A check mark of halogen free support means that we will be able to ship out the halogen free products. For details, please inquire to the sales.

Specified Low Power Radio(Sub-GHz band radio)

(LAPIS Semiconductor products)

UHF Transmitter LSIs												
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	Halogen Free Support*2
ML7386	ARIB STD-T67 RCRSTD-30	426MHz band	1.8 to 3.6	2-FSK MSK	—	Synchronous serial(Control) DI(DATA)	2.4kbps	10mW	—	-25 to +85	WQFN28	✓
ML7386B							4.8kbps	1mW/10mW				
UHF Transceiver LSIs												
ML7066[J]	ARIB STD-T67 RCRSTD-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%]*1	-25 to +65	WQFN48	✓
ML7396D	ARIB STD-T108 EN300-220	750 to 960MHz	1.8 to 3.6	2-(G)FSK (G)MSK	IEEE 802.15.4g compliant	Synchronous serial (Control · DATA) DIO(DATA)	to 50kbps 100kbps 150kbps 200kbps 400kbps	1mW/10mW/20mW	-107dBm [100kbps BER=0.1%]*1	-40 to +85	WQFN40	✓
ML7396A	FCC part15.247/249								-106dBm [100kbps BER=0.1%]*1			
ML7344J	ARIB STD-T67 RCRSTD-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%]*1	-40 to +85	WQFN32	✓
ML7344C	Q/GDW374.3		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%]*1	-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%]*1	-40 to +85	WQFN32	✓
New ML7345D	ARIB STD-T67 ARIB STD-T108 RCR STD-30 EN300-220 EN13757-4:2013	315 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	-119.5dBm [100kbps BER=1%]*1	-40 to +85	WQFN32	✓
ML7345C	Q/GDW374.3	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%]*1	-40 to +85	WQFN32	✓

[J]: This LSI is limited to the market in Japan. *1: BER means Bit Error Rate.
 *2: A check mark of halogen free support means that we will be able to ship out the halogen free products. For details, please inquire to the sales.

LPWA

(LAPIS Semiconductor products)

UHF Transceiver 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	Halogen Free Support ^{*3}
New ML7404	ARIB STD-T67 ARIB STD-T108 RCR STD-30 EN300-220 EN13757-4:2013 Sigfox®(Rev 2.E) IEEE802.15.4k	315 to 960MHz	1.8 to 3.6	2- (G)FSK (G)MSK 4- (G)FSK BPSK DSSS	IEEE 802.15.4k compliant	Synchronous serial(Control) DIO(DATA)	to 101kbps (vFSK) 80k to 200kcps (DSSS)	1mW/ 10mW/ 20mW	- 119.5dBm [2.4kbps BER=1%] ^{*1} (vFSK) - 121dBm [200kcps, SF=64, PER=1%] ^{*2} (DSSS)	- 40 to + 85	WQFN32	✓

Sigfox® is a registered trademark of SIGFOX S.A.

*1: BER means Bit Error Rate. *2: PER means Packet Error Rate.

*3: A check mark of halogen free support means that we will be able to ship out the halogen free products. For details, please inquire to the sales.

MCU Included Specified Low Power Radio(Sub-GHz band radio)System LSI

(LAPIS Semiconductor products)

UHF Transceiver LSI												
Part No.	Supported Standard	Frequency Band	Supply Voltage (V)	Modulation Method	CPU Core	Memory Resources	Transmission Rate	Transmission Output (dBm)	Reception Sensitivity	Operating Temperature (°C)	Package	Halogen Free Support ^{*2}
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%] ^{*1}	- 40 to + 85	BGA81	✓

Cortex® is a registered trademark of ARM Limited(or it's child company) in the EU and the other companies.

*1: BER means Bit Error Rate. *2: A check mark of halogen free support means that we will be able to ship out the halogen free products. For details, please inquire to the sales.

VoIP LSIs

VoIP CODEC

(LAPIS Semiconductor products)

VoIP CODEC									
Part No.	Speech Compression Method	Channel number	Operating Frequency (MHz)	Supply Voltage (V)	Supply Current (Max.)	Operating Temperature (°C)	Package	Halogen Free Support ^{*1}	
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 CODEC									
ML7214A-001	G.711	2	12.288	3.0 to 3.6	65mA	-20 to +60	TQFP100	✓	
4ch VoIP CODEC									
ML7224A-001	G.711	4	12.288	3.0 to 3.6	125mA	-20 to +60	LQFP176	✓	

*1: A check mark of halogen free support means that we will be able to ship out the halogen free products. For details, please inquire to the sales.

