Free Running DROs
Specification Performance

Low Phase Noise Excellent Frequency Stability Low Current High Power

June-04

8B Series	Size	MODEL 0.993" x 1.608" x 0.612"													
Specification	Units	**LO-0102-F8B**	**LO-0107-F8B**	**LO-0113-F8B**	**LO-0118-F8B**	**LO-0125-F8B**	**LO-0131-F8B**	**LO-0138-F8B**	**LO-0145-F8B**	**LO-0152-F8B**	**LO-0160-F8B**	**LO-0168-F8B**	**LO-0177-F8B**	**LO-0186-F8B**	**LO-0196-F8B**
Frequency	GHz	.998-1.049	1.050-1.102	1.103-1.159	1.160-1.218	1.219-1.281	1.282-1.347	1.348-1.416	1.417-1.488	1.489-1.565	1.566-1.645	1.646-1.729	1.730-1.818	1.819-1.911	1.912-2.009
Frequency pushing	kHz/V	51	54	57	59	63	66	69	73	76	80	84	89	93	98
Load pulling (2)	kHz	205	215	226	238	250	263	276	291	305	321	338	355	373	392
RF power	dBm	12-15	12-15	12-15	12-15	12-15	12-15	12-15	12-15	12-15	12-15	12-15	12-15	12-15	12-15
Phase noise	(1 Hz BW)														
@10 kHz	dBc/Hz	-112	-111	-111	-110	-110	-110	-110	-109	-108	-108	-107	-107	-107	-106
@100 kHz	dBc/Hz	-137	-136	-136	-135	-135	-135	-135	-134	-133	-133	-132	-132	-132	-131
@ 1 MHz	dBc/Hz	-141	-141	-141	-141	-141	-141	-141	-141	-141	-141	-141	-141	-141	-141
Frequency stability (4)	kHz	113	118	124	131	138	145	152	160	168	177	186	195	205	216
Mechanical tuning	MHz	> +/- .819	> +/- .861	> +/- .905	> +/- .951	> +/- 1.000	> +/- 1.052	> +/- 1.106	> +/- 1.162	> +/- 1.222	> +/- 1.284	> +/- 1.350	> +/- 1.419	> +/- 1.492	> +/- 1.568
Electrical tuning, min (1)	kHz	348	366	385	404	425	447	470	494	519	546	574	603	634	667
Tune voltage range (1)	V	0.6 to 7.4	0.6 to 7.4	0.6 to 7.4	0.6 to 7.4	0.6 to 7.4	0.6 to 7.4	0.6 to 7.4	0.6 to 7.4	0.6 to 7.4	0.6 to 7.4	0.6 to 7.4	0.6 to 7.4	0.6 to 7.4	0.6 to 7.4
Tune voltage center (1)		4	4	4	4	4	4	4	4	4	4	4	4	4	4

Other Parameters

Harmonics dBc	Spurious dBc	Supply Voltage V (3)	Supply Current mA	Temperature		Stability Over Temperature (p-p)		Aging ppm/year
				Operating ºC	Storage ºC	Frequency ppm (4)	Power dB (5)	
-25	-70	5-16	104	-40 to +70	-55 to +85	100	2	+/- 1

Notes:
1. Varactor tuning is included in every unit.
2. Maximum frequency variation for 360º phase change in a 1.5:1 load.
3. Recommended input voltage. Unit equipped with on board regulator.
4. Total frequency variation over entire operating temperature range.
5. Total power variation over entire operating temperature range.

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Free Running DROs
Specification Performance

Low Phase Noise Excellent Frequency Stability Low Current High Power

June-04

4B Series	Size	MODEL 0.993" x 1.608" x 0.612"													
Specification	Units	LO-020-F4B	LO-021-F4B	LO-022-F4B	LO-023-F4B	LO-024-F4B	LO-026-F4B	LO-027-F4B	LO-029-F4B	LO-030-F4B	LO-032-F4B	LO-033-F4B	LO-035-F4B	LO-037-F4B	LO-039-F4B
Frequency	GHz	1.955-2.097	2.098-2.205	2.206-2.318	2.319-2.437	2.438-2.562	2.563-2.693	2.694-2.831	2.832-2.976	2.977-3.129	3.130-3.290	3.291-3.458	3.459-3.636	3.637-3.822	3.823-4.018
Frequency pushing	kHz/V	102	108	113	119	125	131	138	145	153	161	169	177	186	196
Load pulling (2)	kHz	409	430	452	476	500	526	553	581	611	642	675	710	746	784
RF power	dBm	12-15	12-15	12-15	12-15	12-15	12-15	12-15	12-15	12-15	12-15	12-15	12-15	12-15	12-15
Phase noise	(1 Hz BW)														
@10 kHz	dBc/Hz	-106	-105	-105	-104	-104	-104	-103	-103	-102	-102	-101	-101	-101	-100
@100 kHz	dBc/Hz	-131	-130	-130	-129	-129	-129	-128	-128	-127	-127	-126	-126	-126	-125
@ 1 MHz	dBc/Hz	-141	-141	-141	-141	-141	-141	-141	-141	-141	-141	-141	-141	-141	-141
Frequency stability (4)	kHz	223	237	249	262	275	289	304	319	336	353	371	390	405	426
Mechanical tuning	MHz	> +/- 1.637	> +/- 1.721	> +/- 1.810	> +/- 1.902	> +/- 2.000	> +/- 2.102	> +/- 2.210	> +/- 2.323	> +/- 2.442	> +/- 2.568	> +/- 2.700	> +/- 2.838	> +/- 2.984	> +/- 3.136
Electrical tuning, min (1)	kHz	.70	.73	.77	.81	.85	.89	.94	.99	1.04	1.09	1.15	1.21	1.27	1.33
Tune voltage range (1)	V	0.6 to 7.4	0.6 to 7.4	0.6 to 7.4	0.6 to 7.4	0.6 to 7.4	0.6 to 7.4	0.6 to 7.4	0.6 to 7.4	0.6 to 7.4	0.6 to 7.4	0.6 to 7.4	0.6 to 7.4	0.6 to 7.4	0.6 to 7.4
Tune voltage center (1)		4	4	4	4	4	4	4	4	4	4	4	4	4	4

Other Parameters

Harmonics dBc	Spurious dBc	Supply Voltage V (3)	Supply Current mA	Temperature		Stability Over Temperature (p-p)		Aging ppm/year
				Operating ºC	Storage ºC	Frequency ppm (4)	Power dB (5)	
-25	-70	5-16	104	-40 to +70	-55 to +85	100	2	+/- 1

Notes:
1. Varactor tuning is included in every unit.
2. Maximum frequency variation for 360º phase change in a 1.5:1 load.
3. Recommended input voltage. Unit equipped with on board regulator.
4. Total frequency variation over entire operating temperature range.
5. Total power variation over entire operating temperature range.

