

LANSDALE *Semiconductor Inc.*



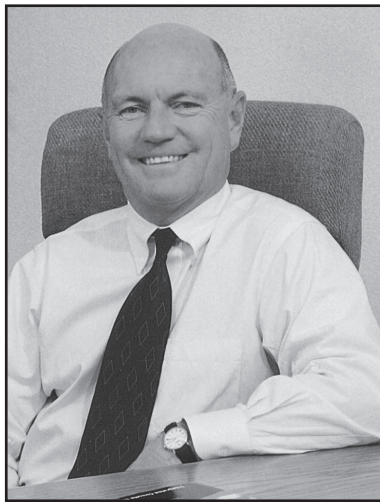
Today's Technology Tomorrow ®

*Wireless IC
Short Form Catalog*

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A Message From The President . . .



After manufacturing mission-critical, hi-rel military and commercial semiconductors for over 40 years, Lansdale Semiconductor has now expanded its product offerings by manufacturing some of the electronic component industry's most popular, and in demand, RF and wireless integrated circuits (ICs). This data book contains comprehensive data sheets and applications information on all of the new communications ICs being produced at Lansdale. But first, I'd like to introduce you to Lansdale with a brief company history, including our beginnings, our growth, and our development into an industry leader.

Our company was founded in 1964 to supply aftermarket germanium transistor product lines from the Philco-Ford Company in Lansdale, PA. We relocated our headquarters and manufacturing facilities to Phoenix, AZ in 1976, after acquiring a major product line from Motorola. As the "semiconductor aftermarket" pioneer, Lansdale recognized the critical need for a long term manufacturing and supply source within the global IC industry and implemented a strategic plan to fill that need by acquiring a series of mature IC product lines from several of the world's leading OEM chip makers.

With commercial and military production orders, employment, and annual sales rising rapidly, Lansdale needed a new, dedicated semiconductor manufacturing facility. We decided in 1983 to purchase a 3-inch wafer fabrication facility (fab) in Santa Monica, CA. In September 1993, needing more capacity, Lansdale broke ground for a new, custom-built, 4-inch wafer fab with a class 100 clean room in Tempe, AZ, and closed the Santa Monica fab.

The Tempe wafer fab became fully operational early in the spring of 1994. Six years later we sold the Tempe fab to a group of former Intel corporate executives. Spinning off our wafer fab operations and accessing additional high-quality, high-reliability IC subcontractors has allowed Lansdale Semiconductor to focus strategic resources on expanding our commercial wireless, industrial, and military IC product lines.

Over this period of time, Lansdale has become a leading supplier of "semiconductor aftermarket" ICs. As the "semiconductor aftermarket" pioneer, Lansdale extends your product's life cycle by manufacturing electronic components that the original manufacturers no longer produce. Leading IC suppliers have chosen us to supply their products to ensure that their valued customers will continue to be supported. We are licensed to manufacture and market thousands of ICs originally designed and previously produced

by AMD, Fairchild, Freescale Semiconductor (formerly Motorola SPS), Harris, Intel, National, Philips (formerly Signetics), and Raytheon.

We have now expanded our product lines to include ICs for the wireless and RF communications markets. Key functions we support include phase locked loops (PLLs), prescalers, frequency synthesizers, transmitters, receivers, transceivers, voltage controlled oscillators (VCOs), FM subsystems, analog-to-digital converters, modems, codecs, and drivers/receivers.

Every IC is made with the original manufacturer's tooling, specifications, and performance characteristics to meet your needs for existing or new designs. Our close working relationships with the original IC manufacturers ensure identical product performance and package configurations. This means there is no need for you to go to the time or expense of designing in a replacement device, or doing a complete redesign and device qualification in your product – not when we still make 'em . . . exactly like they used to.

We have firmly established a reputation as a dependable MIL-PRF-38535 supplier to the Department of Defense (DoD) and Defense Supply Center Columbus (DSCC), as well as to an established base of commercial (ISO 9000/2000), industrial and military customers.

Lansdale Semiconductor assures you of a dependable, continuous, cost effective, and high quality source for wireless ICs today, tomorrow . . . and beyond!

You can log on to our web site at www.lansdale.com to see our most recently added wireless/RF product listings, data sheets and applications information. Lansdale has gathered a group of the best sales representatives in the industry to sell and service these products and you can locate the sales representative closest to you on our web site.



R. Dale Lillard

Important Note

This short form catalog includes device specifications and application notes that are meant to address the commercial or industrial temperature range, as originally intended by the original manufacturer. Should a wider operating temperature range and/or qualification test be necessary for your application, please consult with Lansdale Semiconductor Inc. directly to discuss your needs.

Lansdale Semiconductor Inc. has been a qualified supplier of semiconductors for over 40 years, and will continue to provide integrated circuits to support key military and defense programs.

Access Lansdale Semiconductor Information

Access Data Online

Available online are corporate, product and order information. Go to the following URL for full access:

www.lansdale.com

- Part number search
- Product summary
- Downloadable Excel part file
- Data sheets
- Application notes
- Block diagrams
- Press release articles
- Sales representative list
- Order wireless IC data book, CD, and selector guide

Lansdale Semiconductor and Pb Lead-Free Product Support

Overview

Due to increased environmental concerns around the world, semiconductor and electronic companies are now required to provide Pb Lead-Free, or “Green” products. Lansdale is committed to support this requirement by providing customers with reliable, Pb Lead-Free products.

Lansdale’s Solution

Environmental concerns have led to government regulations that make Pb Lead-Free products necessary. As a manufacturer, Lansdale can supply Pb Lead-Free product, even though it was not an option from the original manufacturer. Lansdale will support all of the products recently transferred from Motorola and Freescale in both Pb Lead-Free and Pb solder-plated lead finishes. Lansdale will distinguish between Pb Lead-Free and Pb solder-plated lead finishes with a new “MLE” prefix that designates Pb Lead-Free product. There is no additional charge for the Pb Lead-Free, RoHS-compliant product.

Support for non-Pb-Lead-Free Product

Because Lansdale has customers that do not require Pb-Lead-Free product at this time, Lansdale will continue to supply Pb solder-plated product for those customers. Lansdale believes that the Pb Lead-Free lead finish (100% Sn) we supply should be compatible with Pb solders, but that is a customer decision.

Definitions

(Pb) Lead-Free: Lead-Free semiconductors are compliant with current RoHS requirements for 6 banned substances, which include the requirement that lead not exceed 0.1% by weight in homogeneous materials.

Green: Lead-Free, free of bromine (Br) and antimony (Sb) based flame retardants, which means neither bromine nor antimony exceeds 0.1% by weight in homogeneous material.

Section 1

Wireless RF Product Offering

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Product Package Type	
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Part Number Cross Reference List