Echo Canceller LSIs

Echo Canceller

(LAPIS Semiconductor products)

Dual Echo Canceller + ADPCM Transcoder							
Part No.	Cancelable Echo Delay Time	Voice Signal Interface	Supply Voltage (V)	Operating Frequency (MHz)	Notes	Package	Halogen Free Support ^{*1}
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	✓

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Echo Canceller/Noise Canceller

(LAPIS Semiconductor products)

Dual Echo Canceller/Noise Canceller with Dual CODEC							
Part No.	Cancelable Echo Delay Time	Voice Signal Interface	Supply Voltage (V)	Operating Frequency (MHz)	Notes	Package	Halogen Free Support ^{*1}
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	✓
Echo Canceller/Noise Canceller with Dual Wide-band CODEC							
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	✓

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CODEC LSIs

PCM CODEC

(LAPIS Semiconductor products)

Multifunction 2ch PCM CODEC													
Part No.	PCM Sign			Channel Number	Supply Voltage(V)	PCM Synchronous Type		Analog Output			Notes	Package	Halogen Free Support ^{*1}
	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 linear PCM CODEC													
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 CODEC													
MSM7717-01	✓	✓	—	1	2.7 to 3.8	✓	—	2.0Vpp	600Ω	✓	3V 1ch PCM CODEC	SSOP20	—
3V 2ch PCM CODEC													
MSM7704-01	✓	✓	—	2	2.7 to 3.8	✓	—	2.0Vpp	1.2kΩ	—	3V 2ch PCM CODEC	SOP24	✓
5V 1ch PCM CODEC													
MSM7578V	✓	✓	—	1	4.75 to 5.25	✓	—	2.4Vpp	600Ω	—	5V 1ch PCM CODEC	SOP24/SSOP20	✓
5V 2ch PCM CODEC													
MSM7533V	✓	✓	—	2	4.75 to 5.25	✓	—	3.4Vpp	600Ω	—	5V 2ch PCM CODEC	SOP24	✓

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ADPCM CODEC

(LAPIS Semiconductor products)

ADPCM CODEC Compliant with G.726									
Part No.	PCM Interface	Operating Frequency (MHz)	Supply Voltage (V)	Analog Output	Supply Current (Max.)(mA)	Operating Temperature (°C)	Note	Package	Halogen Free Support ^{*1}
ML7029	μ-Law	10.368	2.7 to 3.6	1.3Vpp, 20kΩ	12	−25 to +70	ADPCM CODEC compliant with G.726	SSOP30	✓

*1: A check mark of halogen free support means that we will be able to ship out the halogen free products. For details, please inquire to the sales.

Car Communication LSIs

FM Data Broadcast Reception LSIs

(LAPIS Semiconductor products)

FM Data Reception Tuner								
Part No.	Feature	Supply Voltage (V)	Supply Current (Max.)(mA)	Operating Temperature (°C)	Package	Halogen Free Support ^{*1}	Automotive Grade ^{*2}	
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	85	−40 to +85	WQFN64	✓	YES	
ML7183[J]	FM VICS [®] tuner & Filter LSI, BPF, I ² C slave	3.0 to 3.6	75	−40 to +85	WQFN64	✓	YES	
FM Multiplexing Demodulate for VICS [®]								
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	28	−40 to +85	WQFN64	✓	YES	
FM Multiplexing Demodulate for DARC [®]								
MSM9563	FM multiplexing demodulate LSI for DARC [®] , BPF&frame memory built-in, Frames A,B,C, 8bit BUS interface	3.0 to 3.6	28	−40 to +85	QFP44	✓	YES	

[J]: This LSI is limited to the market in Japan.

 VICS[®] is a registered trademark of Vehicle Information and Communication System Center.

 DARC[®] is a registered trademark of NHK Engineering System, Inc..

*1: A check mark of halogen free support means that we will be able to ship out the halogen free products. For details, please inquire to the sales.

*2: Please inquire to the sales for AEC-Q100.