

FCC/NEED

MAR 26 1999

— FCC ID: NZI126E1075203C —
2.1033(c) LIST OF DEVICES

List of circuit devices.

REPERE	SYMBOLE	DESIGNATION	FAB.	Qté.
R121	1211602	R. 90K9 1% 1/10W 100PPM DRO 513-0 V5	VTM	1 UN
		R. 90K9 1% 1/10W 100PPM DRO D11 90K9 FCS	DRALOR	
		R. 90K9 1% 1/10W 100PPM DRO CR0603 FX 9092 E	BOURNS	
R104 R20 R21 R22 R23	1211603	R. 10K 1% 1/10W 100PPM DRO 513-0 V5	VTM	26 UN
R24 R25 R26 R27 R28				
R29 R30 R31 R32 R33				
R34 R35 R36 R37 R38				
R39 R40 R41 R42 R43				
R62		R. 10K 1% 1/10W 100PPM DRO D11 010K FCS	DRALOR	
		R. 10K 1% 1/10W 100PPM DRO CR0603 FX 1002 E	BOURNS	
		R. 18K7 1% 1/10W 100PPM DRO 513-0 V5	VTM	1 UN
R79	1211604	R. 18K7 1% 1/10W 100PPM DRO D11 18K7 FCS	DRALOR	
		R. 18K7 1% 1/10W 100PPM DRO CR0603 FX 1872 E	BOURNS	
R130 R59 R60 R61 R63	1211605	R. 100K 1% 1/10W 100PPM DRO 513-0 V5	VTM	19 UN
R64 R65 R66 R67 R68				
R69 R70 R71 R72 R73				
R74 R75 R77 R78				
		R. 100K 1% 1/10W 100PPM DRO D11 100K FCS	DRALOR	
		R. 100K 1% 1/10W 100PPM DRO CR0603 FX 1003 E	BOURNS	
R57 R58	1211607	R. 274K 1% 1/10W 100PPM DRO 513-0 V5	VTM	2 UN
		R. 274K 1% 1/10W 100PPM DRO D11 274K FCS	DRALOR	
		R. 274K 1% 1/10W 100PPM DRO CR0603 FX 2743 E	BOURNS	
R98	1211608	R. 9K09 1% 1/10W 100PPM DRO D11 9K09 FCS	DRALOR	1 UN
		R. 9K09 1% 1/10W 100PPM DRO 513-0 V5	VTM	
		R. 9K09 1% 1/10W 100PPM DRO CR0603 FX 9091 E	BOURNS	
R114 R115	1231619	R. 4H7 5% 1/10W 400PPM D11 04R7 JS	DRALOR	2 UN
		R. 4H7 5% 1/10W 400PPM 513-0 V5	VTM	
R126 R127	1231621	R. 100H 5% 1/10W 200PPM D11 100R JS	DRALOR	2 UN
		R. 100H 5% 1/10W 200PPM CR0603 JW 101 E	BOURNS	
		R. 100H 5% 1/10W 200PPM 513-0 V5	VTM	
R119	1231623	R. 220H 5% 1/10W 200PPM D11 220R JS	DRALOR	1 UN
		R. 220H 5% 1/10W 200PPM CR0603 JW 221 E	BOURNS	
		R. 220H 5% 1/10W 200PPM 513-0 V5	VTM	
R55 R56	1231624	R. 47H 5% 1/10W 200PPM CR0603 JW 470 E	BOURNS	2 UN
		R. 47H 5% 1/10W 200PPM D11 047R JS	DRALOR	
		R. 47H 5% 1/10W 200PPM 513-0 V5	VTM	

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Document vérifié par:
Philippe TESSIERNOMENCLATURE
NOA075203BFA

Date ou Avis 9914

EMETTEUR TD 26E1075203BFA

REPERE	SYMBOLE	DESIGNATION	FAB.	Qté.
R116	1231628	R. 33H 5% 1/10W 200PPM D11 033R JS CHIP0603	DRALOR	1 UN
		R. 33H 5% 1/10W 200PPM CR0603 JW 330 E CHIP0603	BOURNS	
		R. 33H 5% 1/10W 200PPM 513-0 V5 CHIP0603	VTM	
R11 R12	1231629	R. 39H 5% 1/10W 200PPM D11 039R JS CHIP0603	DRALOR	2 UN
		R. 39H 5% 1/10W 200PPM CR0603 JW 390 E CHIP0603	BOURNS	
		R. 39H 5% 1/10W 200PPM 513-0 V5 CHIP0603	VTM	
R46	1231636	R. 18H 5% 1/10W 200PPM D11 018R JS CHIP0603	DRALOR	1 UN
		R. 18H 5% 1/10W 200PPM CR0603 JW 180 E CHIP0603	BOURNS	
		R. 18H 5% 1/10W 200PPM 513-0 V5 CHIP0603	VTM	
R45	1231637	R. 12H 5% 1/10W 200PPM CR0603 JW 120 E CHIP0603	BOURNS	1 UN
		R. 12H 5% 1/10W 200PPM D11 012R JS CHIP0603	DRALOR	
		R. 12H 5% 1/10W 200PPM 513-0 V5 CHIP0603	VTM	
R80 R81	1231638	R. 27H 5% 1/10W 200PPM D11 027R JS CHIP0603	DRALOR	2 UN
		R. 27H 5% 1/10W 200PPM CR0603 JW 270 E CHIP0603	BOURNS	
		R. 27H 5% 1/10W 200PPM 513-0 V5 CHIP0603	VTM	
R13 R14 R15 R16	1231641	R. 470H 5% 1/10W 200PPM D11 470R JS CHIP0603	DRALOR	4 UN
		R. 470H 5% 1/10W 200PPM CR0603 JW 471 E CHIP0603	BOURNS	
		R. 470H 5% 1/10W 200PPM 513-0 V5 CHIP0603	VTM	
R107 R108 R110 R111	1231644	R. 0H 5% 1/10W JUMPER D11 000R JS CHIP0603	DRALOR	5 UN
R112		R. 0H 5% 1/10W JUMPER 513-0 V5 CHIP0603	VTM	
		R. 0H 5% 1/10W JUMPER CR0603 J/E CHIP0603	BOURNS	
R105 R106	1231646	R. 0H 5% 1/4W JUMPER D25 000R JS CHIP1206	DRALOR	2 UN
		R. 0H 5% 1/4W JUMPER CJ32-000-T CHIP1206	KYOCER	
		R. 0H 5% 1/4W JUMPER 502-0 V5 CHIP1206	VTM	
		R. 0H 5% 1/4W JUMPER CR1206 J/E CHIP1206	BOURNS	
R86 R87	1231650	R. 680H 5% 1/10W 200PPM D11 680R JS CHIP0603	DRALOR	2 UN
		R. 680H 5% 1/10W 200PPM 513-0 V5 CHIP0603	VTM	
		R. 680H 5% 1/10W 200PPM CR0603 JW 681 E CHIP0603	BOURNS	
R52 R53 R54 R82	1231652	R. 1K 5% 1/10W 200PPM 513-0 V5 CHIP0603	VTM	4 UN
		R. 1K 5% 1/10W 200PPM D11 001K JS CHIP0603	DRALOR	
		R. 1K 5% 1/10W 200PPM CR0603 JW 102 E CHIP0603	BOURNS	
R47 R48 R49 R50 R51	1231655	R. 4K7 5% 1/10W 200PPM 513-0 V5 CHIP0603	VTM	6 UN
R88		R. 4K7 5% 1/10W 200PPM D11 04K7 JS CHIP0603	DRALOR	
		R. 4K7 5% 1/10W 200PPM CR0603 JW 472 E CHIP0603	BOURNS	
R96 R97	1231659	R. 27K 5% 1/10W 200PPM D11 027K JS CHIP0603	DRALOR	2 UN

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		R. 27K 5% 1/10W 200PPM 513-0 V5	VTM	
		R. 27K 5% 1/10W 200PPM CR0603 JW 273 E	BOURNS	
		R. 1M 5% 1/10W 200PPM D11 001M J S	DRALOR	1 UN
R94	1231663	R. 1M 5% 1/10W 200PPM 513-0 V5	VTM	
		R. 1M 5% 1/10W 200PPM CR0603 JW 105 E	BOURNS	
		R. 470K 5% 1/10W 200PPM 513-0 V5	VTM	1 UN
R128	1231664	R. 470K 5% 1/10W 200PPM D11 470K J S	DRALOR	
		R. 470K 5% 1/10W 200PPM CR0603 JW 474 E	BOURNS	
		R. 56H 5% 1/10W 200PPM 513-0 V5	VTM	1 UN
R44	1231672	R. 56H 5% 1/10W 200PPM D11 056R J S	DRALOR	
		R. 56H 5% 1/10W 200PPM CR0603 JW 560 E	BOURNS	
		R. 120H 5% 1/10W 200PPM 513-0 V5	VTM	1 UN
R1	1231673	R. 120H 5% 1/10W 200PPM D11 120R J S	DRALOR	
		R. 120H 5% 1/10W 200PPM CR0603 JW 121 E	BOURNS	
		R. 2K2 5% 1/10W 200PPM 513-0 V5	VTM	3 UN
R17 R18 R19	1231678	R. 2K2 5% 1/10W 200PPM D11 02K2 J S	DRALOR	
		R. 2K2 5% 1/10W 200PPM CR0603 JW 222 E	BOURNS	
		R. 5K6 5% 1/10W 200PPM DRO 513-0 V5	VTM	2 UN
R100 R101	1231681	R. 5K6 5% 1/10W 200PPM DRO D11 05K6 J S	DRALOR	
		R. 5K6 5% 1/10W 200PPM DRO CR0603 JW 562 E	BOURNS	
		R. 6K8 5% 1/10W 200PPM 513-0 V5	VTM	2 UN
R83 R84	1231682	R. 6K8 5% 1/10W 200PPM D11 06K8 J S	DRALOR	
		R. 6K8 5% 1/10W 200PPM CR0603 JW 682 E	BOURNS	
		R. 33K 5% 1/10W 200PPM 513-0 V5	VTM	9 UN
R10 R2 R3 R4 R5 R6 R7	1231686	R. 33K 5% 1/10W 200PPM D11 033K J S	DRALOR	
R8 R9		R. 33K 5% 1/10W 200PPM CR0603 JW 333 E	BOURNS	
		R. 39K 5% 1/10W 200PPM 513-0 V5	VTM	1 UN
R120	1231687	R. 39K 5% 1/10W 200PPM D11 039K J S	DRALOR	
		R. 39K 5% 1/10W 200PPM CR0603 JW 393 E	BOURNS	
		R. 56K 5% 1/10W 200PPM 513-0 V5	VTM	1 UN
R102	1231688	R. 56K 5% 1/10W 200PPM D11 056K J S	DRALOR	
		R. 56K 5% 1/10W 200PPM CR0603 JW 563 E	BOURNS	
		R. 68K 5% 1/10W 200PPM 513-0 V5	VTM	2 UN
R103 R125	1231689	R. 68K 5% 1/10W 200PPM D11 068K J S	DRALOR	
		R. 68K 5% 1/10W 200PPM CR0603 JW 683 E	BOURNS	
R99	1231692	R. 150K 5% 1/10W 200PPM 513-0 V5	VTM	1 UN