Motorola/Freescale	Lansdale	Motorola/Freescale	Lansdale	Motorola/Freescale	Lansdale
MC1350P	ML1350PP	MC13150FTA	ML13150-A9P	MC145157P2	ML145157EP
MC1350D	ML1350-5P	MC13150FTB	ML13150-B9P	MC145157DW2	ML145157-5P
MC1490P	ML1490PP	MC13155D	ML13155-5P	MC145158P2	ML145158EP
MC3356P	ML3356RP	MC13156DW	ML13156-6P	MC145158DW2	ML145158-5P
MC3356DW	ML3356-6P	MC13156FB	ML13156-8P	MC145159P1	ML145159RP
MC3371P	ML3371EP	MC13158FTB	ML13158-8P	MC145159DW1	ML145159-6P
MC3371D	ML3371-5P	MC13175D	ML13175-5P	MC145162P	ML145162EP
MC3372P	ML3372EP	MC13176D	ML13176-5P	MC145162D	ML145162-5P
MC3372D	ML3372-5P	MC33111P	ML33111EP	MC145170P2	ML145170EP
MC12002P	ML12002CP	MC33111D	ML33111-5P	MC145170D2	ML145170-5P
MC12002D	ML12002-5P	MC14469P	ML14469QP	MC145170DT2	ML145170-7P
MC12009P	ML12009EP	MC14469FN	ML14469-4P	MC145403P	ML145403RP
MC12009D	ML12009-5P	MC144110P	ML144110VP	MC145403DW	ML145403-6P
MC12011P	ML12011EP	MC144110DW	ML144110-6P	MC145404P	ML145404RP
MC120011D	ML12011-5P	MC144111P	ML144111CP	MC145404DW	ML145404-6P
MC12013P	ML12013EP	MC144111DW	ML144111-5P	MC145405P	ML145405RP
MC120013D	ML12013-5P	MC145026P	ML145026EP	MC145405DW	ML145405-6P
MC12015P	ML12015PP	MC145026D	ML145026-5P	MC145406P	ML145406EP
MC12015D	ML12015-5P	MC145027P	ML145027EP	MC145406DW	ML145406-5P
MC12016P	ML12016PP	MC145027DW	ML145027-5P	MC145407P	ML145407RP
MC12016D	ML12016-5P	MC145028P	ML145028EP	MC145407DW	ML145407-6P
MC12017P	ML12017PP	MC145028DW	ML145028-5P	MC145408P	ML145408LP
MC12017D	ML12017-5P	MC145040P	ML145040RP	MC145408DW	ML145408-6P
MC12019P	ML12019PP	MC145040DW	ML145040-6P	ML145428P	ML145428RP
MC12019D	ML12019-5P	MC145041P	ML145041RP	MC145428DW	ML145428-6P
MC12034AP	ML12034PP	MC145041DW	ML145041-6P	MC145442BP	ML145442RP
MC12034AD	ML12034-5P	MC145050P	ML145050RP	MC145442BDW	ML145442-6P
MC12038AP	ML12038PP	MC145050DW	ML145050-6P	MC145443BP	ML145443RP
MC12038AD	ML12038-5P	MC145051P	ML145051RP	MC145443BDW	ML145443-6P
MC12040P	ML12040-CP	MC145051DW	ML145051-6P	MC145488FN	ML145488-4P
MC12040FN	ML12040-4P	MC145053P	ML145053CP	MC145502P	ML144502WP
MC12052AD	ML12052-5P	MC145053D	ML145053-5P	MC145502FN	ML145502-4P
MC12054AD	ML12054A-5P	MC145106P	ML145106VP	MC145503P	ML144503EP
MC12061P	ML12061EP	MC145106DW	ML145106-6P	MC145503DW	ML144503-5P
MC12079P	ML12079PP	MC145145P2	ML145145VP	MC145505P	ML144505EP
MC12079D	ML12079-5P	MC145145DW2	ML145145-6P	MC145505DW	ML144505-5P
MC12149D	ML12149-5P	MC145146P2	ML145146RP	MC145506P	ML145506WP
MC12179D	ML12179-5P	MC145146DW2	ML145146-6P	MC145554P	ML144554EP
MC12202D	ML12202-5P	MC145151P2	ML145151YP	MC145554DW	ML1445554-5P
MC12210D	ML12210-5P	MC145151DW2	ML145151-6P	MC145557P	ML1445557EP
MC13055P	ML13055EP	MC145152P2	ML145152YP	MC145557DW	ML1445557-5P
MC13055D	ML13055-5P	MC145152DW2	ML145152-6P	MC145564P	ML1445564RP
MC13135P	ML13135LP	MC145155P2	ML145155VP	MC145564DW	ML1445564-6P
MC13135DW	ML13135-6P	MC145155DW2	ML145155-6P	MC145567P	ML1445567RP
MC13145FTA	ML13145-9P	MC145156P2	ML145156RP	MC145567DW	ML1445567-6P
MC13146FTA	ML13146-9P	MC145156DW2	ML145156-6P	MC145583DW	ML145583-7P

Device Index

Lansdale P/N	Function	Section	Page
ML1350	Monolithic IF Amplifier, 45 MHz for use in radio & TV	2	12
ML1490	Monolithic IF Amplifier, 60 MHz for use in radio & TV	2	12
ML3356	Wide Band FSK receiver, IF amp for dig. data comm.	2	11
MC3371	Narrow band FM IF Rcvr, low power, Parallel LC	2	11
ML3372	Narrow band FM IF Rcvr, low power, dual	2	11
ML12002	Analog Mixer, diff. amplifier for hi-freq. wideband	3	15
ML12009	Prescaler: 480 MHz dual modulus $\div 5/6$	3	15
ML12011	Prescaler: 550 MHz dual modulus $\div 8/9$	3	15
ML12013	Prescaler: 550 MHz dual modulus $\div 10/11$	3	15
ML12015	Prescaler: 225 MHz dual modulus $\div 32/33$	3	15
ML12016	Prescaler: 225 MHz dual modulus $\div 40/41$	3	15
ML12017	Prescaler: 225 MHz dual modulus $\div 65/65$	3	15
ML12019	Prescaler: 225 MHz dual modulus $\div 20/21$	3	15
ML12034	Prescaler: 2.0 GHz dual modulus $\div 32/33, \div 64/65$	3	15
ML12038	Prescaler: 1.1 GHz dual modulus $\div 64/65 \div 128/129$ stby	3	15
ML12040	80 MHz Phase Freq. detector for PLL applications	3	15
ML12052	Prescaler: 1.1 GHz dual modulus $\div 64/65, \div 128/129$	3	15
ML12054A	Prescaler: 2.0 GHz dual modulus $\div 64/65, \div 128/129$	3	15
ML12061	Crystal Oscillator, 2-20 MHz for MECL & TTL outputs	3	15
ML12079	Prescaler: 2.8 GHz selectable $\div 64/128/256$	3	15
ML12149	VCO, low power hi-freq. up to 1300 MHz	3	15
ML12179	500-2800 MHz Single Channel Frequency Synthesizer	3	15
ML12202	1.1 GHz Serial Input Synthesizer	3	15
ML12210	2.5 GHz Serial Input Synthesizer	3	15
ML13055	Linear Wideband FSK Rcvr for RF Data Link	2	11
ML13135	Dual Conversion, Narrow band FM Receiver	2	12
ML13145	UHF Wideband Receiver sub-system	2	11
ML13146	Low Power DC, Transmitter for ISM band, 2.0 GHz	2	11
ML13150	Narrow band FM coiless detector, IF sub system	2	11
ML13155	Wideband IF detector, up to 300 MHz	2	11
ML13156	Wideband FSK, FM IF system for digital & analog	2	11
ML13158	Wideband FM IF subsystem, for DECT & Dig. Appl.	2	11
ML13175	UHF FM/AM Transmitter, $\div 8$	2	12
ML13176	UHF FM/AM Transmitter, $\div 32$	2	12
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ML145026	Encoder & Decoder pairs, CMOS, 2.5-18V.	5	18
ML145027	Encoder & Decoder pairs, CMOS, 4.5-18V.	5	18
ML145028	Encoder & Decoder pairs, CMOS, 4.5-18V.	5	18
ML145040	A to D Conv., 8 bit, w/serial interface, req ext clock	5	18
ML145041	A to D Conv., 8 bit, w/serial interface, has clock	5	18
ML145050	A to D Conv., 10 bit, 11 chan. reqs ext clock, CMOS	5	18
ML145051	A to D Conv., 10 bit, 11 chan. has clock, CMOS	5	18
ML145053	A to D Conv., 10 bit, 5 channel has clock, CMOS	5	18
ML145106	Programmable divider w/phase detect for CB & FM, CMOS	3	14
ML145145	4-Bit Data Bus Input PLL Freq Syn -sngl-mod.prscr	3	14
ML145146	4-Bit Data Bus Input PLL Freq Syn -dual-mod.prscr	3	14
ML145151	Parallel-Input PLL Freq. Syn. For single-mod.prscr	3	14
ML145152	Parallel-Input PLL Freq. Syn. For dual-mod.prscr	3	14
ML145155	Serial-Input PLL Freq. Syn. For single-mod.prscr	3	14
ML145156	Serial-Input PLL Freq. Syn. For Dual-mod.prscr	3	14
ML145157	Serial-Input PLL Freq. Syn. For single-mod.prscr	3	14
ML145158	Serial-Input PLL Freq. Syn. For Dual-mod.prscr	3	14
ML145159	Serial-Input PLL Freq. Syn. With Analog Phase detect.	3	14
ML145162	60 MHZ and 85 MHz Dual PLL	3	14
ML145170	Serial-Input PLL Freq. Syn. with Dual-mod.prscr	3	14
ML145403	3X5 EIA232 Driver/Receiver [5403 assy opt]	4	16
ML145404	4X4 EIA232 Driver/Receiver [5403 assy opt]	4	16
ML145405	5X3 EIA232 Driver/Receiver [5403 assy opt]	4	16
ML145406	3X3 EIA232 Driver/Receiver	4	16
ML145407	5V 3X3 EIA232 Driver/Receiver	4	16
ML145408	5X5 EIA232 Driver/Receiver [5403 assy opt]	4	16
ML145428	Data Set Interface	4	16
ML145442B	CCITT V.21 Modem (300 Baud Modem)	4	16
ML145443B	Bell 103 Modem (300 Baud Modem)	4	16
ML145488	Dual Data Link Controller (DDLC)	4	16
ML145502	22 pin pin selectable PCM Codec	4	16
ML144503	16 pin pin selectable PCM Codec	4	16
ML144505	16 pin pin selectable PCM Codec	4	16
ML145506	22 pin pin selectable PCM Codec	4	16
ML144554	16 pin mu-Law Codec	4	16
ML144557	16 pin A-Law Codec	4	16
ML145564	20 pin mu-Law Codec	4	16
ML145567	20 pin A-Law Codec	4	16
ML145583	3.3V 3X5 EIA232 Driver/Receiver	4	16