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Free Running DROs
Specification Performance

Low Phase Noise Excellent Frequency Stability Low Current High Power

June-04

2B Series	Size	MODEL 0.993" x 1.608" x 0.612"													
Specification	Units	**LO-040-F2B**	**LO-043-F2B**	**LO-045-F2B**	**LO-047-F2B**	**LO-049-F2B**	**LO-052-F2B**	**LO-055-F2B**	**LO-058-F2B**	**LO-061-F2B**	**LO-064-F2B**	**LO-067-F2B**	**LO-070-F2B**	**LO-074-F2B**	**LO-078-F2B**
Frequency	GHz	3.991-4.195	4.196-4.410	4.411-4.636	4.637-4.874	4.875-5.124	5.125-5.386	5.387-5.662	5.663-5.953	5.954-6.258	6.259-6.579	6.580-6.916	6.917-7.271	7.272-7.644	7.645-8.036
Frequency pushing	kHz/V	205	215	226	238	250	263	276	290	305	321	337	355	373	392
Load pulling (2)	kHz	819	861	905	951	1000	1051	1105	1162	1221	1284	1350	1419	1492	1568
RF power	dBm	12-15	12-15	12-15	12-15	12-15	12-15	12-15	12-15	12-15	12-15	12-15	12-15	12-15	12-15
Phase noise	(1 Hz BW)														
@10 kHz	dBc/Hz	-100	-99	-99	-98	-98	-98	-97	-97	-96	-96	-95	-95	-95	-94
@100 kHz	dBc/Hz	-125	-124	-124	-123	-123	-123	-122	-122	-121	-121	-120	-120	-120	-119
@ 1 MHz	dBc/Hz	-141	-141	-141	-141	-141	-141	-141	-141	-141	-141	-141	-141	-141	-141
Frequency stability (4)	kHz	450	473	498	523	550	578	608	639	672	706	742	780	820	862
Mechanical tuning	MHz	> +/- 3.274	> +/- 3.442	> +/- 3.619	> +/- 3.804	> +/- 4.000	> +/- 4.204	> +/- 4.420	> +/- 4.646	> +/- 4.885	> +/- 5.135	> +/- 5.398	> +/- 5.675	> +/- 5.966	> +/- 6.272
Electrical tuning, min (1)	kHz	1.39	1.46	1.54	1.62	1.70	1.79	1.88	1.97	2.08	2.18	2.29	2.41	2.54	2.67
Tune voltage range (1)	V	0.6 to 7.4	0.6 to 7.4	0.6 to 7.4	0.6 to 7.4	0.6 to 7.4	0.6 to 7.4	0.6 to 7.4	0.6 to 7.4	0.6 to 7.4	0.6 to 7.4	0.6 to 7.4	0.6 to 7.4	0.6 to 7.4	0.6 to 7.4
Tune voltage center (1)		4	4	4	4	4	4	4	4	4	4	4	4	4	4

Other Parameters

Harmonics dBc	Spurious dBc	Supply Voltage V (3)	Supply Current mA	Temperature		Stability Over Temperature (p-p)		Aging ppm/year
				Operating ºC	Storage ºC	Frequency ppm (4)	Power dB (5)	
-25	-70	5-16	104	-40 to +70	-55 to +85	108	2	+/- 1

Notes:
1. Varactor tuning is included in every unit.
2. Maximum frequency variation for 360º phase change in a 1.5:1 load.
3. Recommended input voltage. Unit equipped with on board regulator.
4. Total frequency variation over entire operating temperature range.
5. Total power variation over entire operating temperature range.

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Free Running DROs
Specification Performance

Low Phase Noise Excellent Frequency Stability Low Current High Power

June-04

B Series	Size	MODEL 0.610" x 1.000" x 1.000"													
Specification	Units	**LO-081-FB**	**LO-086-FB**	**LO-090-FB**	**LO-095-FB**	**LO-099-FB**	**LO-105-FB**	**LO-110-FB**	**LO-116-FB**	**LO-122-FB**	**LO-128-FB**	**LO-134-FB**	**LO-141-FB**	**LO-149-FB**	**LO-156-FB**
Frequency	GHz	7.981-8.389	8.390-8.819	8.820-9.271	9.272-9.747	9.748-10.250	10.251-10.770	10.771-11.320	11.321-11.900	11.901-12.520	12.521-13.160	13.161-13.830	13.831-14.540	14.541-15.290	15.291-16.070
RF power	dBm	12-15	12-15	12-15	11-14	11-14	11-14	11-14	10-13	10-13	10-13	10-13	9-12	9-12	9-12
Frequency pushing	kHz/V	414	430	452	475	500	502	505	508	610	640	675	710	745	785
Load pulling (2)	MHz	1.64	1.72	1.88	1.9	2	2.1	2.2	2.32	2.44	2.56	2.7	2.84	2.98	3.14
Phase noise	(1 Hz BW)														
@10 kHz	dBc/Hz	-94	-93	-93	-92	-92	-92	-91	-91	-90	-90	-89	-89	-89	-88
@100 kHz	dBc/Hz	-119	-118	-118	-117	-117	-117	-116	-116	-115	-115	-114	-114	-114	-113
@ 1 MHz	dBc/Hz	-144	-143	-143	-142	-142	-142	-141	-141	-140	-140	-139	-139	-139	-138
Frequency stability (4)	MHz	.818	.860	.904	.951	1.000	1.05	1.10	1.16	1.22	1.28	1.35	1.42	1.49	1.57
Mechanical tuning	MHz	> +/- 6.6	> +/- 6.8	> +/- 7.2	> +/- 7.6	> +/- 8.0	> +/- 8.4	> +/- 9.2	> +/- 9.6	> +/- 9.8	> +/- 10.2	> +/- 10.8	> +/- 11.4	> +/- 12.0	> +/- 12.6
Electrical tuning, min (1)	MHz	2.8	2.9	3.1	3.2	3.4	3.6	3.9	4.1	4.2	4.3	4.6	4.8	5.1	5.4
Tune voltage range (1)	V	0.6 to 7.4	0.6 to 7.4	0.6 to 7.4	0.6 to 7.4	0.6 to 7.4	0.6 to 7.4	0.6 to 7.4	0.6 to 7.4	0.6 to 7.4	0.6 to 7.4	0.6 to 7.4	0.6 to 7.4	0.6 to 7.4	0.6 to 7.4
Tune voltage center (1)	V	4	4	4	4	4	4	4	4	4	4	4	4	4	4

Other Parameters

Harmonics dBc	Spurious dBc	Supply Voltage V (3)	Supply Current mA	Temperature		Stability Over Temperature (p-p)		Aging ppm/year
				Operating ºC	Storage ºC	Frequency ppm (4)	Power dB (5)	
-25	-95	5-16	55	-40 to +70	-55 to +85	100	2	+/- 1

Notes:
1. Varactor tuning is included in every unit.
2. Maximum frequency variation for 360º phase change in a 1.5:1 load.
3. Recommended input voltage. Unit equipped with on board regulator.
4. Total frequency variation over entire operating temperature range.
5. Total power variation over entire operating temperature range.

