

MXA X

N9020B

10 Hz 3.6 8.4 13.6 26.5 GHz



..... 3

..... 4

..... 6

..... 8

PowerSuite 11

..... 12

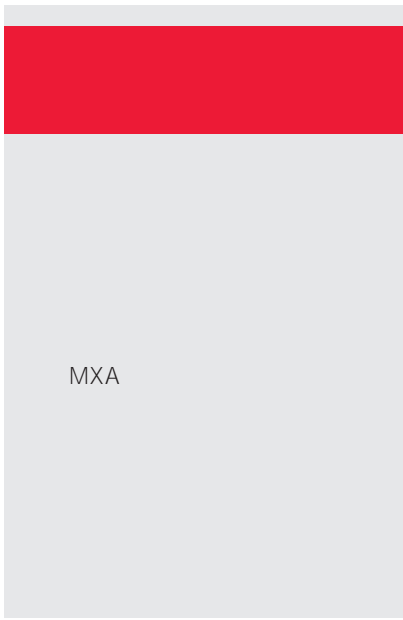
..... 13

IQ 15

IQ - B40 16

IQ - B85/B1A/B1X 17

RTSA 18



MXA

www.keysight.com/find/mxa_specifications

55

95% 20 30 95% 95%

 2

 20 30 95%

80%

0

–

– Auto Sweep Time Rules =Accy

– <10 MHz

–

– " Auto Align" Normal 30

– " Auto Align" Off Partial

 " " "

 " " "

Light " Auto Align" 1.4

MXA
N9020B MXA

MXA
www.keysight.com/find/mxa_specifications

N9020B MXA
5992-1256CHCN

		10 Hz	3.6 GHz	10 MHz	3.6 GHz
503		10 Hz	8.4 GHz	10 MHz	8.4 GHz
508		10 Hz	13.6 GHz	10 MHz	13.6 GHz
513		10 Hz	26.5 GHz	10 MHz	26.5 GHz
526					
N					
0	1	10 Hz	3.6 GHz		
1	1	3.5	8.4 GHz		
2	2	8.3	13.6 GHz		
3	2	13.5	17.1 GHz		
4	4	17	26.5 GHz		
$\pm [(\quad \times \quad) + \quad + \quad]$					
		PFR		$\pm 1 \times 10^{-6} /$	
		$\pm 1 \times 10^{-7} /$		$\pm 1.5 \times 10^{-7} / 2$	
		PFR		$\pm 2 \times 10^{-6}$	
-20	30 ° C	$\pm 1.5 \times 10^{-8}$		$\pm 5 \times 10^{-8}$	
-	-	$\pm 4 \times 10^{-8}$		$\pm 1.4 \times 10^{-6}$	
		PFR		$\pm 1.9 \times 10^{-7}$	
1		$= \pm (1 \times 1 \times 10^{-7} + 5 \times 10^{-8} + 4 \times 10^{-8})$			
1	PFR	$= \pm 1.9 \times 10^{-7}$			
FM		(0.25 Hz x N) p-p 20 ms			
-	PFR	(10 Hz x N) p-p 20 ms			
-		N			
$\pm \quad \times \quad + 0.25 \% \times \quad + 5 \% \times \text{RBW} + 2 \text{ Hz} + 0.5 \times \quad ^1$					
$\pm \quad \times \quad + 0.100 \text{ Hz}$					
$\pm \quad \times \quad + 0.141 \text{ Hz}$					
0.001 Hz					
FFT					
		0 Hz	10 Hz		
		2 Hz			
-		$\pm 0.25 \% \times$		+	
-	FFT	$\pm 0.10 \% \times$		+	

1. / -1

	= 0 Hz 10 Hz		1 μ s 1 ms	6000 s 4000 s
	10 Hz 10 Hz FFT = 0 Hz		\pm 0.01 % \pm 40 % \pm 0.01 %	
		1 2		
	= 0 Hz FFT 10 Hz		-150 0	+500 ms 500 ms 0.1 μ s