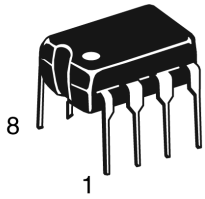
Available Package Type

Lansdale P/N	Function	Package Types	
ML1350	Monolithic IF Amplifier, 45 MHz for use in radio & TV	PDIP 8	SO 8
ML1490	Monolithic IF Amplifier, 60 MHz for use in radio & TV	PDIP 8	
ML3356	Wide Band FSK receiver, IF amp for dig. data comm.	PDIP 20	SO 20W
MC3371	Narrow band FM IF Rcvr, low power, Parallel LC	PDIP 16	SO 16
ML3372	Narrow band FM IF Rcvr, low power, dual	PDIP 16	SO 16
ML12002	Analog Mixer, diff. amplifier for hi-freq. wideband	PDIP 14	SOG 14
ML12009	Prescaler: 480 MHz dual modulus $\div 5/6$	PDIP 16	SO 16
ML12011	Prescaler: 550 MHz dual modulus $\div 8/9$	PDIP 16	SO 16
ML12013	Prescaler: 550 MHz dual modulus $\div 10/11$	PDIP 16	SO 16
ML12015	Prescaler: 225 MHz dual modulus $\div 32/33$	PDIP 8	SO 8
ML12016	Prescaler: 225 MHz dual modulus $\div 40/41$	PDIP 8	SO 8
ML12017	Prescaler: 225 MHz dual modulus $\div 65/65$	PDIP 8	SO 8
ML12019	Prescaler: 225 MHz dual modulus $\div 20/21$	PDIP 8	SO 8
ML12034	Prescaler: 2.0 GHz dual modulus $\div 32/33, \div 64/65$	PDIP 8	SO 8
ML12038	Prescaler: 1.1 GHz dual modulus $\div 64/65 \div 128/129$ stby	PDIP 8	SO 8
ML12040	80 MHz Phase Freq. detector for PLL applications	PDIP14	PLCC 20
ML12052	Prescaler: 1.1 GHz dual modulus $\div 64/65, \div 128/129$	SO8	
ML12054A	Prescaler: 2.0 GHz dual modulus $\div 64/65, \div 128/129$	SO8	
ML12061	Crystal Oscillator, 2-20 MHz for MECL & TTL outputs	PDIP 16	
ML12079	Prescaler: 2.8 GHz selectable $\div 64/128/256$	PDIP 8	SO 8
ML12149	VCO, low power hi-freq. up to 1300 MHz	SO 8	
ML12179	500-2800 MHz Single Channel Frequency Synthesizer	SO 8	
ML12202	1.1 GHz Serial Input Synthesizer	SO 16	
ML12210	2.5 GHz Serial Input Synthesizer	SO 16	
ML13055	Linear Wideband FSK Rcvr for RF Data Link	PDIP 16	SO 16
ML13135	Dual Conversion, Narrow band FM Receiver	PDIP 24	SO 24
ML13145	UHF Wideband Receiver sub-system	LQFP 48	
ML13146	Low Power DC, Transmitter for ISM band, 2.0 GHz	LQFP 24	
ML13150	Narrow band FM coiless detector, IF sub system	LQFP 24	LQFP 32
ML13155	Wideband IF detector, up to 300 MHz	SO 16	
ML13156	Wideband FSK, FM IF system for digital & analog	SO 24W	QFP 32
ML13158	Wideband FM IF subsystem, for DECT & Dig. Appl.	QFP 32	
ML13175	UHF FM/AM Transmitter, $\div 8$	SO 16	
ML13176	UHF FM/AM Transmitter, $\div 32$	SO 16	
ML14469	Addressable Transceiver	PDIP 16	PLCC 44
ML33111	Compander, low voltage	PDIP 16	SO 16

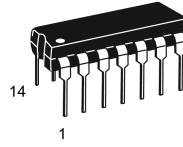
Available Package Type (cont'd)