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Free Running DROs
Specification Performance

Low Phase Noise Excellent Frequency Stability Low Current High Power

June-04

C series		MODEL									
	Size	0.640" x 0.720" x 0.499"								1.608" x 0.993" x 0.612"	
Specification	Units	**LO-164-FC**	**LO-173-FC**	**LO-182-FC**	**LO-191-FC**	**LO-201-FC**	**LO-211-FC**	**LO-222-FC**	**LO-233-FC**	**LO-245-FC**	**LO-258-FC**
Frequency	GHz	16.071-16.900	16.901-17.760	17.761-18.670	18.671-19.630	19.631-20.640	20.641-21.700	21.701-22.810	22.811-23.980	23.981-25.210	25.211-26.500
RF power	dBm	9-12	9-12	8-11	8-11	8-11	8-11	7-10	7-10	7-10	7-10
frequency pushing	MHz/V	0.825	0.865	0.91	0.955	1.01	1.06	1.12	1.17	1.23	1.3
load pulling (2)	MHz	3.3	3.46	3.64	3.82	4.02	4.24	4.46	4.68	4.92	5.18
Phase noise	(1 Hz BW)										
@10 kHz	dBc/Hz	-88	-87	-87	-86	-86	-85	-85	-85	-84	-84
@100 kHz	dBc/Hz	-113	-112	-112	-111	-111	-110	-110	-110	-109	-109
@ 1 MHz	dBc/Hz	-138	-137	-137	-136	-136	-135	-135	-135	-134	-134
Frequency stability (4)	MHz	1.65	1.73	1.82	1.91	2.01	2.12	2.23	2.34	2.46	2.59
Mechanical tuning	MHz	> +/- 13.2	> +/- 13.8	> +/- 14.6	> +/- 15.2	> +/- 16.0	> +/- 17.0	> +/- 17.8	> +/- 18.8	> +/- 19.6	> +/- 20.8
Electrical tuning, min (1)	MHz	5.6	5.9	6.2	6.5	6.8	7.2	7.6	8.0	8.3	8.8
Tune voltage range (1)	V	0.6 to 7.4	0.6 to 7.4	0.6 to 7.4	0.6 to 7.4	0.6 to 7.4	0.6 to 7.4	0.6 to 7.4	0.6 to 7.4	0.6 to 7.4	0.6 to 7.4
Tune voltage center (1)	V	4	4	4	4	4	4	4	4	4	4

Other Parameters

Harmonics dBc	Spurious dBc	Supply Voltage V	Supply Current mA (7)	Temperature		Stability Over Temperature (p-p)		Aging ppm/year
				Operating ºC	Storage ºC	Frequency ppm (4)	Power dB (5) (6)	
-25	-95	5-16	55	-40 to +70	-55 to +85	100	2	+/- 1

Notes:
1. Varactor tuning is included in every unit.
2. Maximum frequency variation for 360º phase change in a 1.5:1 load.
3. Recommended input voltage. Unit equipped with on board regulator.
4. Total frequency variation over entire operating temperature range.
5. Total power variation over entire operating temperature range.
6. 3dB for LO-245-FC and LO-258-FC
7. 125 mA for LO-245-FC and LO-258-FC

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Free Running DROs
Specification Performance

Low Phase Noise Excellent Frequency Stability Low Current High Power

June-03

D series		MODEL									
	Size	1.608" x .993" x 0.612"				0.610" x 1.230" x 0.495"					
Specification	Units	**LO-271-FD**	**LO-285-FD**	**LO-299-FD**	**LO-315-FD**	**LO-330-FD**	**LO-347-FD**	**LO-365-FD**	**LO-383-FD**	**LO-403-FD**	**LO-423-FD**
Frequency	GHz	26.5-27.84	27.84-29.25	29.25-30.73	30.73-32.29	32.29-33.92	33.92-35.64	35.64-37.44	37.44-39.34	39.34-41.33	41.33-43.42
RF power	dBm	6-9	6-9	6-9	6-9	5-8	5-8	5-8	5-8	4-7	4-7
Frequency pushing	MHz/V	1.36	1.425	1.5	1.58	1.66	1.74	1.82	1.92	2.01	2.12
Load pulling (2)	MHz	5.44	5.7	6	6.3	6.62	6.96	7.3	7.68	8.04	8.48
Phase noise	(1 Hz BW)										
@10 kHz	dBc/Hz	-83	-83	-82	-82	-82	-81	-81	-80	-80	-80
@100 kHz	dBc/Hz	-108	-108	-107	-107	-107	-106	-106	-105	-105	-105
@ 1 MHz	dBc/Hz	-133	-133	-132	-132	-132	-131	-131	-130	-130	-130
Frequency Stability (4)	MHz	2.72	2.85	3.00	3.15	3.31	3.48	3.65	3.84	4.02	4.24
Mechanical tuning	MHz	> +/- 21.8	> +/- 22.8	> +/- 24.0	> +/- 25.1	> +/- 26.4	> +/- 27.8	> +/- 29.2	> +/- 30.8	> +/- 32.2	> +/- 34.0
Electrical tuning, min (1)	MHz	9.3	9.7	10.2	10.7	11.2	11.8	12.4	13.1	13.7	14.5
Tune voltage range (1)	V	0.6 to 7.4	0.6 to 7.4	0.6 to 7.4	0.6 to 7.4	0.6 to 7.4	0.6 to 7.4	0.6 to 7.4	0.6 to 7.4	0.6 to 7.4	0.6 to 7.4
Tune voltage center (1)	V	4	4	4	4	4	4	4	4	4	4

Other Parameters

Harmonics dBc	Spurious dBc	Supply Voltage V (3)	Supply Current mA	Temperature		Stability Over Temperature (p-p)		Aging ppm/year
				Operating ºC	Storage ºC	Frequency ppm (4)	Power dB (5)	
-25	-95	5-16	135	-40 to +70	-55 to +85	100	2	+/- 1

Notes:
1. Varactor tuning is included in every unit.
2. Maximum frequency variation for 360º phase change in a 1.5:1 load.
3. Recommended input voltage. Unit equipped with on board regulator.
4. Total frequency variation over entire operating temperature range.
5. Total power variation over entire operating temperature range.