-				FFT
-	FFT	100.0 ns 0	5.0 s 100.0 s	
-		33.3 ns p-p		

	1 - 40001			
--	-----------	--	--	--

	RBW			
-3.01 dB		1 Hz 3 MHz 10 %	4 5 6 8 MHz	
		1 Hz 750 kHz 820 kHz 1.2 MHz < 3.6 GHz CF		\pm 1.0 % \pm 0.044 dB \pm 2.0 % \pm 0.088 dB
		1.3 2 MHz < 3.6 GHz CF		\pm 0.07 dB
		2.2 3 MHz < 3.6 GHz CF		\pm 0.15 dB
		4 8 MHz < 3.6 GHz CF		\pm 0.25 dB

-3.01 dB				
- RBW		1 Hz 1.3 MHz		\pm 2 %

		4.1:1		
--	--	-------	--	--

EMI	CISPR	200 Hz 9 kHz 120 kHz 1 MHz		EMC
-----	-------	----------------------------	--	-----

EMI	461E	10 Hz 100 Hz 1 kHz 10 kHz 100 kHz 1 MHz		EMC
-----	------	---	--	-----

1				
		B1X		160 MHz
		B1A		125 MHz
		B85		85 MHz
		B40		40 MHz
		B25		25 MHz

	VBW			
		1 Hz 3 MHz 10 %	4 5 6 8 MHz	50 MHz
		\pm 6 %		

DANL +30 dBm									
DANL +30 dBm									
		0	70 dB	2 dB					
EA3									
		10 Hz	3.6 GHz						
-			0	24 dB	1 dB				
-	+			0	94 dB	1 dB			
+30 dBm 1 W									
		< 10 μs	< 1 %	+ 50 dBm	100 W	30 dB			
-			± 0.2 Vdc						
-			± 100 Vdc						
0.1 1 dB/ 0.1 dB									
		1	20 dB/	1 dB	10				
10									
dBm dBmV dBμV dBmA dBμA V W A									
95 (≈ 2)									
10 dB	20	30° C		=					
		20 Hz	10 MHz			± 0.6 dB		± 0.28 dB	
		10 MHz ¹	3.6 GHz			± 0.45 dB		± 0.17 dB	
		3.5	8.4 GHz			± 1.5 dB		± 0.48 dB	
		8.3	13.6 GHz			± 2.0 dB		± 0.47 dB	
		13.5	22.0 GHz			± 2.0 dB		± 0.52 dB	
		22.0	26.5 GHz			± 2.5 dB		± 0.71 dB	
0 dB			100 kHz	3.6 GHz			± 0.75 dB		± 0.28 dB
		3.5	8.4 GHz			± 2.0 dB		± 0.67 dB	
		8.3	13.6 GHz			± 2.3 dB		± 0.73 dB	
		13.5	17.1 GHz			± 2.5 dB		± 0.97 dB	
		17.0	22.0 GHz			± 2.5 dB		± 1.36 dB	
		22.0	26.5 GHz			± 3.5 dB		± 1.48 dB	
> 2 dB			50 MHz			± 0.20 dB		± 0.08 dB	
10 dB			20 Hz	3.6 GHz			± 0.3 dB		± 0.3 dB
		3.5	8.4 GHz			± 0.5 dB		± 0.5 dB	
		8.3	13.6 GHz			± 0.7 dB		± 0.7 dB	
		13.5	26.5 GHz			± 0.7 dB		± 0.7 dB	
1.	50 MHz			10 MHz	50 MHz	0.5 dB	10 MHz	20	50 MHz