Lansdale P/N	Function	Package Types		
ML144110	Dig. To Analog Converters, with Serial interface	PDIP 18	SO 20W	
ML144111	Dig. To Analog Converters, with Serial interface	PDIP 14	SO 16W	
ML145026	Encoder & Decoder pairs, CMOS, 2.5-18V.	PDIP 16	SO 16	
ML145027	Encoder & Decoder pairs, CMOS, 4.5-18V.	PDIP 16	SO 16	
ML145028	Encoder & Decoder pairs, CMOS, 4.5-18V.	PDIP 16	SO 16W	
ML145040	A to D Conv., 8 bit, w/serial interface, req ext clock	PDIP 20	SO 20W	
ML145041	A to D Conv. 8 bit, w/serial interface, has clock	PDIP 20	SO 20W	
ML145050	A to D Conv., 10 bit, 11 chan. reqs ext clock, CMOS	PDIP 20	SOG 20W	
ML145051	A to D Conv., 10 bit, 11 chan. has clock, CMOS	PDIP 20	SOG 20W	
ML145053	A to D Conv., 10 bit, 5 channel has clock, CMOS	PDIP 14	SOG 14	
ML145106	Programmable divider w/phase detect for CB & FM, CMOS	PDIP 18	SOG 20W	
ML145145	4-Bit Data Bus Input PLL Freq Syn -sngl-mod.prsclr	PDIP 18	SOG 20	
ML145146	4-Bit Data Bus Input PLL Freq Syn -dual-mod.prsclr	PDIP 20	SOG 20W	
ML145151	Parallel-Input PLL Freq. Syn. For single-mod.prsclr	PDIP 28	SO 28W	
ML145152	Parallel-Input PLL Freq. Syn. For dual-mod.prsclr	PDIP 28	SO 28W	
ML145155	Serial-Input PLL Freq. Syn. For single-mod.prsclr	PDIP 18	SOG 20W	
ML145156	Serial-Input PLL Freq. Syn. For Dual-mod.prsclr	PDIP 20	SOG 20W	
ML145157	Serial-Input PLL Freq. Syn. For single-mod.prsclr	PDIP 16	SOG 16	
ML145158	Serial-Input PLL Freq. Syn. For Dual-mod.prsclr	PDIP 16	SOG 16	
ML145159	Serial-Input PLL Freq. Syn. With Analog Phase detect.	PDIP 20	SOG 20W	
ML145162	60 MHZ and 85 MHZ Dual PLL	PDIP 16	SOG 16	
ML145170	Serial-Input PLL Freq. Syn. with Dual-mod.prsclr	PDIP 16	SO 16	TSSOP 16
ML145403	3X5 EIA232 Driver/Receiver [5403 assy opt]	PDIP 20	SO 20W	
ML145404	4X4 EIA232 Driver/Receiver [5403 assy opt]	PDIP 20	SO 20W	
ML145405	5X3 EIA232 Driver/Receiver [5403 assy opt]	PDIP 20	SO 20W	
ML145406	3X3 EIA232 Driver/Receiver	PDIP 16	SO 16W	
ML145407	5V 3X3 EIA232 Driver/Receiver	PDIP 20	SOG 20	
ML145408	5X5 EIA232 Driver/Receiver [5403 assy opt]	PDIP 24N	SO 24W	
ML145428	Data Set Interface	PDIP 20	SOG 20	
ML145442B	CCITT V.21 Modem (300 Baud Modem)	PDIP 20	SOG 20	
ML145443B	Bell 103 Modem (300 Baud Modem)	PDIP 20	SOG 20	
ML145488	Dual Data Link Controller (DDLCC)	PLCC 68		
ML145502	22 pin pin selectable PCM Codec	PDIP 22	PLCC 28	
ML144503	16 pin pin selectable PCM Codec	PDIP 16	SO 16W	
ML144505	16 pin pin selectable PCM Codec	P DIP 16	SO 16W	
ML145506	22 pin pin selectable PCM Codec	PDIP 22		
ML144554	16 pin mu-Law Codec	PDIP 16	SO 16W	
ML144557	16 pin A-Law Codec	PDIP 16	SO 16W	
ML145564	20 pin mu-Law Codec	PDIP 20	SO 20W	
ML145567	20 pin A-Law Codec	PDIP 20	SO 20W	
ML145583	3.3V 3X5 EIA232 Driver/Receiver	SOIC 28W		

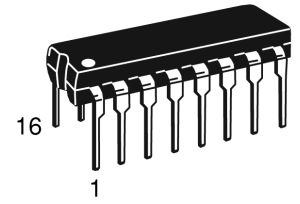
PDIP Packages



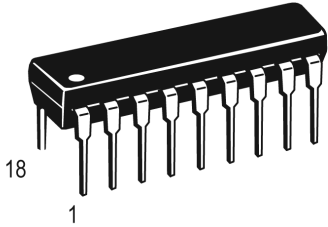
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PLASTIC PACKAGE
CASE 626



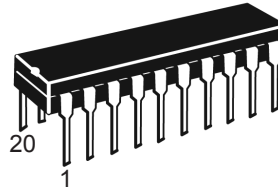
P DIP 14 = CP
PLASTIC PACKAGE
CASE 646



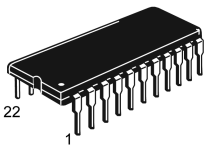
P DIP 16 = EP
PLASTIC PACKAGE
CASE 648



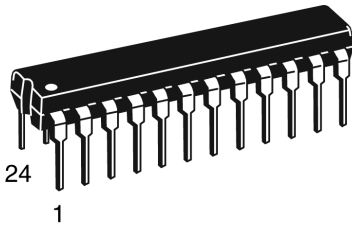
P DIP 18 = VP
PLASTIC DIP
CASE 707



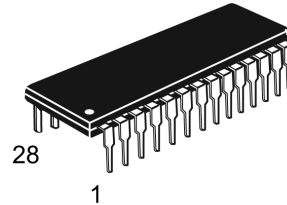
P DIP 20 = RP
PLASTIC PACKAGE
CASE 738



P DIP 22 = WP
PLASTIC DIP
CASE 708

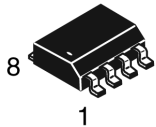


P DIP 24 = LP
PLASTIC PACKAGE
CASE 724

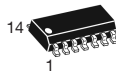


P DIP 28 = YP
PLASTIC DIP
CASE 710

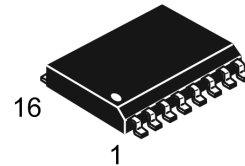
SO Packages



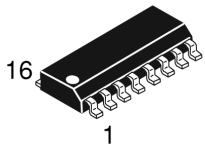
SO 8 = -5P
(SO-8)
CASE 751
PLASTIC PACKAGE



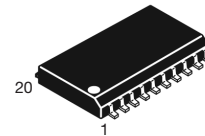
SOG 14 = -5P
SOG
CASE 751A



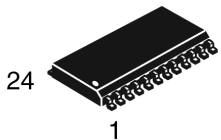
SOG 16 = -5P
SOG PACKAGE
CASE 751G



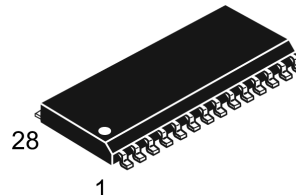
SO 16 = -5P
PLASTIC PACKAGE
CASE 751B



SOG 20W = -6P
PLASTIC PACKAGE
CASE 751D
(SO-20L)

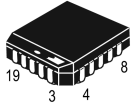


SO 24 = -6P
CASE 751E
(SO-24L)