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		R.150K 5% 1/10W 200PPM D11 150K J S	DRALOR	
		R.150K 5% 1/10W 200PPM CR0603 JW 154 E	BOURNS	
		R.270K 5% 1/10W 200PPM DRO 513-0 V5	VTM	1 UN
R85	1231695	R.270K 5% 1/10W 200PPM DRO D11 270K J S	DRALOR	
		R.270K 5% 1/10W 200PPM DRO CR0603 JW 274 E	BOURNS	
		R.270K 5% 1/10W 200PPM DRO D11 02M2 J S	DRALOR	1 UN
R122	1231703	R. 2M2 5% 1/10W 200PPM CR0603 JW 225 E	BOURNS	
		R. 2M2 5% 1/10W 200PPM CR0603 JW 475 E	BOURNS	1 UN
R117	1231706	R. 4M7 5% 1/10W 200PPM DRO D11 04M7 J S	DRALOR	
R123 R124	1240001	R. 0H11 10% 1/8W 250PPM CRS0805 0R11 TK250 ON TAPE	SRT	2 UN
R129 R92	1720159	P. 10K 20% 1/4W TS5 YJ	SFERNI	2 UN
		P. 10K 20% 1/4W 23-AR-10K	BITECH	
		P. 10K 20% 1/4W S4-J	DIPLOH	
		P. 10K 20% 1/4W 3314J-1-103E	BOURNS	
C56 C57 C58	2130290	C. 1PF 100V 0,10PF 0805 1A 1R0BAT 1A	AVX	3 UN
		C. 1PF 100V 0,10PF VJ0805 A 1R0 BXB T	VITRAM	
C45	2150073	C. 0MF47 25V 20% 1210 3C 474MAT 1A	AVX	1 UN
		C. 0MF47 25V 20% VJ1210 Y 474 MXXT	VITRAM	
C14 C15 C16 C17 C18	2150075	C. 0MF1 25V 20% 0805 3C 104MAT 1A	AVX	16 UN
C19 C20 C21 C22 C23				
C24 C25 C26 C27 C80				
C85				
		C. 0MF1 25V 20% AN122C0104MBA	LCC	
		C. 0MF1 25V 20% VJ0805 Y 104 MXXT	VITRAM	
C35 C36 C37 C38 C39	2650193	C. 1MF 16V 20% T 491 A 105 M 016 AS TR	KEMET	8 UN
C40 C41 C90				
		C. 1MF 16V 20% B45196-E3105-M109	SIEMEN	
		C. 1MF 16V 20% TAJ A 105 M 016 R	AVX	
		C. 1MF 16V 20% CTC3 105 XO 016 A 2T	SPRAGU	
C30 C31 C32 C33 C34	2650195	C. 4MF7 10V 20% T 491 B 475 M 010 AS TR	KEMET	6 UN
C94				
		C. 4MF7 10V 20% B45196-E2475-M209	SIEMEN	
		C. 4MF7 10V 20% TAJ B 475 M 010 R	AVX	
		C. 4MF7 10V 20% CTC3 475 XO 010 B 2T	SPRAGU	
C69	2650201	C. 10MF 6V3 20% T 491 B 106 M 006 AS TR	KEMET	1 UN
		C. 10MF 6V3 20% B45196-E1106-M209	SIEMEN	
		C. 10MF 6V3 20% TAJ B 106 M 006 R	AVX	

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REPERE	SYMBOLE	DESIGNATION	FAB.	Qté.
C61 C62 C63 C64 C65	2650205	C. 10MF 6V3 20% CTC3 106 XO 06R3 B 2T	SPRAGU	
C66 C67 C68 C86		C. 100MF 10V 20% DRO T495 D 107 M 010 AS TR	KEMET	9 UN
		C. 100MF 10V 20% DRO B45197-A2107-M409	SIEMEN	
		C. 100MF 10V 20% DRO TPS D 107 M 010 R 100	AVX	
		C. 100MF 10V 20% DRO 593D 107 XO 010 D 2T	SPRAGU	
C78 C81 C82	2650206	C. 68MF 20V 20% DRO T495 X 686 M 020 AS TR	KEMET	3 UN
		C. 68MF 20V 20% DRO B45197-A4686-M509	SIEMEN	
		C. 68MF 20V 20% DRO TPS E 686 M 020 R 150	AVX	
		C. 68MF 20V 20% DRO 593D 686 XO 020 E 2T	SPRAGU	
C1 C10 C11 C12 C13 C2	214072653A	C. 330PF 50V 10% SAA072653AA CQA69897AA CHIP0603	VITRAM	14 UN
C3 C4 C5 C6 C7 C8 C9				
C93				
*	26E1076587A	CARTE TD FILTRE TOPAZE NOA076587AA		1 UN
*	26E1076890A	TDEM SOFTW.EUHF V10200 TOPAZE SPA076890AB		1 UN
L1 L2 L3 L4 L5 L6	3210665	SELF 390NH 10% 450MA LFC32TE-R39K	KOA	6 UN
		SELF 390NH 10% 450MA CM322522-R39K	SECRE	
		SELF 390NH 10% 450MA NL322522T-R39K	TDK	
L18 L19	3210675	SELF 10MMH 5% 150MA LFC32TE-100J	KOA	2 UN
		SELF 10MMH 5% 150MA NL322522T-100J	TDK	
L7	3210778	SELF 82NH 10% 1A 1008CS-820XKBC	COLICR	1 UN
L11	3210785	SELF 220NH 5% 500MA 1008CS-221XJBC	COLICR	1 UN
L16	3210824	SELF 50MMH 20% 2A6 DRO PE-53634	PULSE	1 UN
L10 L8 L9	3210825	SELF 17NH5 5% DRO B06T	COLICR	3 UN
L17	3210826	SELF 100MMH 10% 720MA DRO SDR0805-101K	SECRE	1 UN
		SELF 100MMH 10% 720MA DRO SDR0805-101K	BOURNS	
L13	3210846	SELF 22MMH 20% 1A5 DRO SDR0805-220M	SECRE	1 UN
		SELF 22MMH 20% 1A5 DRO SDR0805-220M	BOURNS	
IC1	3370240	OSCILLA. 432 MHZ VCO ALL MQC403-432	MURATA	1 UN
Y1	3370310	QUARTZ 11.0592 MHZ CMS DRO TQ3330S	TQG	1 UN
MY1	3370316	OSCILLA. 13 MHZ 2.5PPM DRO TCO-987	TOYOCO	1 UN
Y2	3370321	QUARTZ 4.9152 MHZ CMS DRO TQ3316S	TQG	1 UN
		BFG520 O.T. MARQ.N36 SOT.143	PHILIP	1 UN
Q7	4150016	TRANS. 2N7002	MOTA	1 UN
Q10	4260039	TRANS. 2N7002LT1 MARQ.702 SOT.23	TEMIC	1 UN
		TRANS. 2N7002 MARQ.72 SOT.23	TEMIC	
Q9	4260048	TRANS. MMDFC02HD DRO MS-012.8	MOTA	1 UN
		TRANS. SI9928DY DRO MS-012.8	TEMIC	

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14-05-98

REPERE	SYMBOLE	DESIGNATION	FAB.	Qté.
D2	4310179	DIODE SCHOTTKY SMS1526-30	ALPHA1	1 UN
		DIODE SCHOTTKY MA4CS103A	MACCOM	
		DIODE SCHOTTKY BAS125	SIEMEN	
		DIODE SCHOTTKY HSMS-2810L31	HP	
DS1 DS2	4330106	DIODE ELECTROLUM. HSMG-C650	HP	2 UN
		DIODE ELECTROLUM. LN1351C-(TR)	ROE	
D3 D4 D5	4340141	DIODE REDRESS. 15MQ040	IR	3 UN
D1	4340142	DIODE PIN SMP1320-004	ALPHA1	1 UN
IC23	4600106	C.INT. LP2951CM	NS	1 UN
IC3 IC4	4600149	C.INT. MAX8863TEUK-T	MAXIM	2 UN
IC24	4600153	C.INT. LTC1148HVCS	LINEAR	1 UN
Q8	4600157	C.INT. LT1376IS8	LINEAR	1 UN
A2	4621497	C.INT. MAR-6SM	MINICI	1 UN
IC10	4621820	C.INT. MSA-0686-TR1	HP	
A3 A4 A5 A6 A7	4621914	C.INT. SS173K222AL-IH	SILSYS	1 UN
IC13 IC14 IC15 IC16	4621936	C.INT. LMC6482IM	NS	5 UN
IC2	4621939	C.INT. MAX483ESA	MAXIM	4 UN
A1	4622006	C.INT. LMX1511TM	NS	1 UN
IC11	4622059	C.INT. AD822AR	ANALOG	1 UN
		C.INT. MAX708ESA	MAXIM	1 UN
IC21	4622080	C.INT. ADM708AR	ANALOG	
IC8	4622082	C.INT. FX579D4	CML	1 UN
IC5 IC6 IC7	4622109	C.INT. M67799HA	MITSUB	1 UN
IC20	4622115	C.INT. MAX323EUA	MAXIM	3 UN
IC12	4622119	C.INT. AT89S8252-24A1	ATMEL	1 UN
IC17 IC18	4622120	C.INT. MC74HC244ADT	MOTA	1 UN
IC19	4650146	C.INT. SN74HC373PW	TEXAS	2 UN
\$ P2 P3 P4	5011283	MEMOIR. TC55257BFL-10L	TEXAS	
J1 J2 J3 J4	5050213	MEMOIR. CKX5T8257BM-12LX	TOSHIB	1 UN
*	5050263	CONNEC. 7C.477-2845-1-07-400 DRO	SONY	
\$ P1	5060431	EMBASE COAXI.N DROI.A PLATI. DRO	PRONER	1,5 UN
*	5330001	REPART. BROCH.36C.DROI.PAS 2,54	RADIAL	4 UN
		FUSIBL. 3A15 5 X20	RADIAL	1 UN
		FUSIBL. 3A15 5 X20	BERG	0,2 UN
		FUSIBL. 3A15 5 X20	FERRAZ	1 UN
		FUSIBL. 3A15 5 X20	CEHESS	

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REPERE	SYMBOLE	DESIGNATION	FAB.	Qté.
*	679075202B	C.I.EMETTEUR TD TOPAZE DRO CIB075202BA	ARMORE	1 UN
*	7810061	ETIQUET. DAT-27-619-10 19MMX6,4MM POLYESTER EN PLANCH.DE10000	BRADY	1 UN
*	7910215	CORDE DIA.3MM NEOPRENE CELLULAIRE NOIR ETANCHE	SOREDI	0,5 MT
*	7910224	BAGUE BS AS2,55 DRO	LJF	9 UN
*	722076352A	CORPS TD EMISSION TOPAZE PUB076352AC		1 UN
*	724076286A	DISSIPATEUR TD EMISSION TOPAZE PUB076286AB		1 UN
*	745076735A	ETIQUETTE IDENTIF. TDEM TOPAZE PDA076735AA		1 UN
*	8010031	FREINFILET NORMAL 242 BLEU CLAIR FLACON 50ML	LOCTIT	0,003 UN
*	8030060	RESINE RHODORSI.ROUG.COLL.CPTS 401 CAFT037 TUBE MET. 100GR	RHONEP	0,003 UN
*	8030082	ADHESIF CYANOACRYLATE 401 FLACON 20GR	LOCTIT	0,003 UN
*	9320559	VIS CS IMPERD.M 4 X 12 M ALLIAG.INOX ARCAP AP1D	ACME	4 UN
*	9320576	VIS CBLZ M 2,5X 6 INOX A4/70 CL.6G MATRICEE	STOCKI	4 UN
		VIS CBLZ M 2,5X 6 INOX A4/70 CL.6G MATRICEE	FILA	
		VIS CBLZ M 2,5X 6 INOX A4/70 CL.6G MATRICEE	BD	
*	9320610	VIS CBLZ M 3 X 6 INOX A4/70 CL.6G MATRICEE	STOCKI	4 UN
		VIS CBLZ M 3 X 6 INOX A4/70 CL.6G MATRICEE	FILA	
		VIS CBLZ M 3 X 6 INOX A4/70 CL.6G MATRICEE	BD	
*	9320613	VIS CBLZ M 2,5X 20 INOX A4/70 CL.6G MATRICEE	STOCKI	9 UN
		VIS CBLZ M 2,5X 20 INOX A4/70 CL.6G MATRICEE	FILA	
		VIS CBLZ M 2,5X 20 INOX A4/70 CL.6G MATRICEE	BD	
*	9920029	RONDEL.ONDULEE DIA.2,5 INOX A4/70 TYPE B NF E27-620	STOCKI	4 UN
		RONDEL.ONDULEE DIA.2,5 INOX A4/70 TYPE B NF E27-620	FILA	
		RONDEL.ONDULEE DIA.2,5 INOX A4/70 TYPE B NF E27-620	BD	
		RONDEL.ONDULEE DIA.2,5 INOX A4/70 TYPE B NF E27-620	NOMEL	
*	9920030	RONDEL.ONDULEE DIA.3 INOX A4/70 TYPE B NF E27-620	STOCKI	4 UN
		RONDEL.ONDULEE DIA.3 INOX A4/70 TYPE B NF E27-620	FILA	
		RONDEL.ONDULEE DIA.3 INOX A4/70 TYPE B NF E27-620	BD	
		RONDEL.ONDULEE DIA.3 INOX A4/70 TYPE B NF E27-620	NOMEL	
*	9920031	RONDEL.ONDULEE DIA.4 INOX A4/70 TYPE B NF E27-620	STOCKI	4 UN
		RONDEL.ONDULEE DIA.4 INOX A4/70 TYPE B NF E27-620	FILA	
		RONDEL.ONDULEE DIA.4 INOX A4/70 TYPE B NF E27-620	BD	
		RONDEL.ONDULEE DIA.4 INOX A4/70 TYPE B NF E27-620	NOMEL	
C50 C51 C52 C53 C54	K130040	C. 4PF7 50V 0,5PF 0805 5A 4R7DAT 1A CHIP0805	AVX	6 UN
C55		C. 4PF7 50V 0,5PF AN12CD0479DBA CHIP0805	LCC	
		C. 4PF7 50V 0,5PF VJ0805 A 4R7 DXAT CQA69697AA CHIP0805	VITRAM	
		C. 4PF7 50V 0,5PF 2222 861 15478 CHIP0805	PHILIP	