10 dB				20	30 ° C	1 Hz	RBW	1 MHz	-10	-50 dBm,		
Auto Swp Time = Accy =												
							50 MHz			± 0.33 dB		
							20 Hz	3.6 GHz			± 0.33 dB +	
									± 0.23 dB	95	2	
											± 0.39 dB +	
VSWR ≥ 10 dB												
							10 MHz	3.6 GHz			< 1.2:1	
							3.6	8.4 GHz			< 1.5:1	
							8.4	13.6 GHz			< 1.6:1	
							13.6	26.5 GHz			< 1.9:1	
							10 MHz	3.6 GHz			< 1.7:1	
0 dB							3.6	8.4 GHz			< 1.8:1	
							8.4	13.6 GHz			< 2.0:1	
							13.6	26.5 GHz			< 2.0:1	
30 kHz RBW												
1 Hz							1.5 MHz RBW				± 0.05 dB	
1.6 MHz							3 MHz RBW				± 0.10 dB	
4 5 6							8 MHz RBW				± 1.0 dB	
-												
							-170	+30 dBm	0.01 dB			
							-	707 pV	7.07 V			
0 dB												
0 dB												
/												
0 dB												
-												
-10 dBm							-80 dBm				± 0.10 dB	
RMS												
							P03			100 kHz	3.6 GHz	
							P08			100 kHz	8.4 GHz	
							P13			100 kHz	13.6 GHz	
							P26			100 kHz	26.5 GHz	
							100 kHz	3.6 GHz			+20 dB	
							3.6	26.5 GHz			+35 dB	
							100 kHz	3.6 GHz			11 dB	
							3.6	8.4 GHz			9 dB	
							8.4	13.6 GHz			10 dB	
							13.6	26.5 GHz			15 dB	

1 dB							
		20	500 MHz	0 dBm	+3 dBm		
		500 MHz	3.6 GHz	3 dBm	+5 dBm		
		3.6	26.5 GHz	0 dBm	+4 dBm		
P03	P08	P13	P26	10 MHz	3.6 GHz	-14 dBm	
				3.6	26.5 GHz		
				-	100 kHz	20 MHz	-26 dBm
				-	> 70 MHz		-16 dBm

DANL

= Log 0dB = 1 Hz RBW 20 30 ° C

		10 Hz			-95 dBm
		20 Hz			-105 dBm
		100 Hz			-110 dBm
		1 kHz			-120 dBm
		9 kHz	1 MHz		-130 dBm
		1	10 MHz	-150 dBm	-153 dBm
		10 MHz	2.1 GHz	-151 dBm	-154 dBm
		2.1	3.6 GHz	-149 dBm	-152 dBm
		3.6	8.4 GHz	-149 dBm	-153 dBm
		8.3	13.6 GHz	-148 dBm	-151 dBm
		13.5	17.1 GHz	-144 dBm	-147 dBm
		17.0	20.0 GHz	-143 dBm	-146 dBm
		20.0	26.5 GHz	-136 dBm	-142 dBm

P03	P08	P13	P26	100 kHz	1 MHz	-149 dBm
				1	10 MHz	-161 dBm
				10 MHz	2.1 GHz	-163 dBm
				2.1	3.6 GHz	-162 dBm
				3.6	8.4 GHz	-162 dBm
				8.3	13.6 GHz	-162 dBm
				13.5	17.1 GHz	-165 dBm
				17.0	20.0 GHz	-163 dBm
				20.0	26.5 GHz	-157 dBm