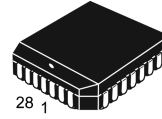


SO 28W = -5P
SOG PACKAGE
CASE 751F

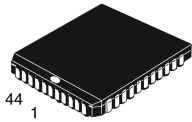
PLCC Packages



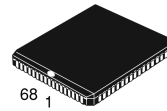
PLCC 20 = -4P
PLASTIC PACKAGE
CASE 775



PLCC 28 = -4P
PLCC PACKAGE
CASE 776

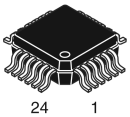


PLCC 44 = -4P
PLCC PACKAGE
CASE 777

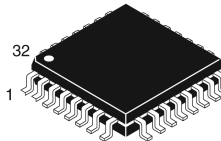


PLCC 68 = -4P
PLCC PACKAGE
CASE 779

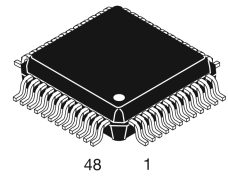
LQFP Packages



PLASTIC PACKAGE
(LQFP-24)
CASE 977

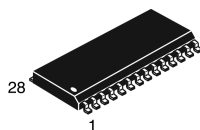


PLASTIC PACKAGE
(LQFP-32)
CASE 873

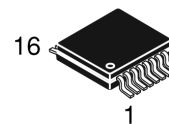


LQFP 48 = -9P
PLASTIC PACKAGE
CASE 932

Other Packages



SOIC 28W = -7P
SOG PACKAGE
CASE 751F



TSSOP 16 = -7P
PLASTIC PACKAGE
CASE 948C

Moisture Sensitivity Level and Solder Temperature

Package Type	MSL / Solder Temp	Green
PDIP 14	Not Available	260 C
PDIP 16	Not Available	260 C
PDIP 18	Not Available	260 C
PDIP 20	Not Available	260 C
PDIP 22	Not Available	260 C
PDIP 24	Not Available	260 C
PDIP 24N	Not Available	260 C
PDIP 28	Not Available	260 C
PDIP 8	Not Available	260 C
PLCC 20	Not Available	260 C
TSSOP 16	Not Available	260 C
PLCC 28	MSL 1 @ 225 C	260 C
PLCC 44	MSL 1 @ 225 C	260 C
PLCC 68	MSL 3 @ 250 C	260 C
QFP 32	MSL 3 @ 235 C	260 C
SO 16	MSL 1 @ 240 C	260 C
SO 16W	MSL 2 @ 240 C	260 C
SO 20W	MSL 3 @ 240 C	260 C
SO 24	MSL 3 @ 240 C	260 C
SO 24W	MSL 3 @ 240 C	260 C
SO 28W	MSL 3 @ 235 C	260 C
SO 8	MSL 2 @ 235 C	260 C
SOG 14	MSL 1 @ 240 C	260 C
SOG 16	MSL 1 @ 240 C	260 C
SOG 20	MSL 3 @ 240 C	260 C
SOG 20W	MSL 3 @ 240 C	260 C
SOIC 28W	MSL 2 @ 240 C	260 C
LQFP 24	MSL 3 @ 235 C	260 C
LQFP 32	MSL 3 @ 235 C	260 C
LQFP 48	MSL 3 @ 240 C	260 C

Section 2

RF/IF Integrated Circuits

RF/IF Amplifiers, Receivers, Transmitters, & Front-End IC's

Device	Function	Page
ML1350	IF Amplifier, 45 MHz	11
ML1490	IF Amplifier, 60 MHz	11
ML3356	IF Amplifier, Wide Band FSK Receiver	10
ML3371	FM IF Receiver, Narrow Band	10
ML3372	FM IF Receiver, Narrow Band, Dual	10
ML13055	Receiver, Wide Band FSK	10
ML13135	FM Receiver, Narrow Band, Dual	11
ML13145	UHF Receiver, Wide Band, Sub-system	10
ML13146	Transmitter, Low Power, for ISM Band	10
ML13150	FM Coiless Detector, Narrow Band, Sub-system	10
ML13155	IF Detector, Wide band	10
ML13156	FM IF Sub-system, Wide Band FSK	10
ML13158	FM IF Sub-system, Wide Band, for DECT & Dig	10
ML13175	UHF FM/AM Transmitter	10
ML13176	UHF FM/AM Transmitter	11
ML33111	Low Voltage Componder	11

Table 1. RF Front End ICs

Receiver											
Low Noise Amplifier					Mixer				Voltage Cont Osc	V _{CC} (V)	I _{CC} (mA)
Device	Gain (dB)	Noise Figure (dB)	IIP3 (dBm)	Input P1dB (dBm)	Gain (dB)	Noise Figure (dB)	IIP3 (dBm)	P1dB (dBm)			
ML13145	14	1.8	-5.0	-8.0	0	13	9.0	-1.0	Yes	2.7 to 6.5	30

Transmitter											
Low Noise Amplifier					Mixer				Voltage Cont Osc	V _{CC} (V)	I _{CC} (mA)
Device	PA GAIN (DB)	Noise Figure (dB)	IIP3 (dBm)	Output P1dB (dBm)	P ₁ FO _{ut} (dB)	Noise Figure (dB)	IIP3 (dBm)	P1dB (dBm)			
ML13146	15	-	-	8.0	15	-	10	-	Yes	2.7 to 6.5	25

NOTES: All devices operate over a wide range of RF input and IF frequencies, from dc to 2.0 GHz. Typical performance shown at 900 MHz.

Table 2. Wideband (FM/FSK) IFs

Device	V _{CC}	I _{CC}	Sensitivity (Typ)	IF	Mute	RSSI	Max Data Rate	Notes
ML13055	3-12 V	25 mA	20 μV	40 MHz	✓	✓	2.0 Mb	Wideband Data IF, includes data shaper
ML13155	3-6 V	7.0 mA	100 μA	250 MHz	-		10 Mb	Video Speed FM IF

Table 3. Wideband Single Conversion Receivers – VHF

Device	V _{CC}	I _{CC}	Sensitivity (Typ)	RF Input	IF	Mute	RSSI	Max Data Rate	Notes
ML3356	3-9 V	25 mA	30 μV	200 MHz	10.7 MHz	✓	✓	500 kb	Includes front end mixer/L.O.
ML13156	2-6 V	5.0 mA	2.0 μV	500 MHz	21.4 MHz	-			CT-2 FM/Demodulator
ML13158	2-6 V	6.0 mA							>1.2 Mb

Table 4. Narrowband Single Conversion Receivers – VHF

Device	V _{CC}	I _{CC}	12 dB SINAD Sensitivity (Typ)	RF Input	IF	Mute	RSSI	Max Data Rate	Notes
ML3371	2-8 V	6.0 mA	2.0 μV	60 MHz	455 kHz	✓	✓	>4.8 kb	RSSI
ML3372									RSSI, Ceramic Quad Detector/Resonator
ML13150	3-6 V	1.8 mA	1.0 μV	500 MHz			✓ 110 dB	>9.6 kb	Coiless Detector with Adjustable Bandwidth

Table 5. Narrowband Dual Conversion Receivers – FM/FSK – VHF

Device	V _{CC}	I _{CC}	12 dB SINAD Sensitivity (Typ)	RF Input	IF1	IF2 (Limiter In)	Mute	RSSI	Data Rate	Notes
ML13135	2–7 V	4.0 mA	1.0 μV	180 MHz	10.7 MHz	455 kHz	–	✓	4.8 kHz	Voltage buffered RSSI, LC Quad Detector

Table 6. Transmitters – AM/FM/FSK

Device	V _{CC}	I _{CC}	P _{out}	Max RF Freq Out	Max Mod Freq	Notes
ML13175	2–5 V	40 mA	8.0 dBm	500 MHz	5.0 MHz	AM/FM transmitter. Single frequency PLL f _{out} = 8 x f _{ref} , includes power down function
ML13176				1.0 GHz		f _{out} = 32 x f _{ref} , includes power down function

Table 7. IF Amplifier

Device	V _{cc}	I _{cc}	Power Gain @ 45 MHz	Power Gain @ 58 MHz	AGC Range @45 MHz	Package	Notes
ML1350	12.0 V	14 mA	Typ 50 db	Typ 50 db	< 60 db	SO 8	Wide Range AGC for use in AM Radio, Shortwave, TV, and instrumentation
ML1490	12.0 V	14 mA	Typ 50 db	Typ 50 db	< 60 db	P DIP 8	Wide Range AGC for use in AM Radio, Shortwave, TV, and instrumentation