DSNP Confidentiel

Document vérifié par:
Philippe TESSIER

NOMENCLATURE
NOA075203BFA

Date ou Avis

REPERE	SYMBOL	DESIGNATION		FAB.	Qté.
C28 C29	K130080	C. 10PF 50V 5% 0805 5A 100JAT 1A	CHIP0805	AVX	2 UN
		C. 10PF 50V 5% AN12CD0100JBA	CHIP0805	LCC	
		C. 10PF 50V 5% VJ0805 A 100 JXAT	CQA69897AA CHIP0805	VITRAM	
		C. 10PF 50V 5% 2222 861 15109	CHIP0805	PHILIP	
C72 C73	K130130	C. 27PF 50V 5% 0805 5A 270JAT 1A	CHIP0805	AVX	2 UN
		C. 27PF 50V 5% AN12CD0270JBA	CHIP0805	LCC	
		C. 27PF 50V 5% VJ0805 A 270 JXAT	CQA69897AA CHIP0805	VITRAM	
		C. 27PF 50V 5% 2222 861 15279	CHIP0805	PHILIP	
C70 C71	K130170	C. 56PF 50V 5% 0805 5A 560JAT 1A	CHIP0805	AVX	2 UN
		C. 56PF 50V 5% AN12CD0560JBA	CHIP0805	LCC	
		C. 56PF 50V 5% VJ0805 A 560 JXAT	CQA69897AA CHIP0805	VITRAM	
		C. 56PF 50V 5% 2222 861 15569	CHIP0805	PHILIP	
C79	K130200	C. 100PF 50V 5% 0805 5A 101JAT 1A	CHIP0805	AVX	1 UN
		C. 100PF 50V 5% AN12CD0101JBA	CHIP0805	LCC	
		C. 100PF 50V 5% VJ0805 A 101 JXAT	CQA69897AA CHIP0805	VITRAM	
		C. 100PF 50V 5% 2222 861 15101	CHIP0805	PHILIP	
C83 C87 C88 C89 C92	K130220	C. 150PF 50V 5% 0805 5A 151JAT 1A	CHIP0805	AVX	5 UN
		C. 150PF 50V 5% AN12CD0151JBA	CHIP0805	LCC	
		C. 150PF 50V 5% VJ0805 A 151 JXAT	CQA69897AA CHIP0805	VITRAM	
		C. 150PF 50V 5% 2222 861 15151	CHIP0805	PHILIP	
C59 C60	K130320	C. 1000PF 50V 5% 0805 5A 102JAT 1A	CHIP0805	AVX	2 UN
		C. 1000PF 50V 5% AN12CD0102JBA	CHIP0805	LCC	
		C. 1000PF 50V 5% VJ0805 A 102 JXAT	CQA69897AA CHIP0805	VITRAM	
		C. 1000PF 50V 5% 2222 861 15102	CHIP0805	PHILIP	
C77	K130370	C. 470PF 50V 5% 0805 5A 471JAT 1A	CHIP0805	AVX	1 UN
		C. 470PF 50V 5% AN12CD0471JBA	CHIP0805	LCC	
		C. 470PF 50V 5% VJ0805 A 471 JXAT	CQA69897AA CHIP0805	VITRAM	
		C. 470PF 50V 5% 2222 861 15471	CHIP0805	PHILIP	
C42 C43 C44	K140040	C. 10000PF 50V 10% 0805 5C 103KAT 1A	CHIP0805	AVX	3 UN
		C. 10000PF 50V 10% AN12ZD0103KBA	CHIP0805	LCC	
		C. 10000PF 50V 10% VJ0805 Y 103 KXAT	CQA69897AA CHIP0805	VITRAM	
		C. 10000PF 50V 10% 2222 580 16718	CHIP0805	PHILIP	
C74 C75 C76	K140130	C. 2200PF 50V 20% 0805 5C 222MAT 1A	CHIP0805	AVX	3 UN
		C. 2200PF 50V 20% AN12ZD0222MBA	CHIP0805	LCC	
		C. 2200PF 50V 20% VJ0805 Y 222 MXAT	CQA69897AA CHIP0805	VITRAM	
		C. 2200PF 50V 20% 2222 580 16723	CHIP0805	PHILIP	
C84 C91	K140140	C. 4700PF 50V 20% 0805 5C 472MAT 1A	CHIP0805	AVX	2 UN

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Philippe TESSIER

NOA075203BF

REPERE	SYMBOLE	DESIGNATION	FAB.	Qté.
		C. 4700PF 50V 20% AN12ZD0472MBA CHIP0805	LCC	
		C. 4700PF 50V 20% VJ0805 Y 472 MXAT CQA69897AA CHIP0805	VITRAM	
C46 C47 C48 C49	K140220	C.22000PF 50V 10% 0805 5C 223KAT 1A CHIP0805	AVX	4 UN
		C.22000PF 50V 10% AN12ZD0223KBA CHIP0805	LCC	
		C.22000PF 50V 10% VJ0805 Y 223 KXAT CQA69897AA CHIP0805	VITRAM	
D6	K230020	DIODE COMMUTATION BAV70 LT1 MARQ.A4 SOT.23	MOTA	1 UN
		DIODE COMMUTATION BAV70	PHILIP	
Q1 Q2 Q3 Q4	K310040	TRANS. BC857BLT1 MARQ.3F SOT.23	MOTA	4 UN
		TRANS. BC857B MARQ.3F SOT.23	PHILIP	
Q5 Q6	K310060	TRANS. BC847BLT1 MARQ.1F SOT.23	MOTA	2 UN
		TRANS. BC847B ON TAPE MARQ.1F SOT.23	PHILIP	
IC9	K550780	C.INT. MC74HC00AD MS-012.14	MOTA	1 UN
		C.INT. TC74HC00AFN MS-012.14	TOSHIB	
		C.INT. MM74HC00M MS-012.14	NS	
		C.INT. PC74HC00D MS-012.14	PHILIP	
IC22	K550870	C.INT. MC74HC02AD MS-012.14	MOTA	1 UN
		C.INT. MM74HC02M MS-012.14	NS	
		C.INT. PC74HC02D MS-012.14	PHILIP	

FCC ID:
N2I26E1075203

2.983 (d)(6)

Active circuitry devices

LIST OF ACTIVE CIRCUITS

Ident.	Designation	symbol	Manufacturer	function
IC1	VCO 432Mhz	3370240	MURATA	UHF oscillator
MY1	VC TCXO TC0-987	3370321	TOYOCOM	13Mhz oscillator
IC23	LP2951	4600106	NS	Power voltage regulator
IC3/IC4	MAX8863TEUK-T	4500149	MAXIM	Power voltage regulator
IC24	LTC1148HVCS	4600153	LINEAR	Power voltage regulator
A2	MAR-6SM	4621497	MINICI	linear amplifier
IC10	SSI73K222AL	4621820	SILSYS	DQPSK modem
A3;A4;A5;A6;A7	LMC6482IM	4621914	NS	LF Amplifier
IC13;IC14;IC15;IC16	MAX483ESA	4621936	MAXIM	RS422 interface
IC2	LMX1511TM	4621939	NS	Frequency synthesizer
A1	AD822AR	4622006	ANALOG DEV.	LF Amplifier
IC21	FX579D4	4622080	CML	GMSK modem
IC8	M67799HA	4622082	MITSUB	Power amplifier
IC5;IC6;IC7	MAX323EUA	4622109	MAXIM	Analog switch
IC20	AT89S8252-24AI	4622115	ATMEL	Micro processor
IC12	MC74HC244	4622119	MOTOROLA	Logic buffer
IC17;IC18	MC74HC373	4622120	MOTOROLA	Logic circuit
IC19	TC55257BFL-10L	4650146	TOSHIBA	RAM



MURATA MANUFACTURING CO., LTD.

VCO SPECIFICATION

NEMQ03-1388

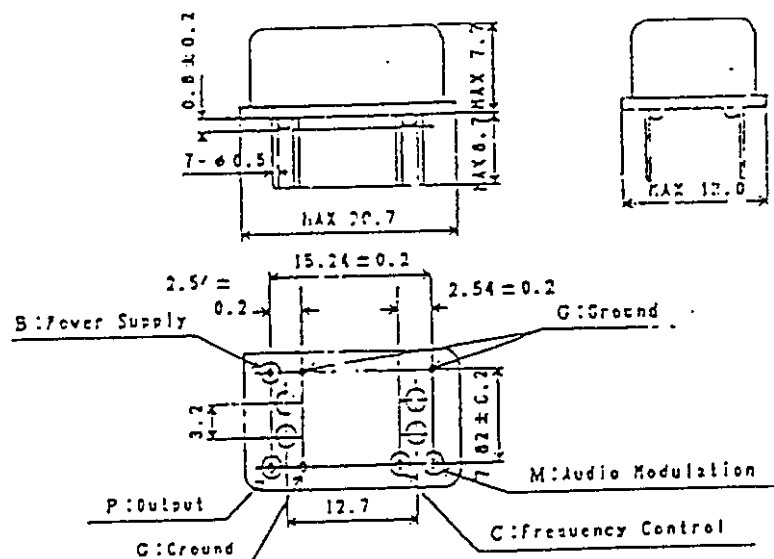
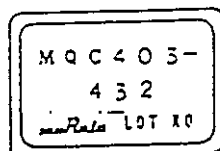
26-10, 2-CHOME, TENJIN
NAGAOKAKYO-SHI
KYOTO 617, JAPAN
PHONE: 075-951-9111
TELEX: 64270 MURATA
FAX: 075-954-7720

1. PART NUMBER HQC403-432

2. ELECTRICAL CHARACTERISTICS

2.1 Supply Voltage (V_B)	$4.0 \pm 0.2V$
2.2 Power Consumption	$\leq 10mA$ ($V_B = 4.0V$)
2.3 Operating Frequency Rang	420-445MHz
2.4 Tuning Voltage (V_C)	$+0.5 \rightarrow +3.5V$
2.5 Tuning Voltage Sensitivity	$\geq 10MHz/V$
2.6 Output level	$\geq 0dBm$ ($V_B = 4.0V$ at $25^\circ C$)
2.7 C/N	$\geq 114dBc/Hz$ (25kHz sep)
2.8 S/N	$\geq 50dB$ (without vibration)
	S level: 1kHz freq., $\pm 3kHz$ dev., 0.3-3kHz B.W.
2.9 Audio Modulation Sensitivity	$\pm 10kHz/1Vp-p$, $\pm 20\%$
2.10 Pushing Figure	$\pm 100kHz$ ($V_B = 4.0 \pm 0.2V$)
2.11 Pulling Figure	$\pm 0.3MHz$ (VSWR=2.0 for all phase)
2.12 Temperature Stability	$\pm 2.0MHz$ (at $-10 \rightarrow +60^\circ C$)
2.13 Spurious Response	$\leq -15dB$
2.14 Output Impedance	50Ω
	$-10 \rightarrow +60^\circ C$

3. DIMENSIONS



登録 REGIST		仕様書 SPEC.		名称 TITLE		仕番 SPEC. NO.	
版	年月日 DATE	作成課 SECTION	作成年月日 DATE	CRYSTAL OSCILLATOR		TN4-20608	
1	9. 3. 21	401	H9. 03. 17			頁 P. 1/8	
2		SPECIFICATION 1. MODEL NAME TCO-987C 2. ELECTRICAL SPECIFICATIONS 2.1 Output frequency : 12.8MHz ~ 16.8MHz 2.2 Supply voltage : DC + 3.0V ± 5% 2.3 Current drain : 2mA max. 2.4 Output level : 0.8Vp-p min./Clipped sinewave (DC-cut) 2.5 Harmonics : -3dBc max. 2.6 Load : (10kΩ//10pF) ± 10% 2.7 Operating temperature range : -30°C ~ +75°C 2.8 Storage temperature range : -40°C ~ +85°C 2.9 Frequency stability 2.9.1 vs. Temperature : ±2.5ppm max. / -30°C ~ +75°C (Reference at +25°C) 2.9.2 vs. Supply voltage : ±0.3ppm max. / DC+3.0V±5% 2.9.3 vs. Load : ±0.2ppm max. / (10KΩ//10pF) ±10% 2.9.4 vs. Aging : ±0.5ppm max. / year 2.10 Frequency adjustment : ±3.0ppm min. / by internal trimmer 2.11 Frequency control 2.11.1 Frequency control range : ±5ppm min. / Vcont=+1.5V±1.0V (positive slope) 2.11.2 Input impedance : 100kΩ min.					