NFE¹ DANL 95%

0	f > 20 MHz	9 dB	10 dB
1		8 dB	9 dB
2		10 dB	10 dB
3		9 dB	10 dB
4		9 dB	9 dB

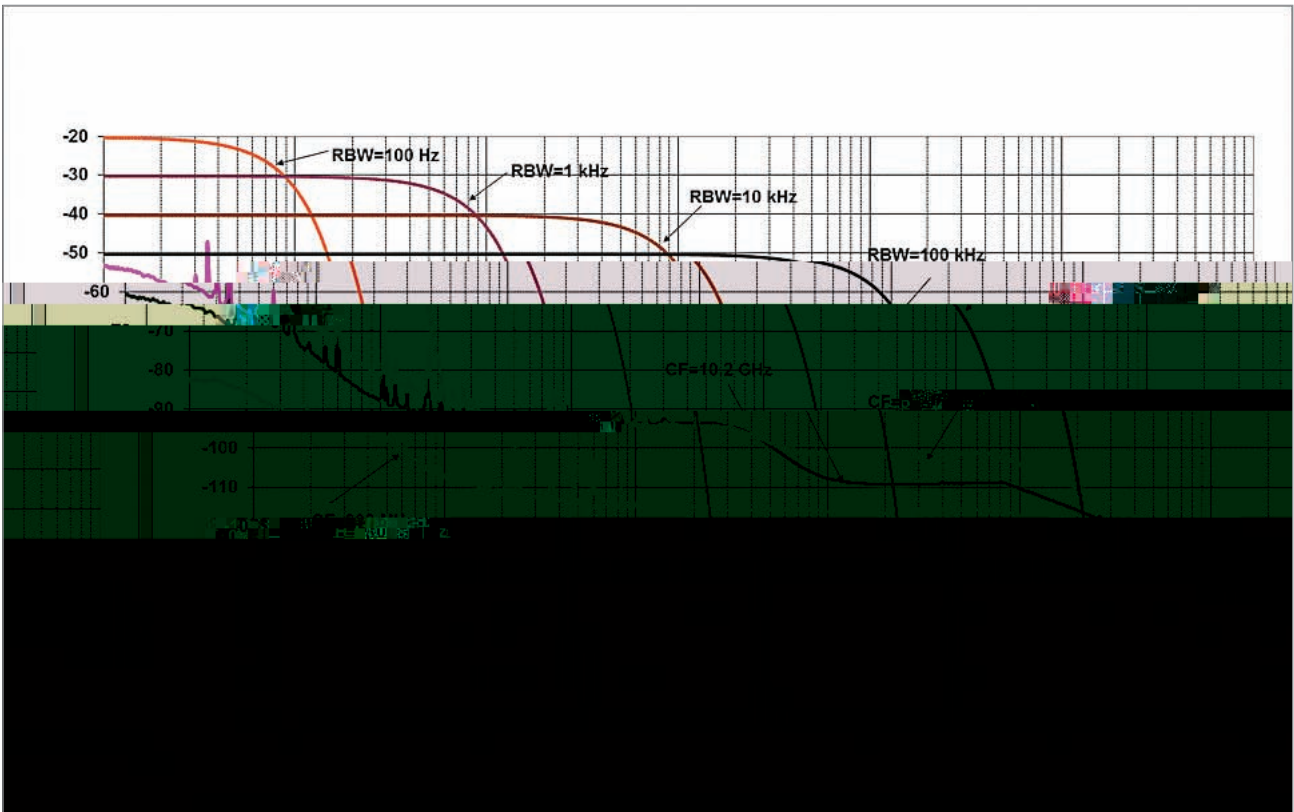
20 30 ° C DANL NFE

0	1.8 GHz	-159 dBm	-170 dBm
1	5.9 GHz	-157 dBm	-169 dBm
2	10.95 GHz	-157 dBm	-168 dBm
3	15.3 GHz	-151 dBm	-165 dBm
4	21.75 GHz	-146 dBm	-159 dBm

	0 dB	200 kHz	8.4 GHz	-100 dBm		
			FFT	-100 dBm		
		10 MHz	3.6 GHz	-80 dBc	-108 dBc	
		3.6	13.6 GHz	-78 dBc	-87 dBc	
		13.6	17.1 GHz	-74 dBc	-85 dBc	
		17.1	22 GHz	-70 dBc	-81 dBc	
		22	26.5 GHz	-68 dBc	-77 dBc	
LO		10 MHz	3.6 GHz	<-90 dBc		
f >	600 MHz					
f	10 MHz	-80 dBc + 20xlogN ¹				
SHI						
					SHI	
		10 MHz	1.1 GHz	-15 dBm	-60 dBc	+45 dBm
		1.1	1.8 GHz	-15 dBm	-56 dBc	+41 dBm
		1.75	6.5 GHz	-15 dBm	-80 dBc	+65 dBm
		6.5	11 GHz	-15 dBm	-70 dBc	+55 dBm
		11	13.25 GHz	-15 dBm	-65 dBc	+50 dBm
SHI						
		10 MHz	1.8 GHz	-45 dBm	-78 dBc	+33 dBm
P03	P08	P13	P26	1.8	13.25 GHz	+10 dBm
				-50 dBm	-60 dBc	
TOI						
	-30 dBm	> 5		20	30	
					TOI	TOI ()
		10	100 MHz	-84 dBc	+12 dBm	+17 dBm
		100	400 MHz	-90 dBc	+15 dBm	+20 dBm
		400	1.7 GHz	-92 dBc	+16 dBm	+20 dBm
		1.7	3.6 GHz	-92 dBc	+16 dBm	+19 dBm
		3.6	26.5 GHz	-90 dBc	+15 dBm	+18 dBm
		10	500 MHz	-98 dBc		+4 dBm
		500	3.6 GHz	-100 dBc		+5 dBm
-45 dBm		3.6	26.5 GHz	-70 dBc		-15 dBm