Section 3

Phase-Locked Loop

Functions: Freq. Synthesizer, Prescalers, VCO, & Mixers

Device	Function	Page
ML12002	Analog Mixer, Diff. Amplifier, Wide Band	14
ML12009	Prescaler, Divide by 5/6	14
ML12011	Prescaler, Divide by 8/9	14
ML12013	Prescaler, Divide by 10/11	14
ML12015	Prescaler, Divide by 32/33	14
ML12016	Prescaler, Divide by 40/41	14
ML12017	Prescaler, Divide by 64/65	14
ML12019	Prescaler, Divide by 20/21	14
ML12034	Prescaler, Divide by 64/65	14
ML12038	Prescaler, Divide by 64/65, 128/129	14
ML12040	Phase Frequency Detector	14
ML12052	Prescaler, Divide by 64/65, 128/129	14
ML12054A	Prescaler, Divide by 64/65, 128/129	14
ML12061	Crystal Oscillator for MECL & TTL Outputs	14
ML12079	Prescaler, Divide by 64/128/256	14
ML12149	VCO, Low Power & High Frequency	14
ML12179	Frequency Synthesizer, Single Channel	14
ML12202	PLL Freq. Synthesizer, Serial Input	14
ML12210	PLL Freq. Synthesizer, Serial Input	14
ML145106	PLL Freq. Synthesizer, CMOS, Prog. Divider	13
ML145145	PLL Freq. Synthesizer, CMOS, 4 Bit Input, Sngl.-Mod.	13
ML145146	PLL Freq. Synthesizer, CMOS, 4 Bit Input, Dual-Mod.	13
ML145151	PLL Freq. Synthesizer, CMOS, Prog. 14 inputs, Sngl-Mod.	13
ML145152	PLL Freq. Synthesizer, CMOS, Prog. 16 inputs, Dual-Mod.	13
ML145155	Serial-Input PLL Freq. Synthesizer, CMOS, Sngl-Mod.	13
ML145156	Serial-Input PLL Freq. Synthesizer, CMOS, Dual-Mod.	13
ML145157	Serial-Input PLL Freq. Synthesizer, CMOS, Sngl-Mod.	13
ML145158	Serial-Input PLL Freq. Synthesizer, CMOS, Dual-Mod.	13
ML145159	Serial-Input PLL Freq. Synthesizer, CMOS, w/Analog Phase Detect.	13
ML145162	Universal Programmable PLL Freq. Synthesizer, CMOS, 60 MHz	13
ML145170	PLL Freq. Synthesizer, w/Serial Interface, CMOS, Program.	13

Phase-Locked Loop Components

Lansdale offers a choice of phase-locked loop components ranging from complete functional frequency synthesizers for dedicated applications to a wide selection of general purpose PLL circuit elements. Technologies include CMOS for scanners, WLANS, cordless telephones plus home and personal computers.

Table 1. PLL Frequency Synthesizers

Frequency (MHz)	Supply Voltage (V)	Nominal Supply Current (mA)	Phase Detector	Standby	Interface	Device
4 @ 5 V	4.5 to 12	6 @ 5 V	Single-ended 3-state	No	Parallel	ML145106
15 @ 5 V	3 to 9	7.5 @ 5V	Analog		ML145159	
20 @ 5 V	3 to 9	7.5 @ 5V	Single-ended 3-state, double-ended		4-Bit	ML145145
						ML145146
			Parallel		ML145151	
					ML145152	
			Double-ended			
Single-ended 3-state, double-ended	Serial	ML145155				
		ML145156				
		ML145157				
		ML145158				
60 @ 3 V	2.5 to 5.5	3 @ 3 V	Two single-ended 3-state	Yes		ML145162
100 @ 3 V 185 @ 5 V		2 @ 3 V 6 @ 5 V	Single-ended 3-state, Current source/sink	No		ML145170

Table 2. Phase-Locked Loop Functions

Device	Function
ML12002	Analog Mixer, diff. amplifier for hi-freq. wideband
ML12009	Prescaler: 480 MHz dual modulus $\div 5/6$
ML12011	Prescaler: 550 MHz dual modulus $\div 8/9$
ML12013	Prescaler: 550 MHz dual modulus $\div 10/11$
ML12015	Prescaler: 225 MHz dual modulus $\div 32/33$
ML12016	Prescaler: 225 MHz dual modulus $\div 40/41$
ML12017	Prescaler: 225 MHz dual modulus $\div 65/65$
ML12019	Prescaler: 225 MHz dual modulus $\div 20/21$
ML12034	Prescaler: 2.0 GHz dual modulus $\div 32/33, \div 64/65$
ML12038	Prescaler: 1.1 GHz dual modulus $\div 64/65 \div 128/129$ stby
ML12040	80 MHz Phase Freq. detector for PLL applications
ML12052	Prescaler: 1.1 GHz dual modulus $\div 64/65, \div 128/129$
ML12054	Prescaler: 2.0 GHz dual modulus $\div 64/65, \div 128/129$
ML12061	Crystal Oscillator, 2-20 MHz for MECL & TTL outputs
ML12079	Prescaler: 2.8 GHz selectable $\div 64/128/256$
ML12149	VCO, low power hi-freq. up to 1300 MHz
ML12179	500-2800 MHz Single Channel Frequency Synthesizer
ML12202	1.1 GHz Serial Input Synthesizer
ML12210	2.5 GHz Serial Input Synthesizer

Section 4

Telecommunication IC's

Central Switching Equipment

Device	Function	Page
ML145403	Single-Chip PCM Codec/Filter Drivers/Receivers, 3x5	15
ML145404	Single-Chip PCM Codec/Filter Drivers/Receivers, 4x4	15
ML145405	Single-Chip PCM Codec/Filter Drivers/Receivers, 5x3	15
ML145406	Single-Chip PCM Codec/Filter Drivers/Receivers, 3x3	15
ML145407	Single-Chip PCM Codec/Filter Drivers/Receivers, 3x3	15
ML145408	Single-Chip PCM Codec/Filter Drivers/Receivers, 5x5	15
ML145502	Single-Chip PCM Codec/Filter, Full Feature, 22 & 28 pin pkg.	15
ML145503	Single-Chip PCM Codec/Filter, Gen. Purpose, 16 pin pkg.	15
ML145505	Single-Chip PCM Codec/Filter, for instrument use, 16 pin pkg.	15
ML145506	Single-Chip PCM Codec/Filter, similar to 145502 plus, in 22 pin pkg.	15
ML145554	Single-Chip PCM Codec/Filter, (Mu-Law) 16 pin pkg.	15
ML145557	Single-Chip PCM Codec/Filter, (A-Law) 16 pin pkg.	15
ML145564	Single-Chip PCM Codec/Filter, (Mu-Law) 20 pin pkg.	15
ML145567	Single-Chip PCM Codec/Filter, (A-Law) 20 pin pkg.	15
ML145583	Single-Chip CMOS Transceiver, Drivers/Receivers, 3x5, 3.3V min	15

Data Communications

ML145488	Dual Data Link Controller (DDLC) (ISDN LAPD/LAPB)	15
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Integrated Voice Data

ML145428	Data Set Interface (DSI)	15
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Modems

ML145442	300 Baud Modem (CCITT V.21)	15
ML145443	300 Baud Modem (Bell 103)	15

Section 5

Miscellaneous Functions

ADCs/DACs

Device	Function	Page
ML144110	6-Bit D/A Converter with Serial Interface	17
ML144111	6-Bit D/A Converter with Serial Interface	17
ML145040	8-Bit A/D Converter with Serial Interface	17
ML145041	8-Bit A/D Converter with Serial Interface	17
ML145050	10-Bit A/D Converter with Serial Interface	17
ML145051	10-Bit A/D Converter with Serial Interface	17
ML145053	10-Bit A/D Converter with Serial Interface	17

Encoders/Decoders

Device	Function	Page
ML14469	Addressable Asynchronous Receiver/Transmitter	17
ML145026	Remote Control Encoder	17
ML145027	Remote Control Decoder	17
ML145028	Remote Control Decoder	17

Miscellaneous Functions
ADCs/DACs

Device	Function	I/O Format	Resolution	Number of Analog Channels	On-Chip Oscillator	Other Features
ML144110	DAC	Serial	6 Bits	6	-	Emitter-Follower Outputs
ML144111				4		
ML145050	ADC		10 Bits	11	-	Successive Approximation
ML145051					✓	
ML145053					5	
ML145040			8 Bits	11	-	
ML145041					✓	

Encoders/Decoders

Device Number	Function	Number of Address Lines	Maximum Number of Address Codes	Number of Data Bits	Operation
ML14469	Addressable UART	7	128	7/8	Full Duplex
ML145026	Encoder	Depends on Decoder	Depends on Decoder	Depends on Decoder	Simplex
ML145027	Decoder	5	243	4	Simplex
ML145028	Decoder	9	19,683	0	Simplex

Section 6

Applications and Product Literature

Application Notes & Related Published Articles	Page
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Application Notes by Abstract Number	19
Published Articles related to our Wireless Products	20

To locate the document on our website, enter the Abstract Note Number (AN #) or Article Number (ART #) in the search engine. These documents are considered discontinued and were created by the original manufacturer as an aid for both application and system design.