備付

東洋通信機
技術文書

承認 APP. *[Signature]*

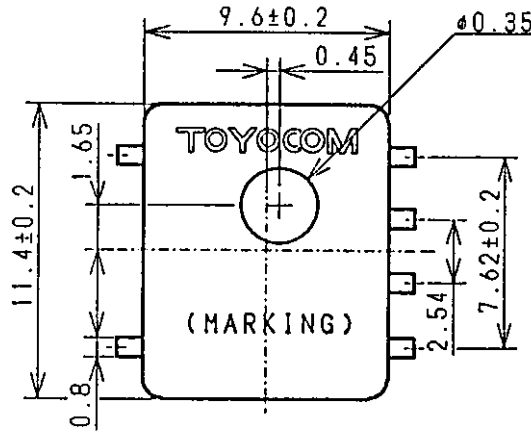
照査 CHK'D *[Signature]*

照査 CHK'D *[Signature]*

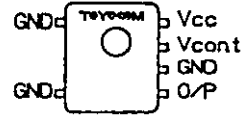
DRAW *[Signature]*

REV. NO.	1
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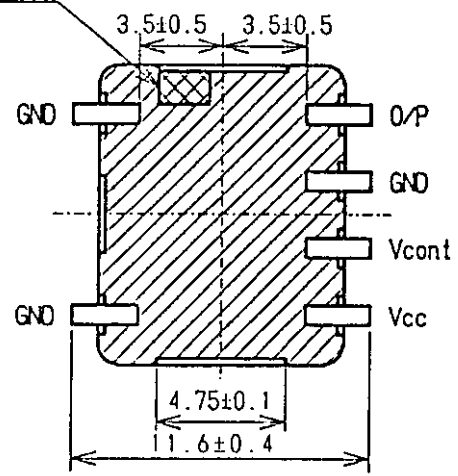
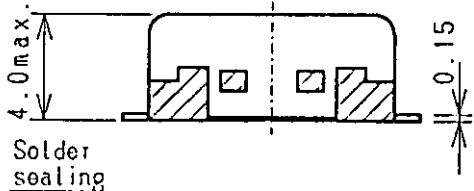
4. OUTLINE DRAWING & PIN CONECTIONS



PIN CONNECTION(TOP VIEW)



(Marking)
 MODEL NAME
 FREQUENCY [MHz]
 LOT NO. JPN.



(Material)
 CASE: SILVER-NICKEL
 PIN : SOLDER COATED
 C5191R-1/2H
 BASE: LIQUID CRYSTALLINE
 POLYMER

(size in mm)

Tolerances for all measurements are $\pm 0.1\text{mm}$ unless otherwise stated.

承認 APP.	
照査 CHK'D	
照査 CHK'D	
或 DRAW	

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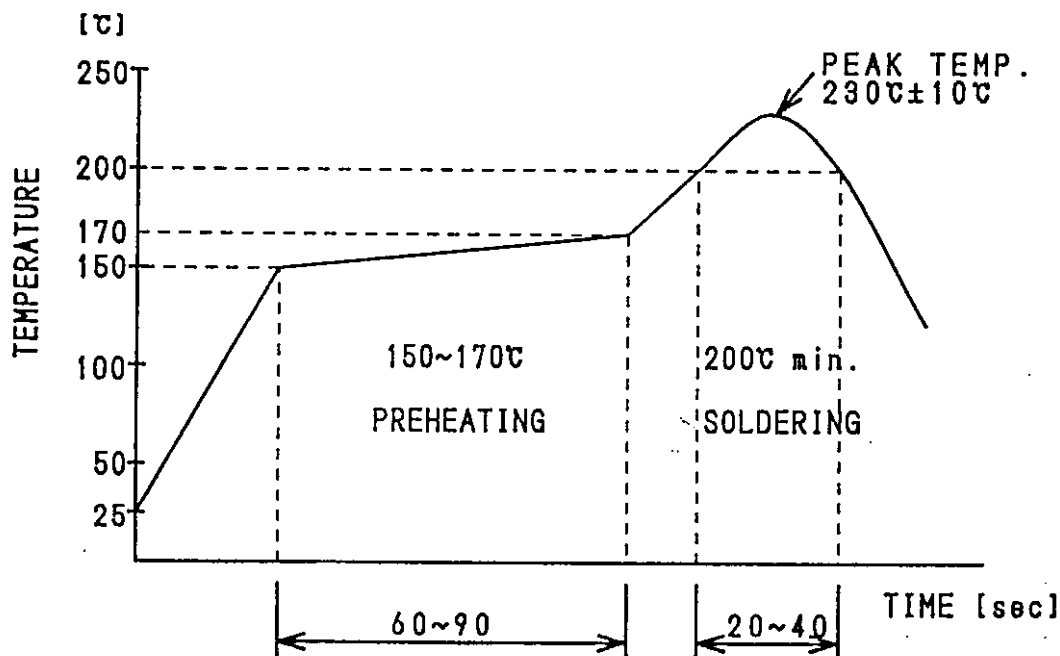
2.12 Frequency tolerance

: $\pm 0.5\text{ppm max. / Vcont} = +1.5\text{V, } +25 \pm 2^\circ\text{C}$
 (Before reflow soldering)
 : $\pm 1.5\text{ppm max. / Vcont} = +1.5\text{V, } +25 \pm 2^\circ\text{C}$
 (After reflow soldering)

※Note

In the case of frequency readjustment after reflow soldering,
 it should be made after elapsed 1 hour of soldering because of
 frequency relaxation for the thermal stress.

3. REFLOW SOLDERING PROFILE



SOLDER TEMPERATURE PROFILE (REFLOW SOLDERING)

※NOTE

This crystal oscillator uses trimmer capacitors so do not use
 solvent or ultrasonic cleaning.

承認 APP

照査 CHK'D

照査 CHK'D

DRAW

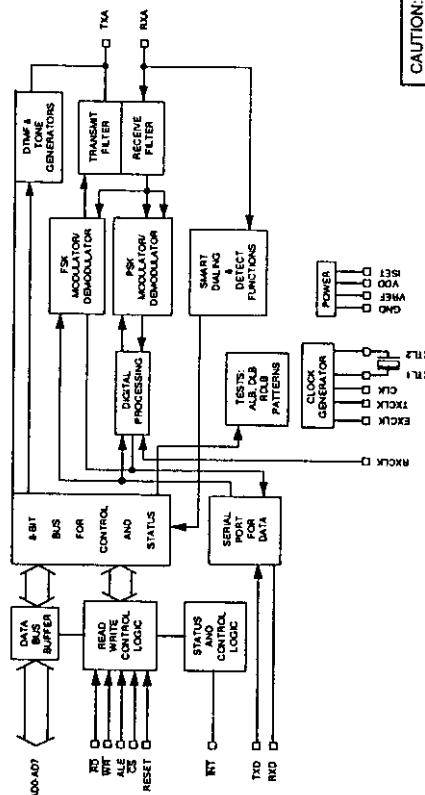
FEATURES

- One-chip CCITT V.22, V.21, Bell 212A and 103 standard compatible modem data pump
- Full-duplex operation at 0-300 bit/s (FSK) or 600 and 1200 bit/s (DPSK)
- Pin and software compatible with other SSI K-Series 1-chip modems
- Interfaces directly with standard microprocessors (8048, 80C51 typical)
- Serial or parallel microprocessor bus for control
- Serial port for data transfer
- Both synchronous and asynchronous modes of operation including V.22 extended overspeed
- Call progress, carrier, precise answer tone (2100 or 2225 Hz), and long loop detectors
- DTMF, and 550 or 1800 Hz guard tone generators
- Test modes available: ALB, DL, RDL, Mark, Space, Alternating bit patterns
- Precise automatic gain control allows 45 dB dynamic range
- CMOS technology for low power consumption using 30 mW @ 5V
- Single +5 volt supply

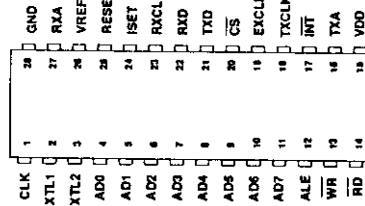
The SSI 73K222L includes the DPSK and FSK modulator/demodulator functions, call progress and handshake tone monitor and a tone generator capable of

(Continued)

BLOCK DIAGRAM



PIN DIAGRAM



CAUTION: Use handling procedures necessary for a static sensitive component.

LMX1501A/LMX1511 PLLatinum™ 1.1 GHz Frequency Synthesizer for RF Personal Communications

General Description

The LMX1501A and the LMX1511 are high performance frequency synthesizers with integrated prescalers designed for RF operation up to 1.1 GHz. They are fabricated using National's ABIC IV BiCMOS process.

The LMX1501A and the LMX1511 contain dual modulus prescalers which can select either a 64/65 or a 128/129 divide ratio at input frequencies of up to 1.1 GHz. Using a proprietary digital phase locked loop technique, the LMX1501A/11's linear phase detector characteristics can generate very stable, low noise local oscillator signals.

Serial data is transferred into the LMX1501A and the LMX1511 via a three line MICROWIRE™ interface (Data, Enable, Clock). Supply voltage can range from 2.7V to 5.5V. The LMX1501A and the LMX1511 feature very low current consumption, typically 6 mA at 3V.

The LMX1501A is available in a JEDEC 16-pin surface mount plastic package. The LMX1511 is available in a TSSOP 20-pin surface mount plastic package.

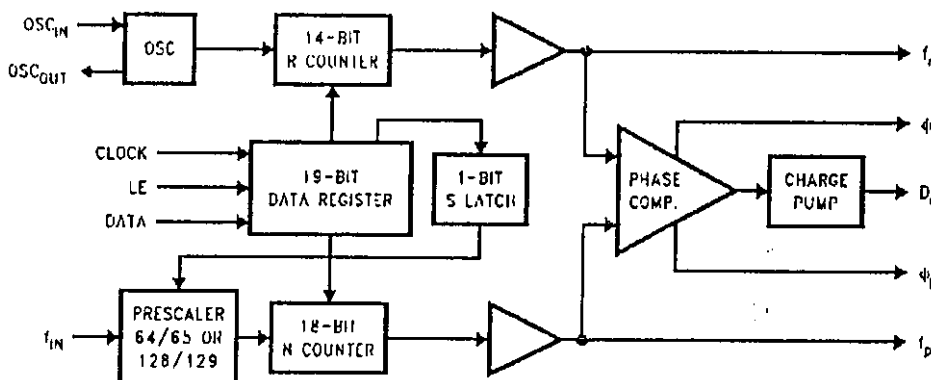
Features

- RF operation up to 1.1 GHz
- 2.7V to 5.5V operation
- Low current consumption:
 $I_{CC} = 6 \text{ mA (typ) at } V_{CC} = 3V$
- Dual modulus prescaler: 64/65 or 128/129
- Internal balanced, low leakage charge pump
- Small-outline, plastic, surface mount JEDEC, 0.150" wide, (1501A) or TSSOP, 0.173" wide, (1511) package

Applications

- Cellular telephone systems (AMPS, NMT, ETACS)
- Portable wireless communications (PCS/PCN, Cordless)
- Advanced cordless telephone systems (CT-1/CT-1+, CT-2, ISM902-928)
- Other wireless communication systems

Block Diagram

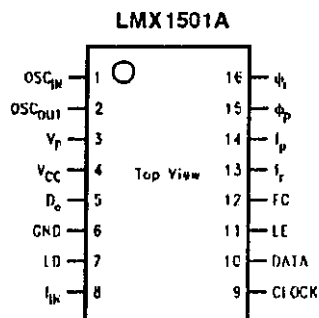


TL/W/12340-1

SCAIB Ouest
3 ter, rue de l'Hippodrome
44300 NANTES
Tél. : 40 37 00 36
Télécopieur : 40 37 01 04
Une division de SCAIB S.A.
S.A. au capital de 4.000.000

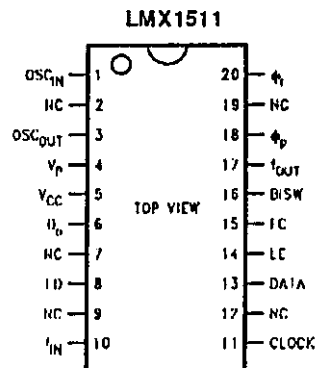
TRI-STATE® is a registered trademark of National Semiconductor Corporation.
MICROWIRE™ and PLLatinum™ are trademarks of National Semiconductor Corporation.