1.N

1				
20	30 ° C	CF = 1 GHz	10 Hz	
			100 Hz	-91 dBc/Hz
			1 kHz	
			10 kHz	-113 dBc/Hz
			100 kHz	-116 dBc/Hz
			1 MHz	-135 dBc/Hz
			10 MHz	



PowerSuite

20	W-CDMA 30 ° C	IS95 = 10 dB	± 0.82 dB	95%	± 0.23 dB
			± [/1000]		
	W-CDMA	ACLR			
- MS		ACLR	± 0.14 dB		± 0.18 dB
-			± 0.49 dB		± 0.42 dB
-			-73 dB		-79 dB
-			-78 dB		-82 dB
			1 - 6		
ACP			10 ms	(= 0.2 dB)	
			12		
	CCDF				
			0.01 dB		
			10		
				dBm	dBc
	TOI				%
W-CDMA	1	3.6 GHz			
-			81.3 dB		82.2 dB
-			-84.5 dBm		-89.5 dBm
	SEM				
cdma2000®	750 kHz				
-	30 kHz RBW		78.6 dB		84.8 dB
-			-99.7 dBm		-104.7 dBm
-			± 0.12 dB		
3GPP W-CDMA	2.515 MHz				
-	30 kHz RBW		81.9 dB		88.1 dB
-			-99.7 dBm		-104.7 dBm
-			± 0.15 dB		

0 55 ° C

-40 70 ° C

EMC

EMC 2004/108/EC

- IEC/EN 61326-1 IEC/EN 61326-2-1
- CISPR Pub 11 1 A
- AS/NZS CISPR 11:2002
- ICES/NMB-001

ISM ICES-001

ISM NMB-001

2006/95EC

- IEC/EN 61010-1 3
- CSA C22.2 No. 61010-1-12
- UL 61010-1 3

2002/42/EC 1.7.4.2u

-
- LpA <70 dB
-
-
- ISO 7779

IEC 60068-2

MIL-PRF-28800F 3

100 120 V, 50/60/400 Hz
220 240 V, 50/60 Hz

- 465 W
- 20 W

1280 x 768

269 10.60

80 GB

USB 2.0/3.0

16 kg 35

28 kg 62

177 mm 7.0

426 mm 16.8

368 mm 14.5

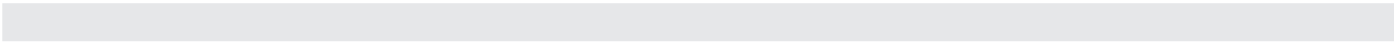
MXA

-		N	50	
EXM				
-		SMA		
-		50		
-		LO		
-		± 10 mA	10 µA	
-		322.5 MHz		
-	40 MHz	250.0 MHz		
-	85 125 160 MHz	300 MHz		
-		3.75 14.0 GHz		
IQ BBA ¹				
-	I Q I-Bar Q-Bar Cal	BNC		
-	Cal			
-		1 kHz 250 kHz		
-	4 I Q I- Q-	50 1 M		
-	2			
-		1130A 1131A 1132A 1134A		
-		1161A		
-		-35 dB 0 10 MHz		
-	50	-30 dB 10 40 MHz		
-	/	+15 Vdc 150 mA		± 7 %
-		-12.6 Vdc 150 mA		± 10 %
USB				
-	3	USB 2.0		
-		USB A		
-		1.2 A		
-		0.5 A		
10 MHz				
-		BNC 50		
-		0 dBm		
-		10 MHz± 10 MHz x		
-		BNC 50		
-		-5 10 dBm		
-		1 50 MHz		
-		± 2 x 10 ⁶		
1 2				
-		BNC		
-		> 10 k		
-		-5 5 V		