Wireless Systems Block Diagrams

Block Diagrams Using Wireless Products: Typical application uses are displayed to aid in the selection process of possible wireless interface components offered by Lansdale Semiconductor.

900 MHz ISM/Two Way Radio	21
Encoder – Decoder	22
Cordless	23
Codec	24

The full details and access to the documents listed herein can be obtained at the official Lansdale Semiconductor Inc. web site at www.lansdale.com

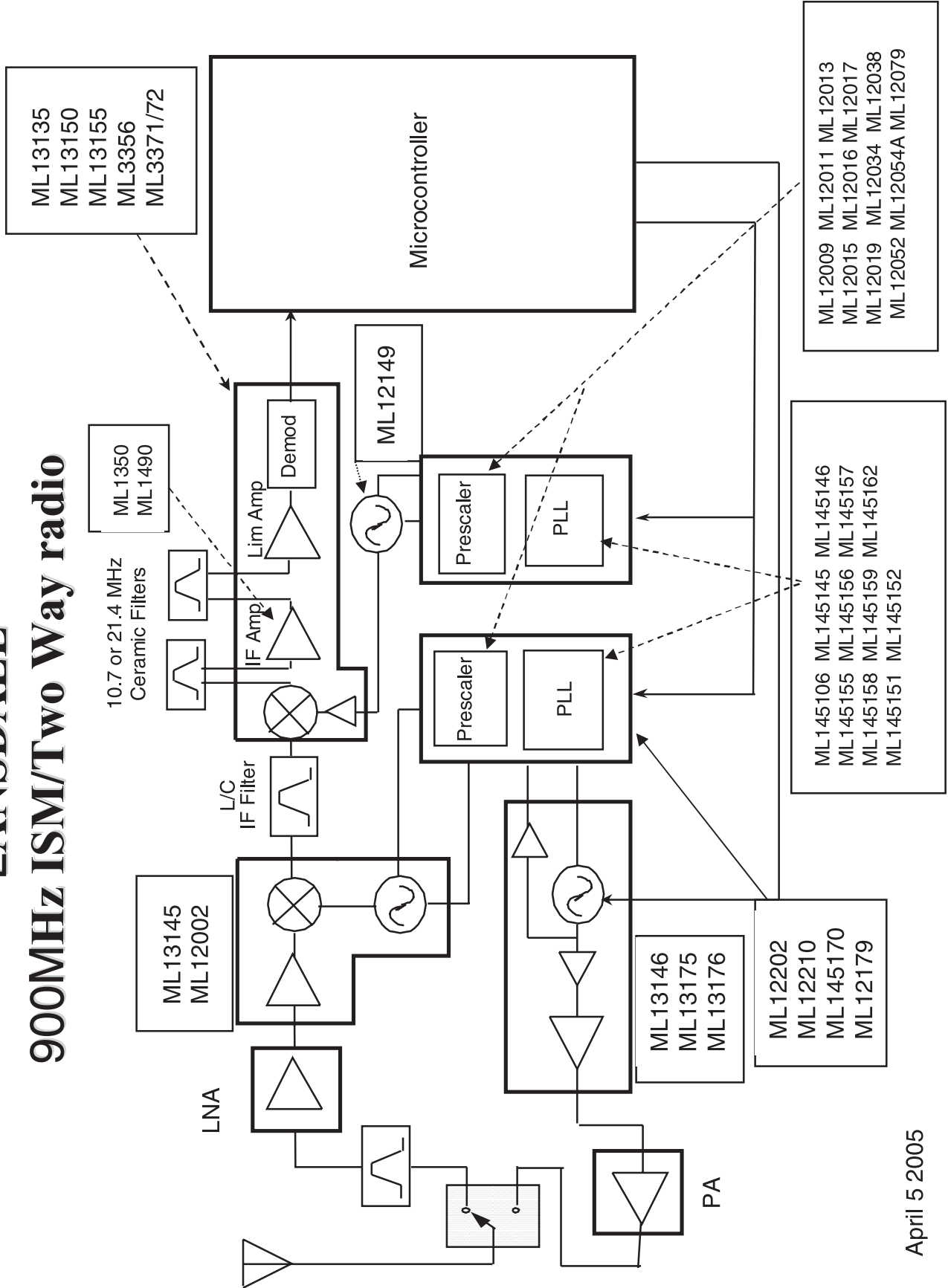
Application Notes

AN267	Matching Networks Designs with Computer Solutions
AN513	A High Gain Integrated Circuit RF-IF Amplifier with Wide Range AGC
AN535	Phase-Locked Loop Design Fundamentals
AN756	Crystal Switching Methods for MC12060/MC12061 Oscillators
AN806A	Operation of the MC14469
AN827	The Technique of Direct Programming by using a Two-Modulus Prescaler
AN943	UDLT Evaluation Board (MC145422)
AN946	Limited Distance Modem
AN969	Operation of the MC145159 PLL Frequency Synthesizer with Analog Phase Detector
AN968	A Digital Voice/Data Telephone Set
AN1062	Using the QSPI for Analog Data Acquisition
AN1207R2	The MC145170 in Basic HF and UHF Oscillators
AN1228	Interfacing the HC05 MCU to the MC145051 A/D Converter
AN1277	Offset Reference PLL's for fine Resolution or fast hopping
AN1539	An IF Communication Tutorial
AN1575	Worldwide Cordless Telephone Frequencies
AN1639	Phase Noise Measurement using the Phased Lock Technique
AN1671	MC145170 Spice Modeling Kit
AN1687	A Full-Featured Wireless Interface for RS-232 Communications
AN1691	Practical Solutions for Medium Data Rate Wireless Communications
EB_59	Predict Frequency Accuracy for MC12060 and MC12061 Crystal Oscillator Circuits
EB_60	VCO and VCXO Designs Using the MC12060 and MC12061 Oscillator Circuits

Related Published Articles

- Article 1** IC's Hidden Features Enhance Counter-Based Designs
EDN March 17, 1982
- Article 2** RF Modems - Part 1
RF DESIGN
- Article 3** RF Modems - Part 2
RF DESIGN
- Article 4** Frequency - Divider System Increases Flexibility, and Saves Parts
Electronics June 9, 1982
- Article 5** Adding to PLL Chips Functions Speed RF Synthesizer Design
Electronics October 9, 1980
- Article 6** Versatile Synthesizer Controls 140 MHz
EDN November 11, 1981