Connection Diagrams



TL/W/12340-2

JEDEC 16-Lead (0.150" Wide) Small Outline Molded Package (M)
Order Number LMX1501AM or LMX1501AMX
See NS Package Number M16A



TL/W/12340-3

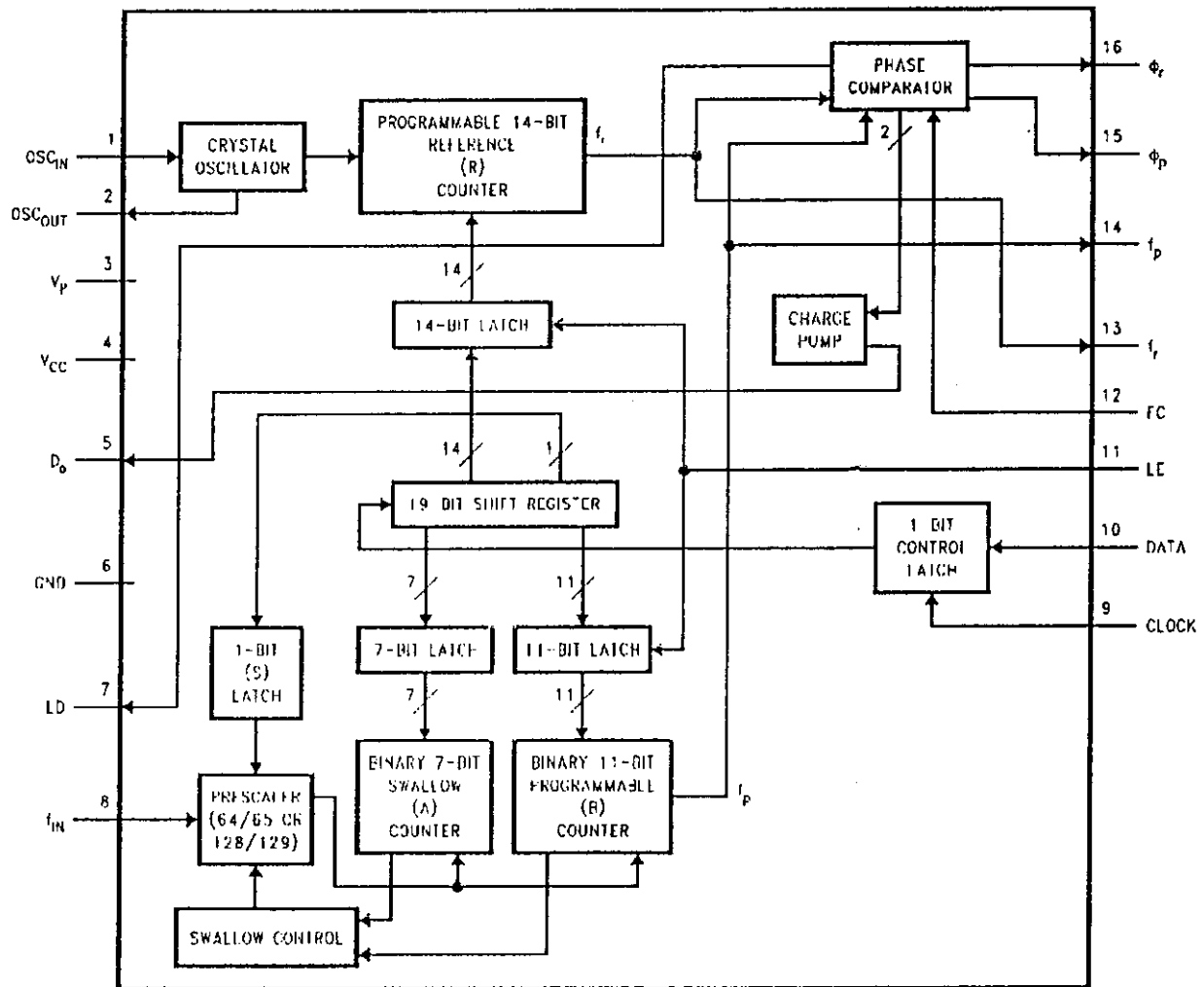
20-Lead (0.173" Wide) Thin Shrink Small Outline Package (TM)
Order Number LMX1511TM or LMX1511TMX
See NS Package Number MTC20

Pin Descriptions

Pin No.	Pin No.	Pin Name	I/O	Description
1501A	1501	1501A/1501		
1	1	OSC _{IN}	I	Oscillator input. A CMOS inverting gate input intended for connection to a crystal resonator for operation as an oscillator. The input has a $V_{CC}/2$ input threshold and can be driven from an external CMOS or TTL logic gate. May also be used as a buffer for an externally provided reference oscillator.
2	3	OSC _{OUT}	O	Oscillator output.
3	4	V _P		Power supply for charge pump must be $2 V_{CC}$.
4	5	V _{CC}		Power supply voltage input. Input may range from 2.7V to 5.5V. Bypass capacitors should be placed as close as possible to this pin and be connected directly to the ground plane.
5	6	D _O	O	Internal charge pump output. For connection to a loop filter for driving the input of an external VCO.
6	7	GND		Ground.
7	8	LD	O	Lock detect. Output provided to indicate when the VCO frequency is in "lock". When the loop is locked, the pin's output is HIGH with narrow low pulses.
8	10	I _{IN}	I	Prescaler input. Small signal input from the VCO.
9	11	CLOCK	I	High impedance CMOS Clock input. Data is clocked in on the rising edge, into the various counters and registers.
10	13	DATA	I	Binary serial data input. Data entered MSB first. LSB is control bit. High impedance CMOS input.
11	14	LE	I	Load enable input (with internal pull-up resistor). When LE transitions HIGH, data stored in the shift registers is loaded into the appropriate latch (control bit dependent). Clock must be low when LE toggles high or low. See Serial Data Input Timing Diagram.
12	15	FC	I	Phase control select (with internal pull-up resistor). When FC is LOW, the polarity of the phase comparator and charge pump combination is reversed.
X	16	BISW	O	Analog switch output. When LE is HIGH, the analog switch is ON, routing the internal charge pump output through BISW (as well as through D _O).
13		I _r	O	Monitor pin of phase comparator input. Programmable reference divider output.
14		I _p	O	Monitor pin of phase comparator input. Programmable divider output.
X	17	I _{OUT}	O	Monitor pin of phase comparator input. CMOS Output.
15	18	φ _p	O	Output for external charge pump. φ _p is an open drain N-channel transistor and requires a pull-up resistor.
16	20	φ _r	O	Output for external charge pump. φ _r is a CMOS logic output.
X	2,9,12,19	NC		No connect

Functional Block Diagram

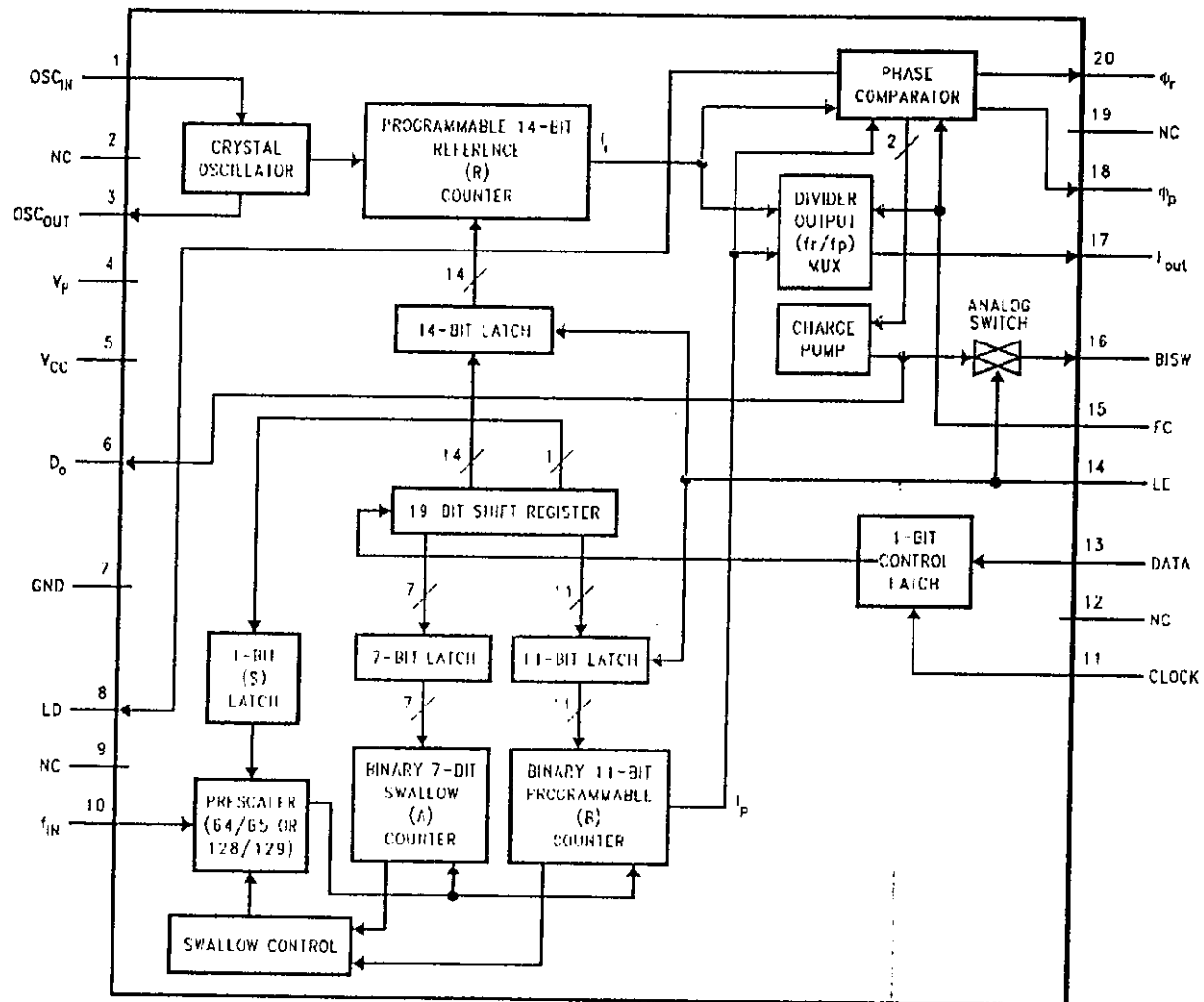
LMX1501A



TL/W/12340-40

Functional Block Diagram (Continued)

LMX1511



TL/W/12340-4

Absolute Maximum Ratings (Note 1)

If Military/Aerospace specified devices are required, please contact the National Semiconductor Sales Office/Distributors for availability and specifications.

Power Supply Voltage

V_{CC}	-0.3V to +6.5V
V_P	-0.3V to +6.5V

Voltage on Any Pin

with GND = 0V (V_I)	-0.3V to +6.5V
-------------------------	----------------

Storage Temperature Range (T_S) -65°C to +150°C

Lead Temperature (T_J) (solder, 4 sec.) +260°C

Recommended Operating Conditions

Power Supply Voltage

V_{CC}	2.7V to 5.5V
V_P	V_{CC} to 5.5V

Operating Temperature (T_A) -40°C to +85°C

Note 1: Absolute Maximum Ratings indicate limits beyond which damage to the device may occur. Operating Ratings indicate conditions for which the device is intended to be functional, but do not guarantee specific performance limits. For guaranteed specifications and test conditions, see the Electrical Characteristics. The guaranteed specifications apply only for the test conditions listed.