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Phase-Locked DROs - External Reference Specification Performance

Low Phase Noise Excellent Frequency Stability Low Current High Power

June-04

8B series	Size (7)	MODEL 2.000" x 1.883" x 0.652"													
Specification	Units	LO-0102-E8B	LO-0107-E8B	LO-0113-E8B	LO-0118-E8B	LO-0125-E8B	LO-0131-E8B	LO-0138-E8B	LO-0145-E8B	LO-0152-E8B	LO-0160-E8B	LO-0168-E8B	LO-0177-E8B	LO-0186-E8B	LO-0196-E8B
Frequency	GHz	.998-1.049	1.050-1.102	1.103-1.159	1.160 - 1.218	1.219 - 1.281	1.282 - 1.347	1.348 - 1.416	1.417 - 1.488	1.489 - 1.565	1.566 - 1.645	1.646 - 1.729	1.730 - 1.818	1.819 - 1.911	1.912 - 2.009
RF power (5)	dBm	12-15	12-15	12-15	12-15	12-15	12-15	12-15	12-15	12-15	12-15	12-15	12-15	12-15	12-15
Reference frequency (1)	MHz	50 to 500	50 to 500	50 to 500	50 to 500	50 to 500	50 to 500	50 to 500	50 to 500	50 to 500	50 to 500	50 to 500	50 to 500	50 to 500	50 to 500
Reference power (2)	dBm	-3 to +13	-3 to +13	-3 to +13	-3 to +13	-3 to +13	-3 to +13	-3 to +13	-3 to +13	-3 to +13	-3 to +13	-3 to +13	-3 to +13	-3 to +13	-3 to +13
Phase noise	(1 Hz BW)														
@ 100 kHz	REF + dB	20*log(N)+3	20*log(N)+3	20*log(N)+3	20*log(N)+3	20*log(N)+3	20*log(N)+3	20*log(N)+3	20*log(N)+3	20*log(N)+3	20*log(N)+3	20*log(N)+3	20*log(N)+3	20*log(N)+3	20*log(N)+3
@100 kHz	dBc/Hz	-137	-136	-136	-135	-135	-135	-134	-134	-133	-133	-132	-132	-132	-131
@ 1 MHz	dBc/Hz	-141	-141	-141	-141	-141	-141	-141	-141	-141	-141	-141	-141	-141	-141
Mechanical tuning (6)	MHz	> +/- 0.819	> +/- 0.861	> +/- 0.905	> +/- 0.951	> +/- 1.000	> +/- 1.052	> +/- 1.162	> +/- 1.162	> +/- 1.222	> +/- 1.284	> +/- 1.350	> +/- 1.419	> +/- 1.492	> +/- 1.568

Other Parameters

Harmonics dBc	Spurious dBc	Supply Voltage V	Supply Current mA	Temperature		Stability Over Temperature (p-p)	Lock
				Operating ºC	Storage ºC	Power dB (5)	Alarm
-25	-70	9-16	315	-40 to +70	-55 to +85	2	TTL Low

Notes:
1. The (output frequency/(reference frequency) must be an integer. The integer value N determines the phase noise at <100kHz offsets.
2. The reference power is required to fall within a 6 dB window over the specified power range. Higher operating power yields better phase noise performance.
3. Loop bandwidth setting based on reference noise characteristics, typically 10 kHz to 200 kHz.
4. Total power variation over entire operating temperature range.
5. High output power is available. Please contact the factory for more information.
6. Not applicable to hermetically sealed Rugged Ultra Reliable DRO products.
7. Rugged Ultra Reliable DRO products measure 2.350" x 2.000" x 0.700".

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Phase-Locked DROs - External Reference Specification Performance

Low Phase Noise Excellent Frequency Stability Low Current High Power

June-04

4B series	Size (7)	MODEL 2.000" x 1.883" x 0.652"													
Specification	Units	LO-020-E4B	LO-021-E4B	LO-022-E4B	LO-023-E4B	LO-024-E4B	LO-026-E4B	LO-027-E4B	LO-029-E4B	LO-030-E4B	LO-032-E4B	LO-033-E4B	LO-035-E4B	LO-037-E4B	LO-039-E4B
Frequency	GHz	1.955 - 2.097	2.098 - 2.205	2.206 - 2.318	2.319 - 2.437	2.438 -2.562	2.563 - 2.693	2.694 - 2.831	2.832 - 2.976	2.977 - 3.129	3.130 - 3.290	3.291 - 3.458	3.459 - 3.636	3.637 - 3.822	3.823 - 4.018
RF power (5)	dBm	12-15	12-15	12-15	12-15	12-15	12-15	12-15	12-15	12-15	12-15	12-15	12-15	12-15	12-15
Reference frequency (1)	MHz	50 to 500	50 to 500	50 to 500	50 to 500	50 to 500	50 to 500	50 to 500	50 to 500	50 to 500	50 to 500	50 to 500	50 to 500	50 to 500	50 to 500
Reference power (2)	dBm	-3 to +13	-3 to +13	-3 to +13	-3 to +13	-3 to +13	-3 to +13	-3 to +13	-3 to +13	-3 to +13	-3 to +13	-3 to +13	-3 to +13	-3 to +13	-3 to +13
Phase noise	(1 Hz BW)														
@ 100 kHz	REF + dB	20*log(N)+3	20*log(N)+3	20*log(N)+3	20*log(N)+3	20*log(N)+3	20*log(N)+3	20*log(N)+3	20*log(N)+3	20*log(N)+3	20*log(N)+3	20*log(N)+3	20*log(N)+3	20*log(N)+3	20*log(N)+3
@100 kHz	dBc/Hz	-131	-130	-130	-129	-129	-129	-128	-128	-127	-127	-126	-126	-126	-125
@ 1 MHz	dBc/Hz	-141	-141	-141	-141	-141	-141	-141	-141	-141	-141	-141	-141	-141	-141
Mechanical tuning (6)	MHz	> +/- 1.637	> +/- 1.721	> +/- 1.810	> +/- 1.902	> +/- 2.000	> +/- 2.102	> +/- 2.210	> +/- 2.323	> +/- 2.442	> +/- 2.568	> +/- 2.700	> +/- 2.838	> +/- 2.984	> +/- 3.136

Other Parameters

Harmonics dBc	Spurious dBc	Supply Voltage V	Supply Current mA	Temperature		Stability Over Temperature (p-p)	Lock
				Operating ºC	Storage ºC	Power dB (5)	Alarm
-25	-70	9-16	315	-40 to +70	-55 to +85	2	TTL Low

Notes:
1. The (output frequency/(reference frequency) must be an integer. The integer value N determines the phase noise at <100kHz offsets.
2. The reference power is required to fall within a 6 dB window over the specified power range. Higher operating power yields better phase noise performance.
3. Loop bandwidth setting based on reference noise characteristics, typically 10 kHz to 200 kHz.
4. Total power variation over entire operating temperature range.
5. High output power is available. Please contact the factory for more information.
6. Not applicable to hermetically sealed Rugged Ultra Reliable DRO products.
7. Rugged Ultra Reliable DRO products measure 2.350" x 2.000" x 0.700".