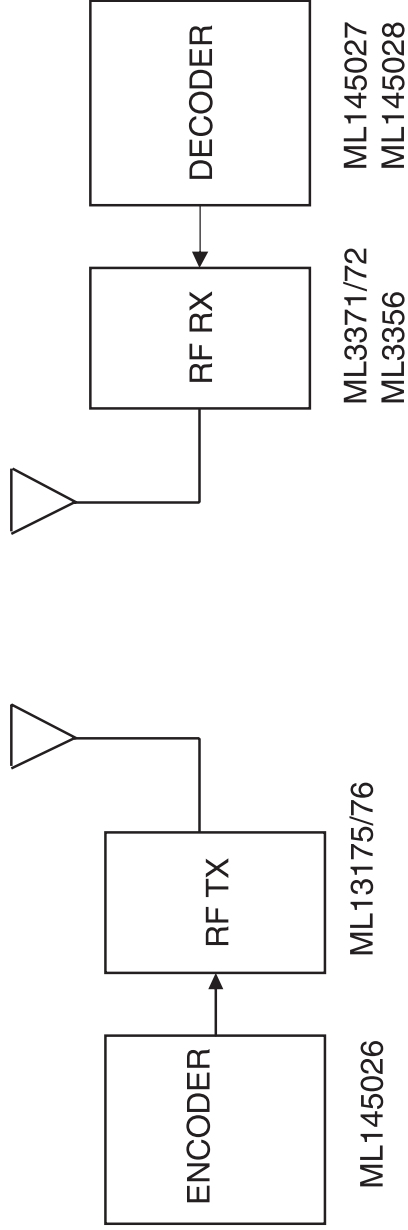
LANSDALE 900MHz ISM/Two Way radio



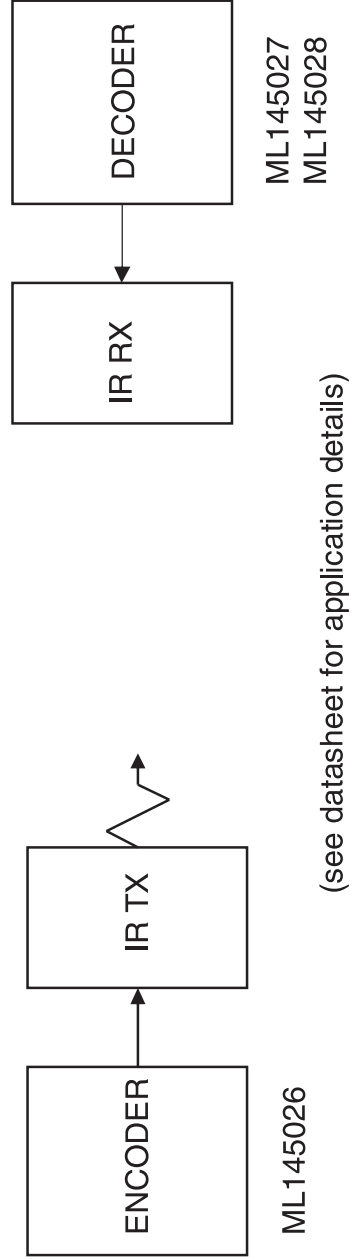
April 5 2005

LANSDALE

**SOME WIRELESS APPLICATION POSSIBILITIES ARE:
GARAGE DOOR OPENERS, SPRINKLER SYSTEMS,
AND SECURITY ALARM SYSTEMS**



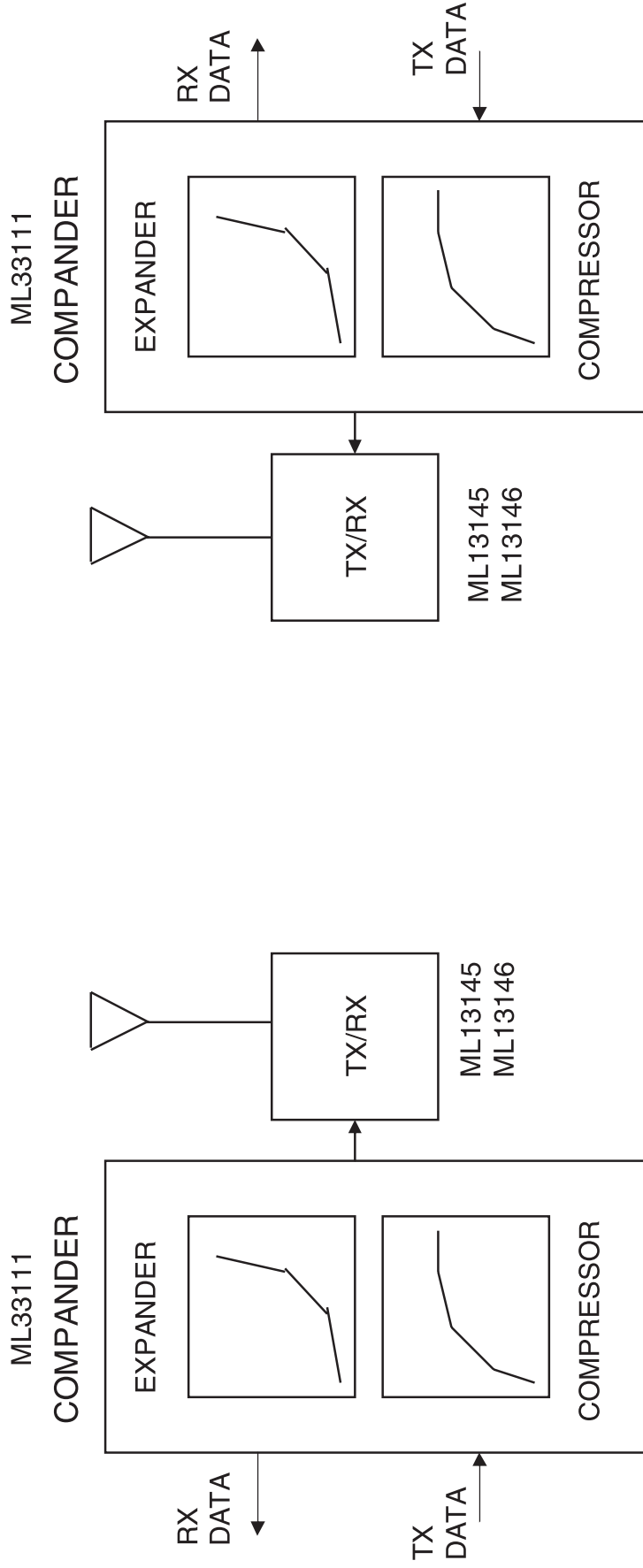
IR REMOTE-CONTROLLER TRANSMITTER/RECEIVER



(see datasheet for application details)

CORDLESS

Possible applications include cordless telephones, CBs, walkie-talkie, voice RF links, Speakerphones, voice activated intercoms, dictating machines, and any application Where an improvement in the signal to noise ratio is desired.

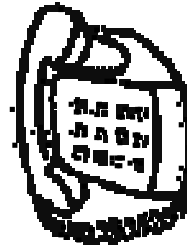


CODEC

SYNCHRONOUS AND ASYNCHRONOUS PCM CODEC

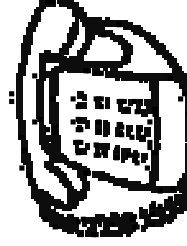


-PERFORMS VOICE DIGITIZATION
AND RECONSTRUCTION AS WELL
AS THE BAND LIMITING AND SMOOTHING
REQUIRED FOR PCM SYSTEMS



CODEC
ML145502
ML145503
ML145505
ML145506
ML145554
ML145557
ML145564
ML145567

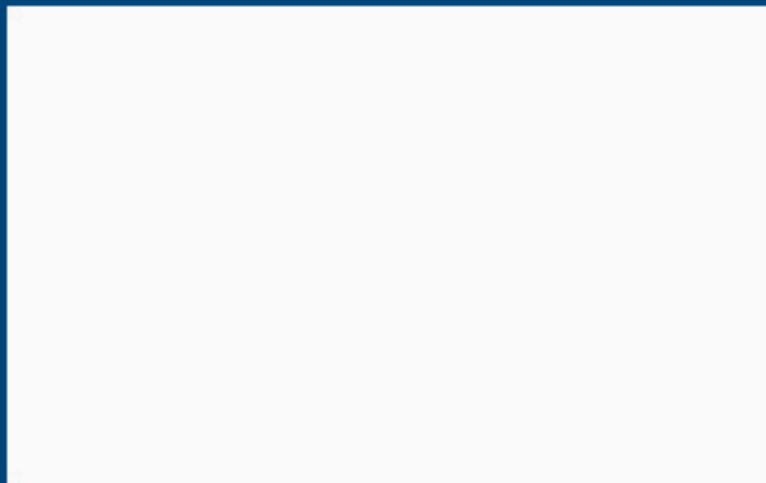
- SEE AN968 FOR FURTHER DETAILS



CODEC
ML145502
ML145503
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ML145554
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ML145564
ML145567

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