Electrical Characteristics $V_{CC} = 5.0V$, $V_P = 5.0V$; -40°C < T_A < 85°C, except as specified

Symbol	Parameter	Conditions	Min	Typ	Max	Units
I_{CC}	Power Supply Current	$V_{CC} = 3.0V$		6.0	8.0	mA
		$V_{CC} = 5.0V$		6.5	8.5	mA
f_{IN}	Maximum Operating Frequency		1.1			GHz
f_{OSC}	Maximum Oscillator Frequency		20			MHz
f_{ϕ}	Maximum Phase Detector Frequency		10			MHz
Pf_{IN}	Input Sensitivity	$V_{CC} = 2.7V$ to 5.5V	-10		+6	dBm
V_{OSC}	Oscillator Sensitivity	OSC_{IN}	0.5			V _{pp}
V_{IH}	High-Level Input Voltage	'	0.7 V_{CC}			V
V_{IL}	Low-Level Input Voltage	'			0.3 V_{CC}	V
I_{IH}	High-Level Input Current (Clock, Data)	$V_{IH} = V_{CC} = 5.5V$	-1.0		1.0	μA
I_{IL}	Low-Level Input Current (Clock, Data)	$V_{IL} = 0V$, $V_{CC} = 5.5V$	-1.0		1.0	μA
I_{IH}	Oscillator Input Current	$V_{IH} = V_{CC} = 5.5V$			100	μA
I_{IL}		$V_{IL} = 0V$, $V_{CC} = 5.5V$	-100			μA
I_{IH}	High-Level Input Current (LE, FC)	$V_{IH} = V_{CC} = 5.5V$	-1.0		1.0	μA
I_{IL}	Low-Level Input Current (LE, FC)	$V_{IL} = 0V$, $V_{CC} = 5.5V$	-100		1.0	μA

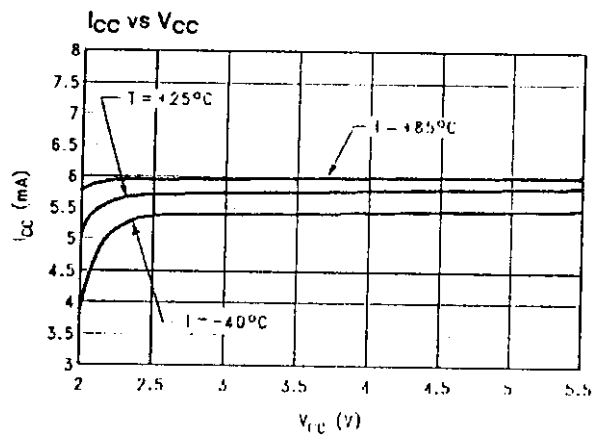
*Except I_{IN} and OSC_{IN}

Electrical Characteristics $V_{CC} = 5.0V$, $V_P = 5.0V$; $-40^{\circ}C < T_A < 85^{\circ}C$, except as specified (Continued)

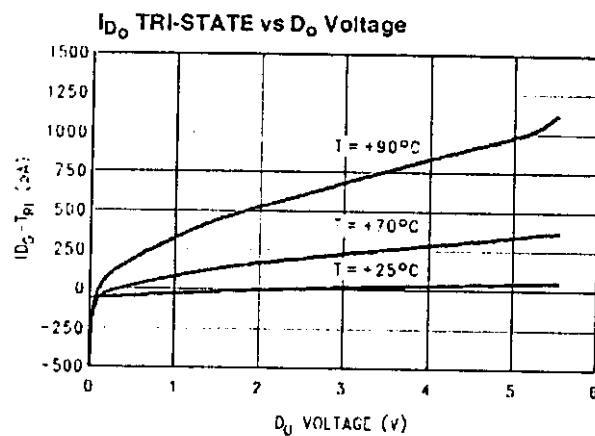
Symbol	Parameter	Conditions	Min	Typ	Max	Units
$I_{D0-source}$	Charge Pump Output Current	$V_{D0} = V_P/2$		-5.0		mA
$I_{D0-sink}$		$V_{D0} = V_P/2$		5.0		mA
I_{D0-Tri}	Charge Pump TRI-STATE® Current	$0.5V \leq V_{D0} \leq V_P - 0.5V$ $T = 25^{\circ}C$	-5.0		5.0	nA
V_{OH}	High-Level Output Voltage	$I_{OH} = -1.0 mA^{**}$	$V_{CC} - 0.8$			V
V_{OL}	Low-Level Output Voltage	$I_{OL} = 1.0 mA^{**}$			0.4	V
V_{OH}	High-Level Output Voltage (OSC _{OUT})	$I_{OH} = -200 \mu A$	$V_{CC} - 0.8$			V
V_{OL}	Low-Level Output Voltage (OSC _{OUT})	$I_{OL} = 200 \mu A$			0.4	V
I_{OL}	Open Drain Output Current (ϕ_P)	$V_{CC} = 5.0V$, $V_{OL} = 0.4V$	1.0			mA
I_{OH}	Open Drain Output Current (ϕ_P)	$V_{OH} = 5.5V$			100	μA
R_{ON}	Analog Switch ON Resistance (1511)			100		Ω
t_{CS}	Data to Clock Set Up Time	See Data Input Timing	50			ns
t_{CH}	Data to Clock Hold Time	See Data Input Timing	10			ns
t_{CWH}	Clock Pulse Width High	See Data Input Timing	50			ns
t_{CWL}	Clock Pulse Width Low	See Data Input Timing	50			ns
t_{ES}	Clock to Enable Set Up Time	See Data Input Timing	50			ns
t_{EW}	Enable Pulse Width	See Data Input Timing	50			ns

**Except OSC_{OUT}

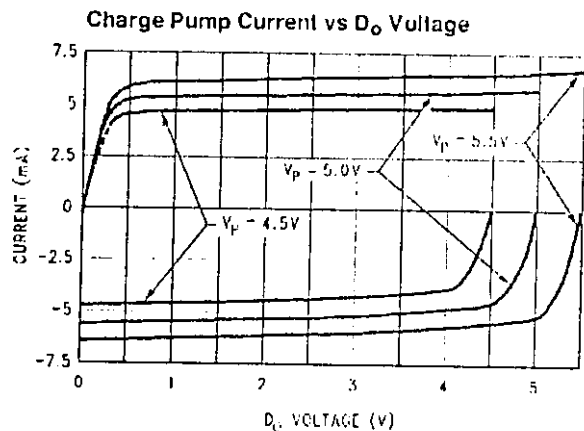
Typical Performance Characteristics



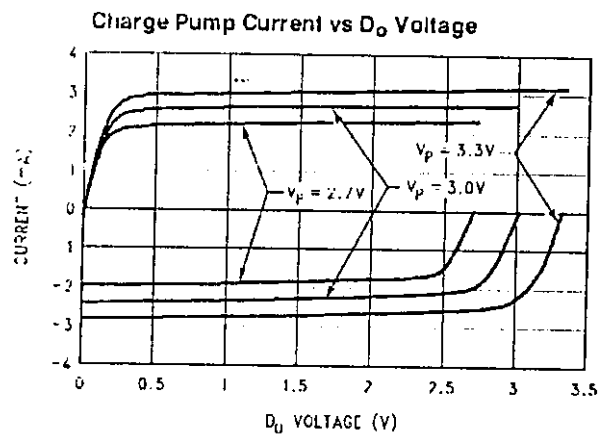
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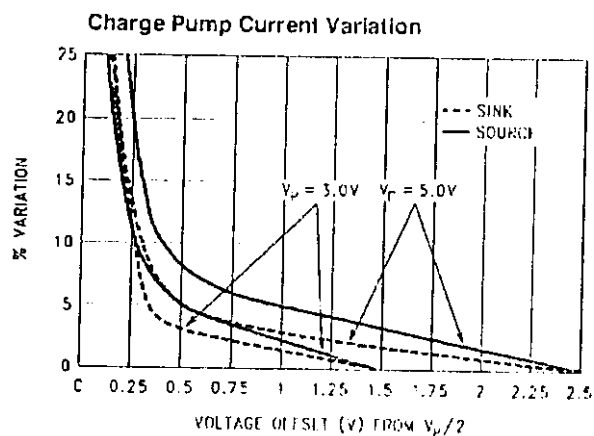
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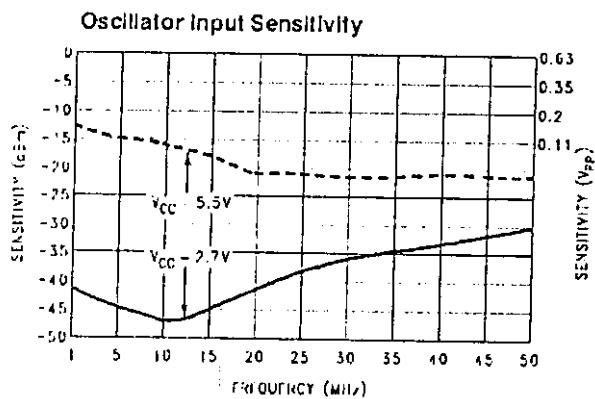
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TL/W/12340-8



TL/W/12340-9

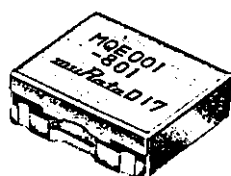


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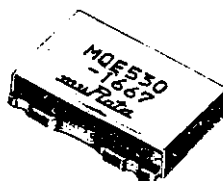
MICROWAVE OSCILLATOR

muRata

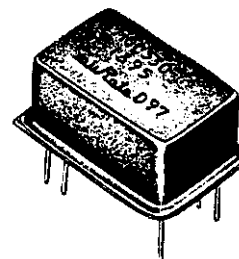
Microwave Oscillator V.C.O.



MQE000series

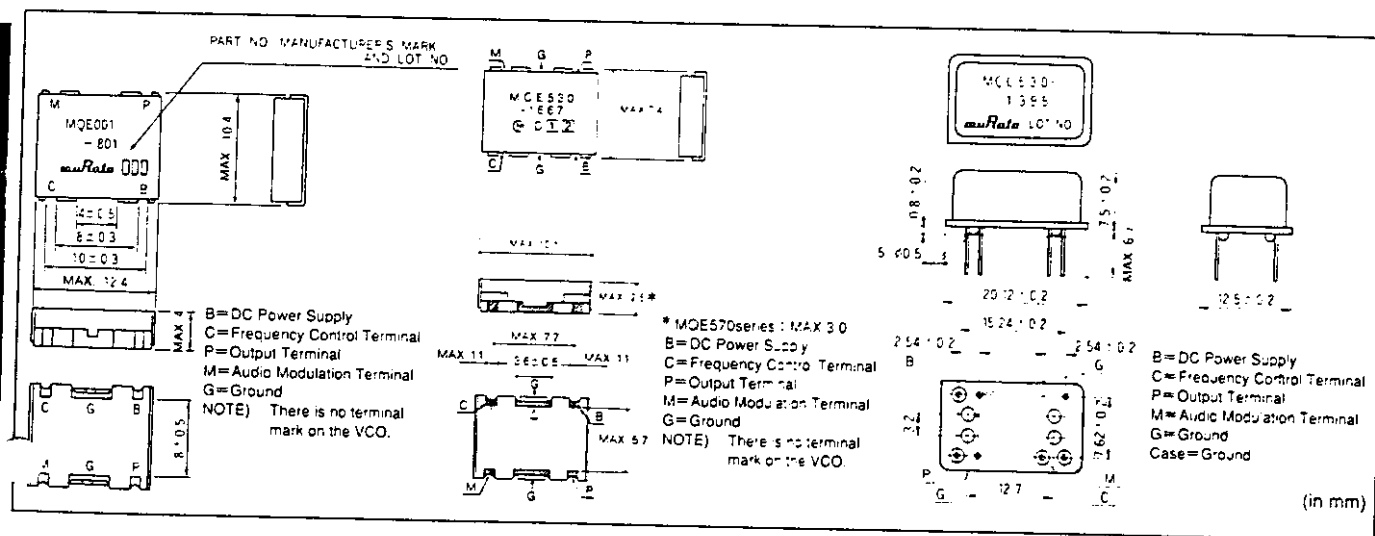


MQE500/570series



MQC400/500series

DIMENSIONS



FEATURES

1. Small, light and helpful for your compact set design.
2. SMD type, with the built-in stripline resonator. (MQEseries)
3. Lower power consumption.
4. Higher C/N level.