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Phase-Locked DROs - External Reference
Specification Performance

Low Phase Noise Excellent Frequency Stability Low Current High Power

June-04

2B series	Size (7)	MODEL													
		2.000" x 1.883" x 0.652"													
Specification	Units	**LO-040-E2B**	**LO-043-E2B**	**LO-045-E2B**	**LO-047-E2B**	**LO-049-E2B**	**LO-052-E2B**	**LO-055-E2B**	**LO-058-E2B**	**LO-061-E2B**	**LO-064-E2B**	**LO-067-E2B**	**LO-070-E2B**	**LO-074-E2B**	**LO-078-E2B**
Frequency	GHz	3.991 - 4.195	4.196 - 4.410	4.411 - 4.636	4.637 - 4.874	4.875 - 5.124	5.125 - 5.386	5.387 - 5.662	5.663 - 5.953	5.954 - 6.258	6.259 - 6.579	6.580 - 6.916	6.917 - 7.271	7.272 - 7.644	7.645 - 8.036
RF power (5)	dBm	12-15	12-15	12-15	12-15	12-15	12-15	12-15	12-15	12-15	12-15	12-15	12-15	12-15	12-15
Reference frequency (1)	MHz	50 to 500	50 to 500	50 to 500	50 to 500	50 to 500	50 to 500	50 to 500	50 to 500	50 to 500	50 to 500	50 to 500	50 to 500	50 to 500	50 to 500
Reference power (2)	dBm	-3 to +13	-3 to +13	-3 to +13	-3 to +13	-3 to +13	-3 to +13	-3 to +13	-3 to +13	-3 to +13	-3 to +13	-3 to +13	-3 to +13	-3 to +13	-3 to +13
Phase noise	(1 Hz BW)														
@ 100 kHz	REF + dB	20*log(N)+3	20*log(N)+3	20*log(N)+3	20*log(N)+3	20*log(N)+3	20*log(N)+3	20*log(N)+3	20*log(N)+3	20*log(N)+3	20*log(N)+3	20*log(N)+3	20*log(N)+3	20*log(N)+3	20*log(N)+3
@100 kHz	dBc/Hz	-125	-124	-124	-123	-123	-123	-122	-122	-121	-121	-120	-120	-120	-119
@ 1 MHz	dBc/Hz	-141	-141	-141	-141	-141	-141	-141	-141	-141	-141	-141	-141	-141	-141
Mechanical tuning (6)	MHz	> +/- 3.274	> +/- 3.442	> +/- 3.619	> +/- 3.804	> +/- 4.000	> +/- 4.204	> +/- 4.420	> +/- 4.646	> +/- 4.885	> +/- 5.135	> +/- 5.398	> +/- 5.675	> +/- 5.966	> +/- 6.272

Other Parameters

Harmonics dBc	Spurious dBc	Supply Voltage V	Supply Current mA	Temperature		Stability Over Temperature (p-p)	Lock
				Operating ºC	Storage ºC	Power dB (5)	Alarm
-25	-70	9-16	315	-40 to +70	-55 to +85	2	TTL Low

Notes:
1. The (output frequency/(reference frequency) must be an integer. The integer value N determines the phase noise at <100kHz offsets.
2. The reference power is required to fall within a 6 dB window over the specified power range. Higher operating power yields better phase noise performance.
3. Loop bandwidth setting based on reference noise characteristics, typically 10 kHz to 200 kHz.
4. Total power variation over entire operating temperature range.
5. High output power is available. Please contact the factory for more information.
6. Not applicable to hermetically sealed Rugged Ultra Reliable DRO products.
7. Rugged Ultra Reliable DRO products measure 2.350" x 2.000" x 0.700".

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Phase-Locked DROs - External Reference Specification Performance

Low Phase Noise Excellent Frequency Stability Low Current High Power

June-04

B series	Size (7)	MODEL 2" x 1.883" x 0.652"													
Specification	Units	**LO-081-EB**	**LO-086-EB**	**LO-090-EB**	**LO-095-EB**	**LO-099-EB**	**LO-105-EB**	**LO-110-EB**	**LO-116-EB**	**LO-122-EB**	**LO-128-EB**	**LO-134-EB**	**LO-141-EB**	**LO-149-EB**	**LO-156-EB**
Frequency	GHz	7.981-8.389	8.390-8.819	8.820-9.271	9.272-9.747	9.748-10.250	10.251-10.770	10.771-11.320	11.321-11.900	11.901-12.520	12.521-13.160	13.161-13.830	13.831-14.540	14.541-15.290	15.291-16.070
RF power (5)	dBm	13-16	13-16	13-16	13-16	13-16	13-16	13-16	13-16	13-16	13-16	13-16	13-16	13-16	13-16
Reference frequency (1)	MHz	50 to 500	50 to 500	50 to 500	50 to 500	50 to 500	50 to 500	50 to 500	50 to 500	50 to 500	50 to 500	50 to 500	50 to 500	50 to 500	50 to 500
Reference power (2)	dBm	-3 to +13	-3 to +13	-3 to +13	-3 to +13	-3 to +13	-3 to +13	-3 to +13	-3 to +13	-3 to +13	-3 to +13	-3 to +13	-3 to +13	-3 to +13	-3 to +13
Phase noise	(1 Hz BW)														
<100 kHz (3)	REF + dB	20*log(N)+3	20*log(N)+3	20*log(N)+3	20*log(N)+3	20*log(N)+3	20*log(N)+3	20*log(N)+3	20*log(N)+3	20*log(N)+3	20*log(N)+3	20*log(N)+3	20*log(N)+3	20*log(N)+3	20*log(N)+3
@100 kHz	dBc/Hz	-119	-118	-118	-117	-117	-117	-116	-116	-115	-115	-114	-114	-114	-113
@ 1 MHz	dBc/Hz	-144	-143	-143	-142	-142	-142	-141	-141	-140	-140	-139	-139	-139	-138
Mechanical tuning (6)	MHz	> +/- 6.6	> +/- 6.8	> +/- 7.2	> +/- 7.6	> +/- 8.0	> +/- 8.4	> +/- 9.2	> +/- 9.6	> +/- 9.8	> +/- 10.2	> +/- 10.8	> +/- 11.4	> +/- 12.0	> +/- 12.6

Other Parameters

Harmonics dBc	Spurious dBc	Supply Voltage V	Supply Current mA	Temperature		Stability Over Temperature (p-p)	Lock
				Operating ºC	Storage ºC	Power dB (4)	Alarm
-45	-80	9-16	250	-40 to +70	-55 to +85	2	TTL Low

Notes:
1. The (output frequency/(reference frequency) must be an integer. The integer value N determines the phase noise at <100kHz offsets.
2. The reference power is required to fall within a 6 dB window over the specified power range. Higher operating power yields better phase noise performance.
3. Loop bandwidth setting based on reference noise characteristics, typically 10 kHz to 200 kHz.
4. Total power variation over entire operating temperature range.
5. High output power is available. Please contact the factory for more information.
6. Not applicable to hermetically sealed Rugged Ultra Reliable DRO products.
7. Rugged Ultra Reliable DRO products measure 2.350" x 2.000" x 0.700".

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Low Phase Noise Excellent Frequency Stability Low Current High Power

June-04

C series	Size (8)	MODEL									
		2" x 1.5" x 0.50"								2" x 1.883" x .652"	
Specification	Units	**LO-164-EC**	**LO-173-EC**	**LO-182-EC**	**LO-191-EC**	**LO-201-EC**	**LO-211-EC**	**LO-222-EC**	**LO-233-EC**	**LO-245-EC**	**LO-258-EC**
Frequency	GHz	16.071-16.900	16.901-17.760	17.761-18.670	18.671-19.630	19.631-20.640	20.641-21.700	21.701-22.810	22.811-23.980	23.981-25.210	25.211-26.500
RF power (5)	dBm	13-16	13-16	13-16	13-16	13-16	13-16	13-16	13-16	7-10	7-10
Reference frequency (1)	MHz	50 to 500	50 to 500	50 to 500	50 to 500	50 to 500	50 to 500	50 to 500	50 to 500	50 to 500	50 to 500
Reference power (2)	dBm	-3 to +13	-3 to +13	-3 to +13	-3 to +13	-3 to +13	-3 to +13	-3 to +13	-3 to +13	-3 to +13	-3 to +13
Phase noise	(1 Hz BW)										
<100 kHz (3)	REF + dB	20*log(N)+3	20*log(N)+3	20*log(N)+3	20*log(N)+3	20*log(N)+3	20*log(N)+3	20*log(N)+3	20*log(N)+3	20*log(N)+3	20*log(N)+3
@100 kHz	dBc/Hz	-113	-112	-112	-111	-111	-110	-110	-110	-109	-109
@ 1 MHz	dBc/Hz	-138	-137	-137	-136	-136	-135	-135	-135	-134	-134
,echanical tuning (7)	MHz	> +/- 13.2	> +/- 13.8	> +/- 14.6	> +/- 15.2	> +/- 16.0	> +/- 17.0	> +/- 17.8	> +/- 18.8	> +/- 19.6	> +/- 20.8

Other Parameters

Harmonics dBc (6)	Spurious dBc	Supply Voltage V	Supply Current mA	Temperature		Stability Over Temperature (p-p)	Lock
				Operating ºC	Storage ºC	Power dB (4)	Alarm
-45	-80	9-16	250	-40 to +70	-55 to +85	2	TTL Low

Notes:
1. The (output frequency/(reference frequency) must be an integer. The integer value N determines the phase noise at <100kHz offsets.
2. The reference power is required to fall within a 6 dB window over the specified power range. Higher operating power yields better phase noise performance.
3. Loop bandwidth setting based on reference noise characteristics, typically 10 kHz to 200 kHz.
4. Total power variation over entire operating temperature range.
5. Higher output power is available. Please contact the factory for more information.
6. Harmonic specification for models LO-245-EC and LO-258-EC is -25 dBc.
7. Not applicable to hermetically sealed Ultra Reliable DRO products.
8. Rugged Ultra Reliable DRO products measure 2.350" x 1.600" x 0.640".

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Phase-Locked DROs - External Reference Specification Performance

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June-04

		MODEL									
D series	Size (7)	2.00" x 1.883" x 0.652"				2.00" x 1.500" x 0.500"					
Specification (Typical)	Units	**LO-271-ED**	**LO-285-ED**	**LO-299-ED**	**LO-315-ED**	**LO-330-ED**	**LO-347-ED**	**LO-365-ED**	**LO-383-ED**	**LO-403-ED**	**LO-423-ED**
Frequency	GHz	26.501-27.840	27.841-29.250	29.251-30.730	30.731-32.290	32.291-33.920	33.921-35.640	35.641-37.440	37.441-39.340	39.341-41.330	41.331-43.420
RF power (5)	dBm	7-10	7-10	7-10	7-10	6-9	6-9	6-9	6-9	6-9	6-9
Reference frequency (1)	MHz	50 to 500	50 to 500	50 to 500	50 to 500	50 to 500	50 to 500	50 to 500	50 to 500	50 to 500	50 to 500
Reference power (2)	dBm	-3 to +13	-3 to +13	-3 to +13	-3 to +13	-3 to +13	-3 to +13	-3 to +13	-3 to +13	-3 to +13	-3 to +13
Phase noise	(1 Hz BW)										
<100 kHz (3)	REF + dB	20*log(N)+3	20*log(N)+3	20*log(N)+3	20*log(N)+3	20*log(N)+3	20*log(N)+3	20*log(N)+3	20*log(N)+3	20*log(N)+3	20*log(N)+3
@100 kHz	dBc/Hz	-108	-108	-107	-107	-107	-106	-106	-105	-105	-105
@ 1 MHz	dBc/Hz	-133	-133	-132	-132	-132	-131	-131	-130	-130	-130
Mechanical tuning (6)	MHz	>=+/- 21.8	>=+/- 22.8	>=+/- 24.0	>= +/- 25.1	>= +/- 26.4	>= +/- 27.8	>= +/- 29.2	>= +/- 30.8	>= +/- 32.2	>= +/- 34.0

Other Parameters

Harmonics dBc	Spurious dBc	Supply Voltage V	Supply Current mA	Temperature		Stability Over Temperature (p-p)	Lock
				Operating ºC	Storage ºC	Power dB (4)	Alarm
-25	-80	9-16	230	-40 to +70	-55 to +85	2	TTL Low

Notes:
1. The (output frequency/(reference frequency) must be an integer. The integer value N determines the phase noise at <100kHz offsets.
2. The reference power is required to fall within a 6 dB window over the specified power range. Higher operating power yields better phase noise performance.
3. Loop bandwidth setting based on reference noise characteristics, typically 10 kHz to 200 kHz.
4. Total power variation over entire operating temperature range.
5. HIgher output power is available. Please contact the factory for more information.
6. Not applicable to Rugged Ultra Reliable DRO products.
7. Rugged Ultra Reliable DRO products measure 2.350" x 2.000" x 0.700".