PART NUMBERING (※ Please specify the part number when ordering.)

(Ex.) **MQE** **001** - **801** - **T1**

- ① Indicates VCO.
- ② Type Code
- ③ Oscillation Frequency (Center Frequency in MHz)
- ④ Taping Package

(For mass-production orders, this product shall be supplied in taping package.)

Package unit MQE000series : 1000pieces/reel

MQE500/570series : 500pieces/reel

APPLICATIONS

Mobile, Hand Held Telephone, The Other Mobile, Communication Systems

MICROWAVE OSCILLATOR

muRata

Microwave Oscillator V.C.O.

ELECTRICAL CHARACTERISTICS

• For Analog Cellular

Application		Part Number	Oscillation Frequency (MHz)	Supply Voltage (V)	Control Voltage Range (V)	Control Voltage Sensitivity (MHz/V)	Output Level (dBm)	Power Consumption (mA MAX)	Audio Modulation Sensitivity(1) (mVrms)	S/N(2) (dB MIN)	C/N(3) (dBc/HzMIN)
E-AMPS	Tx	MQE001-836	836.5±12.5	4.2±0.25	1.0~4.0	≥9.0	≥-4.0	6.5	124~248(±8)	52 (±8)	110 (25)
		MQE501-836	836.5±12.5	4.3±0.25	1.0~4.0	≥11.0	≥-1.0	7.0	124~248(±10)	52 (±8)	114 (60)
	Rx	MQE001-926	926.5±12.5	4.2±0.25	1.0~4.0	≥10.0	≥-5.0	6.5	-	52 (±8)	110 (25)
		MQE001-964	964.5±12.5	4.2±0.25	1.0~4.0	≥9.0	≥-5.0	8.0	-	52 (±8)	110 (25)
		MQE043-964	964.5±12.5	3.2±0.25	1.0~3.0	≥13.0	≥-6.0	8.0	-	52 (±8)	100 (60)
		MQE501-785	785.8±12.5	4.3±0.25	1.0~4.0	≥11.0	≥-1.0	7.0	-	45 (±3)	114 (60)
		MQE501-926	926.5±12.5	4.5±0.25	0.7~4.3	≥8.5	≥-5.0	7.0	-	52 (±8)	109 (30)
		MQE501-964	964.5±12.5	4.2±0.25	1.0~4.0	≥9.0	≥-2.0	8.0	-	52 (±8)	109 (25)
E-TACS	Tx	MQE001-888	888.5±16.5	4.2±0.25	1.0~4.0	≥12.0	≥-4.5	6.5	124~248(±10)	52 (±8)	109 (25)
		MQE001-978	978.5±16.5	4.2±0.25	0.7~4.3	≥11.0	≥-6.0	10.0	-	52 (±8)	109 (25)
	Rx	MQE001-1016	1016.5±16.5	4.2±0.20	0.5~4.5	≥10.0	≥-6.0	10.0	-	52(±6.4)	111 (25)
		MQE042-1016	1016.5±16.5	3.3±0.20	0.5~2.7	≥16.0	≥-6.0	7.0	-	45 (±3)	107 (25)
		MQE002-1025	1025.5±16.5	4.2±0.25	0.7~4.3	≥10.5	≥-6.5	10.0	-	52(±6.4)	111 (25)
NMT900	Tx	MQE001-902	902.5±12.5	4.2±0.25	1.0~4.0	≥10.0	≥-3.0	10.0	200~316(±3)	45 (±3)	103(12.5)
		MQE001-1018	1018.5±12.5	4.2±0.20	1.0~4.0	≥10.0	≥-6.0	10.0	-	45 (±3)	111 (25)
	Rx	MQE002-1030	1030.0±13.0	4.2±0.25	1.0~4.0	≥10.0	≥-5.0	10.0	-	45 (±3)	111 (25)
NTT	Rx	MQE001-787	787.5±12.5	5.0±0.25	1.0~4.0	≥9.0	≥-1.0	8.5	-	45 (±3)	109(12.5)
		MQE572-787	787.5±7.5	3.0±0.30	0.5~2.5	≥9.5	≥-6.0	7.0	-	45 (±3)	107(12.5)
		MQE001-801	801.5±13.5	5.0±0.25	0.5~4.5	≥10.0	≥-1.0	8.5	-	45 (±3)	109(12.5)
N-TACS	Rx	MQE002-766	766.5±13.0	4.2±0.25	1.0~4.0	≥9.0	≥-5.0	7.0	-	45 (±3)	107 (25)
		MQE570-766	766.5±13.5	3.0±0.15	0.5~2.5	≥19.0	≥-5.0	7.0	-	45 (±3)	110 (25)

• For Digital Cellular

Application	Part Number	Oscillation Frequency (MHz)	Supply Voltage (V)	Control Voltage Range (V)	Control Voltage Sensitivity (MHz/V)	Output Level (dBm)	Power Consumption (mA MAX)	Audio Modulation Sensitivity(1) (mVrms)	S/N(2) (dB MIN)	C/N(3) (dBc/HzMIN)	
ADC	Tx	MQE001-836	836.5±12.5	4.2±0.25	1.0~4.0	≥9.0	≥-4.0	6.5	124~248(±8)	52 (±8)	110 (25)
		MQE501-836	836.5±12.5	4.3±0.25	1.0~4.0	≥11.0	≥-1.0	7.0	124~248(±10)	52 (±8)	114 (60)
	Rx	MQE001-926	926.5±12.5	4.2±0.25	1.0~4.0	≥10.0	≥-5.0	6.5	-	52 (±8)	110 (25)
		MQE001-964	964.5±12.5	4.2±0.25	1.0~4.0	≥9.0	≥-5.0	8.0	-	52 (±8)	110 (25)
		MQE043-964	964.5±12.5	3.2±0.25	1.0~3.0	≥13.0	≥-6.0	8.0	-	52 (±8)	100 (60)
		MQE501-926	926.5±12.5	4.5±0.25	0.7~4.3	≥8.5	≥-5.0	7.0	-	52 (±8)	109 (30)
		MQE501-964	964.5±12.5	4.2±0.25	1.0~4.0	≥9.0	≥-2.0	8.0	-	52 (±8)	109 (25)
		GSM	Tx	MQE001-902	902.5±12.5	4.2±0.25	1.0~4.0	≥10.0	≥-3.0	10.0	200~316(±3)
Rx	MQE001-1018	1018.5±12.5	4.2±0.20	1.0~4.0	≥10.0	≥-6.0	10.0	-	45 (±3)	111 (25)	
PDC800	Rx	MQE003-730	730.0±10.0	4.3±0.25	1.0~4.0	≥7.0	≥-10.0	6.0	-	45 (±3)	114 (50)
PDC1500	Rx	MQE060-1619	1619.0±12.0	5.0±0.25	1.0~4.0	≥24.0	≥-3.5	15.0	-	40 (±8)	113(100)
		MQE530-1619	1619.0±12.0	3.9±0.25	0.9~3.5	≥14.0	≥-4.0	10.0	-	33 (±3)	110(100)

• For Digital Cordless Telephone

Application	Part Number	Oscillation Frequency (MHz)	Supply Voltage (V)	Control Voltage Range (V)	Control Voltage Sensitivity (MHz/V)	Output Level (dBm)	Power Consumption (mA MAX)	Audio Modulation Sensitivity(1) (mVrms)	S/N(2) (dB MIN)	C/N(3) (dBc/HzMIN)	
DECT	Tx	*MQE030-1890	1890.0±15.0	3.0±0.25	0.5~2.5	≥15.0	≥-5.0	10.0	-	-	100 (50)
	T/Rx	*MQE030-1835	1835.0±65.0	3.0±0.25	0.5~2.5	≥65.0	≥-4.0	15.0	-	-	60 (50)
	Rx	*MQE030-1780	1780.0±10.0	3.0±0.30	0.5~2.5	≥10.0	≥-5.0	7.0	-	-	100 (10)
PHP	Rx	*MQE530-1667	1667.0±12.0	3.0±0.25	0.5~2.5	≥15.0	≥-5.0	6.0	-	-	115(150)

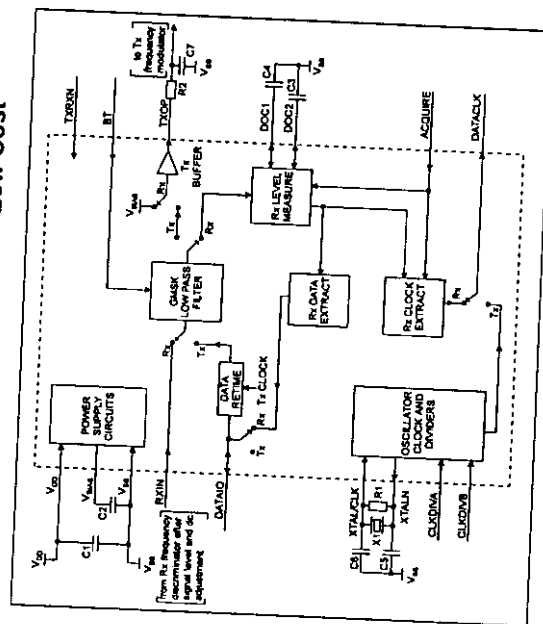
• The Other Mobile Communication Systems

Application		Part Number	Oscillation Frequency (MHz)	Supply Voltage (V)	Control Voltage Range (V)	Control Voltage Sensitivity (MHz/V)	Output Level (dBm)	Power Consumption (mA MAX)	Audio Modulation Sensitivity(1) (mVrms)	S/N(2) (dB MIN)	C/N(3) (dBc/HzMIN)
GPS	Rx	MQC530-1395	1395.0±4.5	5.0±0.25	1.0~4.0	≥3.0	≥-2.0	20.0	-	-	85 (10)
		MQC530-1485	1485.4±3.0	4.5±0.20	1.0~4.0	≥2.0	≥-3.0	15.0	-	-	75 (1)
		MQE001-787	787.5±12.5	5.0±0.25	1.0~4.0	≥9.0	≥-1.0	8.5	-	45 (±3)	109(12.5)
MCA/DMCA	Tx	MQC531-1465	1465.0±12.0	7.3±0.25	2.0~6.5	≥5.5	≥2.0	25.0	200~500(±6)	50 (±3)	114 (25)
	Rx	※MQC530-1583	1583.3±12.0	7.2±0.20	2.0~6.0	≥5.0	≥-5.0	15.0	-	40 (±3)	110 (25)
Radio Transceiver	Tx	MQC403-410	410.5±12.5	4.0±0.20	0.5~3.5	≥10.0	≥0.0	10.0	250~500(±10)	50 (±3)	114 (25)
		MQC403-432	432.5±12.5	4.0±0.20	0.5~3.5	≥10.0	≥0.0	10.0	250~500(±10)	50 (±3)	114 (25)
		MQC403-457	457.5±12.5	4.0±0.20	0.5~3.5	≥10.0	≥0.0	10.0	250~500(±10)	50 (±3)	114 (25)
	Rx	MQC404-385	385.5±12.5	4.0±0.20	0.5~3.5	≥10.0	≥0.0	10.0	-	50 (±3)	117 (25)
		MQC404-410	410.5±12.5	4.0±0.20	0.5~3.5	≥10.0	≥0.0	10.0	-	50 (±3)	117 (25)
		MQC404-490	490.5±12.5	4.0±0.20	0.5~3.5	≥10.0	≥0.0	10.0	-	50 (±3)	117 (25)

1.0 Features

- Half Duplex GSM Modem for FM Radio Data Links
- Acquire Pin to assist with the acquisition of Rx Data signals
- Pin-Programmable Rx/Tx Data Rates:
 - 4k to 20 kbits/sec at $V_{DD} = 3.0V$
 - 4k to 40 kbits/sec at $V_{DD} = 5.0V$
- Serial Data Interface with Rx/Tx Data Clock
- Low Operating Power:
 - < 2mA at 3.0V, < 4mA at 5.0V
 - Non-DSP solution
- Telemetry, Wireless Alarms, PC, Laptop and Printer Comms, WAN and LAN and General Purpose Data Applications
- 16-Pin Package with few External Components
- Low Cost

D/579/4 September 1995
Provisional Issue



1.1 Brief Description

The FX579 is a single chip, low cost, low current integrated circuit that performs the baseband functions of a half duplex GSM modem and is intended for use in FM radio data links. This general purpose modem is suitable for data rates in the region of 4 to 40 kbits/sec, at a BT of 0.3 or 0.5.