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Phase-Locked DROs - Internal Reference
Specification Performance

Low Phase Noise Excellent Frequency Stability Low Current High Power

June-04

8B series		MODEL													
	Size (2)	2.000" x 1.833" x 1.280"													
Specification	Units	LO-0102-X8B	LO-0107-X8B	LO-0113-X8B	LO-0118-X8B	LO-0125-X8B	LO-0131-X8B	LO-0138-X8B	LO-0145-X8B	LO-0152-X8B	LO-0160-X8B	LO-0168-X8B	LO-0177-X8B	LO-0186-X8B	LO-0196-X8B
Frequency	GHz	.998 - 1.049	1.050 - 1.102	1.103 - 1.159	1.160 - 1.218	1.219 - 1.281	1.282 - 1.347	1.348 - 1.416	1.417 - 1.488	1.489 - 1.565	1.566 - 1.645	1.646 - 1.729	1.730 - 1.818	1.819 - 1.911	1.912 - 2.009
RF power (1)	dBm	12-15	12-15	12-15	12-15	12-15	12-15	12-15	12-15	12-15	12-15	12-15	12-15	12-15	12-15
Phase noise	(1 Hz BW)														
@100 Hz	dBc/Hz	-94	-93	-93	-92	-92	-92	-91	-91	-90	-90	-89	-89	-89	-88
@1 kHz	dBc/Hz	-118	-118	-118	-117	-117	-117	-116	-116	-115	-115	-114	-114	-114	-113
@10 kHz	dBc/Hz	-129	-128	-128	-127	-127	-127	-126	-126	-125	-125	-124	-124	-124	-123
@100 kHz	dBc/Hz	-140	-139	-139	-138	-138	-138	-138	-137	-136	-136	-135	-135	-135	-134
@ 1 MHz	dBc/Hz	-144	- 144	- 144	- 144	- 144	- 144	- 144	- 144	- 144	- 144	- 144	- 144	- 144	- 144

Other Parameters

Harmonics dBc	Spurious dBc	Supply Voltage V	Supply Current mA	Warm-up Current mA	Temperature		Stability Over Temperature (p-p)		Aging	Reference Tuning
					Operating ºC	Storage ºC	Frequency ppb	Power dB	ppm/10years	ppm
-25	-70	11.4 - 12.6	460	605	-40 to +70	-55 to +85	+/- 500	2	+/- 2	+/- 2.5

Notes: 1. Higher output power is available. Please contact the factory for more information.
2. Rugged Ultra Reliable versions are available. Contact the factory for more information.

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Specification Performance

Low Phase Noise Excellent Frequency Stability Low Current High Power

June-04

4B series	Size (2)	MODEL 2.000" x 1.833" x 1.280"													
Specification	Units	**LO-020-X4B**	**LO-021-X4B**	**LO-022-X4B**	**LO-023-X4B**	**LO-024-X4B**	**LO-026-X4B**	**LO-027-X4B**	**LO-029-X4B**	**LO-030-X4B**	**LO-032-X4B**	**LO-033-X4B**	**LO-035-X4B**	**LO-037-X4B**	**LO-039-X4B**
Frequency	GHz	1.955 - 2.097	2.098 - 2.205	2.206 - 2.318	2.319 - 2.437	2.438 -2.562	2.563 -2.693	2.694 - 2.831	2.832 - 2.976	2.977 - 3.129	3.130 - 3.290	3.291 - 3.458	3.459 - 3.636	3.637 - 3.822	3.823 - 4.018
RF power (1)	dBm	12-15	12-15	12-15	12-15	12-15	12-15	12-15	12-15	12-15	12-15	12-15	12-15	12-15	12-15
Phase noise	(1 Hz BW)														
@100 Hz	dBc/Hz	-88	-87	-87	-86	-86	-86	-85	-85	-84	-84	-83	-83	-83	-82
@1 kHz	dBc/Hz	-113	-112	-112	-111	-111	-111	-110	-110	-109	-109	-108	-108	-108	-107
@10 kHz	dBc/Hz	-123	-122	-122	-121	-121	-121	-121	-120	-120	-119	-119	-118	-118	-117
@100 kHz	dBc/Hz	-134	-133	-133	-132	-132	-132	-131	-131	-130	-130	-129	-129	-129	-128
@ 1 MHz	dBc/Hz	-144	- 144	- 144	- 144	- 144	- 144	- 144	- 144	- 144	- 144	- 144	- 144	- 144	- 144

Other Parameters

Harmonics dBc	Spurious dBc	Supply Voltage V	Supply Current mA	Warm-up Current mA	Temperature		Stability Over Temperature (p-p)		Aging	Reference Tuning
					Operating ºC	Storage ºC	Frequency ppb	Power dB	ppm/10years	ppm
-25	-70	11.4 - 12.6	460	605	-40 to +70	-55 to +85	+/- 500	2	+/- 2	+/- 2.5

Notes: 1. Higher output power is available. Please contact the factory for more information.
2. Rugged Ultra Reliable versions are available. Contact the factory for more information.

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Specification Performance

Low Phase Noise Excellent Frequency Stability Low Current High Power

June-04

2B series	Size (2)	MODEL 2.000" x 1.833" x 1.280"													
Specification	Units	**LO-040-X2B**	**LO-043-X2B**	**LO-045-X2B**	**LO-047-X2B**	**LO-049-X2B**	**LO-052-X2B**	**LO-055-X2B**	**LO-058-X2B**	**LO-061-X2B**	**LO-064-X2B**	**LO-067-X2B**	**LO-070-X2B**	**LO-074-X2B**	**LO-078-X2B**
Frequency	GHz	3.991 - 4.195	4.196 - 4.410	4.411 - 4.636	4.637 - 4.874	4.875 - 5.124	5.125 - 5.386	5.387 - 5.662	5.663 - 5.953	5.954 - 6.258	6.259 - 6.579	6.580 - 6.916	6.917 - 7.271	7.272 - 7.644	7.645 - 8.036
RF power (1)	dBm	12-15	12-15	12-15	12-15	12-15	12-15	12-15	12-15	12-15	12-15	12-15	12-15	12-15	12-15
Phase noise	(1 Hz BW)														
@100 Hz	dBc/Hz	-82	-81	-81	-80	-80	-80	-79	-79	-78	-78	-77	-77	-77	-76
@1 kHz	dBc/Hz	-107	-106	-106	-105	-105	-105	-104	-104	-103	-103	-102	-102	-102	-101
@10 kHz	dBc/Hz	-117	-116	-116	-115	-115	-115	-117	-114	-113	-113	-112	-112	-112	-111
@100 kHz	dBc/Hz	-128	-127	-127	-126	-126	-126	-128	-125	-124	-124	-123	-123	-123	-125
@ 1 MHz	dBc/Hz	-144	- 144	- 144	- 144	- 144	- 144	- 144	- 144	- 144	- 144	- 144	- 144	- 144	- 144

Other Parameters

Harmonics dBc	Spurious dBc	Supply Voltage V	Supply Current mA	Warm-up Current mA	Temperature		Stability Over Temperature (p-p)		Aging	Reference Tuning
					Operating ºC	Storage ºC	Frequency ppb	Power dB	ppm/10years	ppm
-25	-70	11.4 - 12.6	460	605	-40 to +70	-55 to +85	+/- 500	2	+/- 2	+/- 2.5

Notes: 1. Higher output power is available. Please contact the factory for more information.
2. Rugged Ultra Reliable versions are available. Contact the factory for more information.