The Tx and Rx data lines share a common pin and data is synchronised to a Tx/Rx data clock generated by the modem. A single ACQUIRE line is provided to assist with acquisition of Rx data signals.

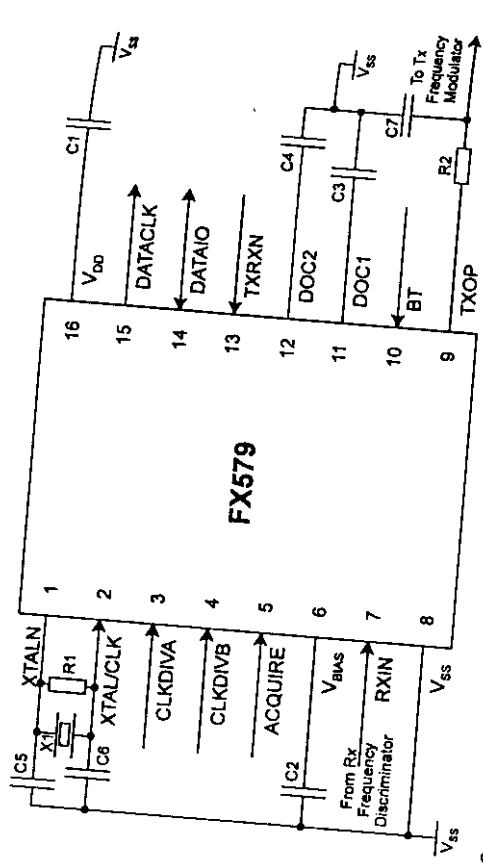
1.3 Signal List

Package D4	Signal		Description
Pin No.	Name	Type	
1	XTALN	O/P	The output of the on-chip oscillator.
2	XTAL/CLK	I/P	The input to the on-chip oscillator for an external Xtal circuit or clock.
3	CLKDIVA	I/P	Two logic level inputs that control the internal clock divider and hence the transmit and receive data rate (See Table 1).
4	CLKDIVB	I/P	
5	ACQUIRE	I/P	A logic "1" applied to this input will set the Rx level measurement and Rx clock extraction circuitry to 'acquire' mode.
6	VBIAS	O/P	The internal circuitry bias line, held at $\frac{1}{2} V_{DD}$, this pin must be decoupled to V_{SS} by a capacitor mounted close to the pin.
7	RXIN	I/P	The Rx signal input from the radio's discriminator via suitable signal and dc level adjustment. In Rx this pin is internally held at $\frac{1}{2} V_{DD}$.
8	VSS	Power	Negative supply rail. Signal ground.
9	TXOP	O/P	The Tx signal output. This signal should be applied to an external RC before being applied to the radio modulator.
10	BT	I/P	A logic level input to select the modem 'BT' (the ratio of the Tx filter -3dB frequency to the bit rate). A logic "1" sets the modem to a BT of 0.5, a logic "0" to a BT of 0.3.
11 12	DOC1 DOC2	O/P O/P	Two pins used by the modem's Rx level measurement circuitry. A capacitor should be connected from each pin to V_{SS} .
13	TXRXN	I/P	A logic level applied to this pin determines whether the modem operates in Tx or Rx mode. A logic "1" sets Tx mode. A logic "0" sets Rx mode.

Package D4	Signal		Description
Pin No.	Name	Type	
14	DATAIO	BI	A bidirectional pin that is used for inputting Tx data or outputting Rx data.
15	DATACLK	O/P	This pin outputs either the Tx DATACLK in Tx mode or the Rx DATACLK in Rx mode.
16	VDD	Power	Positive supply rail. A single stable power supply is required. Levels and voltages within this modem are dependent upon this supply. This pin should be decoupled to V_{SS} by a capacitor mounted close to the pin.

Notes:

I/P = Input
 O/P = Output
 BI = Bidirectional



Component	Value	Tolerance	Component	Value	Tolerance
R1	1M Ω	$\pm 10\%$	C3	Note 2	$\pm 20\%$
R2	Note 1	$\pm 5\%$	C4	Note 2	$\pm 20\%$
X1	Note 3	$\pm 20\%$	C5	Note 3	$\pm 20\%$
C1	100nF	$\pm 20\%$	C6	Note 3	$\pm 20\%$
C2	100nF	$\pm 20\%$	C7	Note 3	$\pm 5\%$

Notes:

- The RC network formed by R2 and C7 is required between the TXOP pin and the input to the modulator. This network can form part of any dc level shifting and gain adjustment circuitry, forms an important part of the transmit signal filtering, the ground connection to the capacitor C7, should be positioned to give maximum attenuation of high frequency noise to the modulator. The component values should be chosen so that the product of the resistance (Ohms) and the capacitance (Farads) is:
BT of 0.3 = 0.34/bit rate (bits/sec)
BT of 0.5 = 0.21/bit rate (bits/sec)
with suitable values for common bit rates being:

4000 bits/sec	BT = 0.3	R2	C7
4800 bits/sec	BT = 0.5	180.0k Ω	470pF
8000 bits/sec	BT = 0.3	91.0k Ω	470pF
9600 bits/sec	BT = 0.5	91.0k Ω	470pF
19 200 bits/sec	BT = 0.5	47.0k Ω	470pF
32 000 bits/sec	BT = 0.3	91.0k Ω	120pF
32 000 bits/sec	BT = 0.5	47.0k Ω	220pF
38 400 bits/sec	BT = 0.3	47.0k Ω	150pF
38 400 bits/sec	BT = 0.5	47.0k Ω	180pF
		47.0k Ω	120pF

Note that in all cases the value of R2 should not be less than 47.0k Ω and that the calculated value of C7 includes calculated parasitic capacitances.
C3 and C4 should both be 15.0nF for a data rate of 8kbits/sec, and inversely proportional to the data rate for other data rates e.g. 30.0nF at 4kbits/sec, 3.0nF at 40kbits/sec.
The FX579 can operate correctly with XTAL/Clock frequencies between 1.0MHz and 6.5MHz (V_{DD} = 5V) and up to 5.0MHz (V_{DD} = 3V). The value chosen for C5 and C6 should be suitable for the applied V_{DD} and the frequency of X1 and include stray capacitance. As a guide:
At 5 Volts, C5 = C6 = 33.0pF at 1.0MHz falling to 18pF at 6.5MHz
At 3 Volts, C5 = C6 = 33.0pF at 1.0MHz falling to 18pF at 6.5MHz
The equivalent series resistance of X1 should be less than 2.0k Ω at 1MHz falling to 150 Ω at the maximum frequency. Stray capacitance on the XTAL/Clock circuit pins must be minimised.

Figure 2 Recommended External Components (SOIC Package)

5 General Description

5.1 Overall Function Description

The FX579 is a single chip processor that performs the baseband function of a half duplex modem employing Gaussian minimum shift keying (GMSK) modulation. Data rates of 4kbits/sec to 40kbits/sec and the choice of BT of 0.3 or 0.5 are pin programmable functions to suit radio data channel bandwidth requirements.

Figure 3 shows how the modem is used in a typical radio application. In transmit mode data at the DATAIO pin is retime'd with the Tx clock (output at the DATACLK pin) before being level shifted and passed through the GMSK Gaussian filter to the TXOP pin. An external RC network driving the radio's frequency modulator. In receive mode, data from the radio's frequency discriminator, having been adjusted externally for signal and dc levels to provide a nominal input level of 1V pk-pk centred around $\frac{1}{2}$ V_{DD} (V_{DD} = 5V), is then processed to produce data at the DATAIO pin in binary form, together with a regenerated clock at the DATACLK pin.

Acquisition and lock of Rx data signals is made easier and faster by the use of an ACQUIRE input which can be set by the system μ Controller as required.

The FX579 features a low current analogue/digital ASIC process offering significantly lower current consumption than DSP technology. This CMOS microcircuit is available in a 16-pin small outline (SOIC) package.

1.5.2 Description of Blocks and Signal Path (Reference Block Diagram Figure 1).

Power Supply Circuits

These circuits produce the necessary internal voltage levels. Note that V_{DD} and V_{BIAS} should be decoupled to V_{SS} as shown.

Clock Oscillator and Divider

The transmit and (nominal) receive data rates are determined by division of the frequency present at the XTALN pin, which may be generated by the on-chip XTAL oscillator or come from an external source. Any XTAL/Clock frequency in the range 1.0MHz to 5.0MHz (V_{DD} = 3.0V) or 1.0MHz to 6.5MHz (V_{DD} = 5.0V) may be used depending upon the desired data rate.

A division ratio to facilitate data rate setting is controlled by the logic level inputs on the CLKDIVA and CLKDIVB pins and is shown in Table 1 together with examples of how various 'standard' data rates may be derived from common XTAL frequencies.

$$\text{Data Rate} = \frac{\text{XTAL or Clock Frequency}}{\text{Division Ratio}}$$

CLKDIVA	CLKDIVB	Division ratio = XTAL frequency ÷ Data rate	4.096 (12.288/3)	4.9152 (6.144/3)	2.048 (12.288/5)	2.4576 (12.288/5)
0	0	128	32 000	38 400	16 000	19 200
0	1	256	16 000	19 200	8000	9600
1	0	512	8000	9600	4000	4800
1	1	1024	4000	4800		

Table 1 Clock and Data Rates (in MHz and bits/sec, respectively)

$$4915, 2kHz = \frac{4}{9} \times 1059, 2kHz$$

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2 Block Diagram

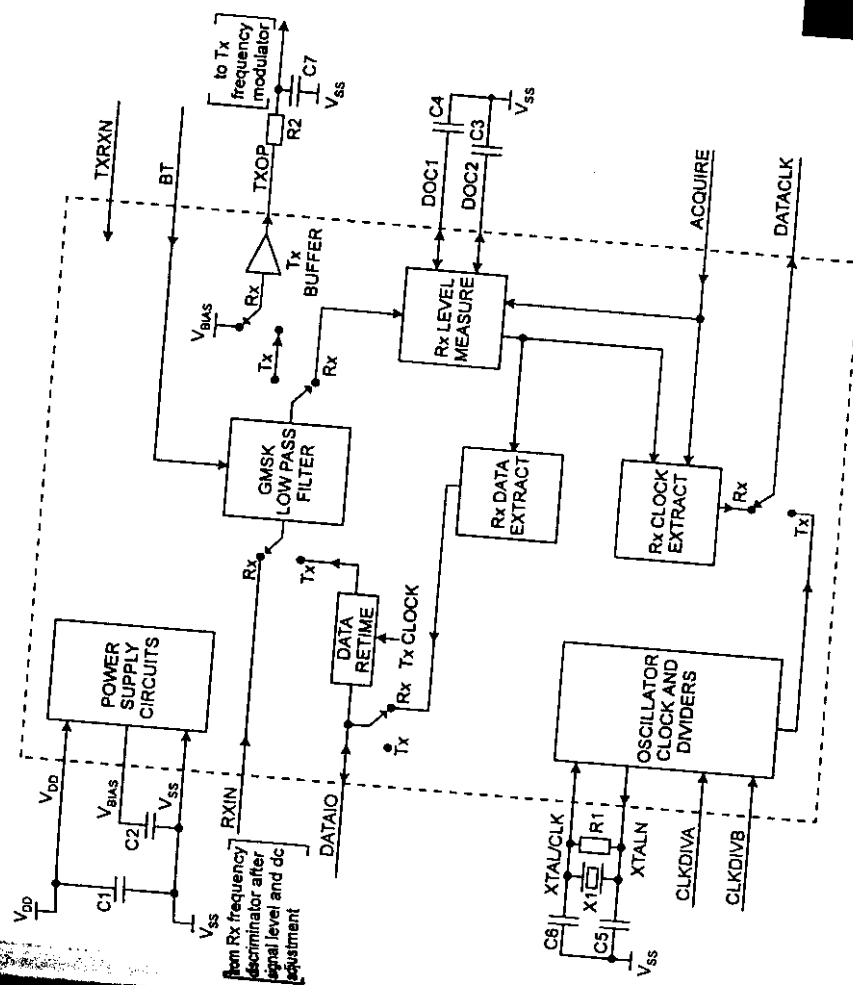


Figure 1 Block Diagram