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Phase-Locked DROs - Internal Reference
Specification Performance

Low Phase Noise Excellent Frequency Stability Low Current High Power

June-04

B series		MODEL													
	Size (2)	2.000" x 1.883" x 1.280"													
Specification	Units	**LO-081-XB**	**LO-086-XB**	**LO-090-XB**	**LO-095-XB**	**LO-099-XB**	**LO-105-XB**	**LO-110-XB**	**LO-116-XB**	**LO-122-XB**	**LO-128-XB**	**LO-134-XB**	**LO-141-XB**	**LO-149-XB**	**LO-156-XB**
Frequency	GHz	7.981-8.389	8.390-8.819	8.820-9.271	9.272-9.747	9.748-10.250	10.251-10.770	10.771-11.320	11.321-11.900	11.901-12.520	12.521-13.160	13.161-13.830	13.831-14.540	14.541-15.290	15.291-16.070
RF power (1)	dBm	13-16	13-16	13-16	13-16	13-16	13-16	13-16	13-16	13-16	13-16	13-16	13-16	13-16	13-16
Phase noise	(1 Hz BW)														
@100 Hz	dBc/Hz	-76	-75	-75	-74	-74	-74	-73	-73	-72	-72	-71	-71	-71	-70
@1 kHz	dBc/Hz	-101	-100	-100	-99	-99	-99	-98	-98	-97	-97	-96	-96	-96	-95
@10 kHz	dBc/Hz	-111	-110	-110	-109	-109	-109	-108	-108	-107	-107	-106	-106	-106	-105
@100 kHz	dBc/Hz	-119	-118	-118	-117	-117	-117	-116	-116	-115	-115	-114	-114	-114	-113
@ 1 MHz	dBc/Hz	-144	-143	-143	-142	-142	-142	-141	-141	-140	-140	-140	-139	-139	-138

Other Parameters

Harmonics dBc	Spurious dBc	Supply Voltage V	Supply Current mA	Warm-up Current mA	Temperature		Stability Over Temperature (p-p)		Aging	Reference Tuning
					Operating ºC	Storage ºC	Frequency ppb	Power dB	ppm/10years	ppm
-45	-80	11.4 - 12.6	400	545	-40 to +70	-55 to +85	+/- 500	2	+/- 2	+/- 2.5

Notes: 1. Higher output power is available. Please contact the factory for more information.
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Phase-Locked DROs - Internal Reference Specification Performance

Low Phase Noise Excellent Frequency Stability Low Current High Power

June-04

C series		MODEL									
	Size (2)	2.000" x 1.500" x .1.125"								2.000" x 1.883" x 1.280"	
Specification	Units	**LO-164-XC**	**LO-173-XC**	**LO-182-XC**	**LO-191-XC**	**LO-201-XC**	**LO-211-XC**	**LO-222-XC**	**LO-233-XC**	**LO-245-XC**	**LO-258-XC**
Frequency	GHz	16.071-16.900	16.901-17.760	17.761-18.670	18.671-19.630	19.631-20.640	20.641-21.700	21.701-22.810	22.811-23.980	23.981-25.210	25.211-26.500
RF power (1)	dBm	13-16	13-16	13-16	13-16	13-16	13-16	13-16	13-16	7-10	7-10
Phase noise	(1 Hz BW)										
@100 Hz	dBc/Hz	-70	-69	-69	-68	-68	-67	-67	-67	-66	-66
@1 kHz	dBc/Hz	-95	-94	-94	-93	-93	-92	-92	-92	-91	-91
@10 kHz	dBc/Hz	-105	-104	-104	-103	-103	-102	-102	-102	-101	-101
@100 kHz	dBc/Hz	-113	-112	-112	-111	-111	-110	-110	-110	-109	-109
@ 1 MHz	dBc/Hz	-138	-137	-137	-136	-136	-135	-135	-135	-134	-134

Other Parameters

Harmonics dBc	Spurious dBc	Supply Voltage V	Supply Current mA	Warm-up Current mA	Temperature		Stability Over Temperature (p-p)		Aging	Reference Tuning
					Operating ºC	Storage ºC	Frequency ppb	Power dB	ppm/10 year	ppm
-45	-80	11.4-12.6	400	545	-40 to +70	-55 to +85	+/- 500	2	+/- 2	+/- 2.5

Notes: 1. Higher output power is available. Please contact the factory for more information.
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June-04

		MODEL									
D series	Size (2)	2.000" x 1.863" x 1.280"				2.000" x 1.500" x 1.125"					
Specification	Units	**LO-271-XD**	**LO-285-XD**	**LO-299-XD**	**LO-315-XD**	**LO-330-XD**	**LO-347-XD**	**LO-365-XD**	**LO-383-XD**	**LO-403-XD**	**LO-423-XD**
Frequency	GHz	26.501-27.840	27.841-29.250	29.251-30.730	30.731-32.290	32.291-33.920	33.921-35.640	35.641-37.440	37.414-39.340	39.341-41.330	41.331-43.420
RF power	dBm	7-10	7-10	7-10	7-10	6-9	6-9	6-9	6-9	6-9	6-9
Phase noise	(1 Hz BW)										
@100 Hz	dBc/Hz	-65	-65	-64	-64	-64	-63	-63	-62	-62	-61
@1 kHz	dBc/Hz	-90	-90	-89	-89	-89	-88	-88	-87	-87	-86
@10 kHz	dBc/Hz	-100	-100	-99	-99	-99	-98	-98	-97	-96	-96
@100 kHz	dBc/Hz	-108	-108	-107	-107	-107	-106	-106	-105	-105	-105
@ 1 MHz	dBc/Hz	-133	-133	-132	-132	-132	-131	-131	-130	-130	-130

Other Parameters

Harmonics dBc	Spurious dBc	Supply Voltage V	Supply Current mA	Warm-up Current mA	Temperature		Stability Over Temperature (p-p)		Aging	Reference Tuning
					Operating ºC	Storage ºC	Frequency ppb	Power dB	ppm/10 year	ppm
-45	-80	11.4-12.6	400	545	-40 to +70	-55 to +85	+/- 500	2	+/- 2	+/- 2.5

Notes: 1. Higher output power is available. Please contact the factory for more information.
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