1. MXA

2. 5968-7141EN 5989-6162EN

E2668B E2669A E2675A



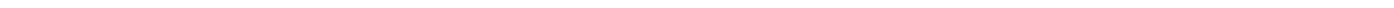
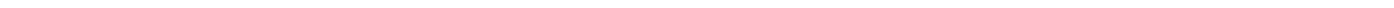
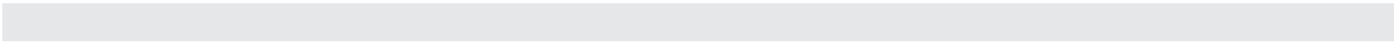
1 2

-
-
-

BNC
50
5 V TTL

-
-
-

VGA 15 D-SUB
XGA



I/Q

-		100 mHz	3 MHz
-	= 1 MHz	50 Hz	1 MHz
-	= 10 kHz	1 Hz	10 kHz
-	= 100 Hz	100 mHz	100 Hz

	Uniform	Hanning	Gaussian	Blackman	-	Blackman-Harris
	Kaiser Bessel	K-B 70 dB	K-B 90 dB	K-B 110 dB		

		10 Hz	10 MHz
B25		10 Hz	25 MHz
B40		10 Hz	40 MHz
B85		10 Hz	85 MHz
B1A		10 Hz	125 MHz
B1X		10 Hz	160 MHz

10 MHz

FFT 20 ° C 30 ° C

GHz		MHz			RMS
3.6		10		± 0.40 dB	0.04 dB
3.6 < f	26.5	10			0.25 dB
3.6 < f	26.5	10		1 ± 0.45 dB	0.04 dB

GHz		MHz			RMS
3.6		10		0.4 °	0.1 °
3.6 < f	26.5	10		1.0 °	0.2 °
3.6 < f	26.5	10		1 0.4 °	0.1 °

10 MHz

- IQ 4,000,000 IQ

ADC				
-	DP2	B40	MPB	100 MSa/s
-				90 MSa/s

ADC				
-	DP2	B40	MPB	16
-				14

B25 25 MHz

FFT 20 ° C 30 ° C

GHz		MHz			RMS
3.6		10	25	± 0.45 dB	0.051 dB
3.6 < f	26.5	10	25		0.45 dB
3.6 < f	26.5	10	25	1 ± 0.45 dB	0.05 dB

GHz		MHz			RMS
0.02	f < 3.6	25		0.6 °	0.14 °
3.6	f 26.5	25		4.5 °	1.2 °
3.6	f 26.5	25		1 1.9 °	0.42 °

1. MPB

I/Q

25 MHz				
				IQ
- IQ				4,000,000 IQ
89600				32 64
	DP2	B40	MPB	536 MSa 268 MSa 2 GB
				4,000,000 IQ ()
ADC				
-	DP2	B40	MPB	100 MSa/s
-				90 MSa/s
ADC				
-	DP2	B40	MPB	16
-				14

I/Q

B40

40 MHz

B40

B85 B1A B1X

B40 40 MHz				
		FFT	20 ° C	30 ° C
	GHz		MHz	RMS
0.03	f < 3.6		40	± 0.45 dB ± 0.08 dB
3.6	f 8.4		40	± 0.35 dB ± 0.08 dB
8.4	f < 26.5		40	± 0.46 dB ± 0.08 dB
				1 1
				0.2 ° 5 °
				0.05 ° 1.4 °
40 MHz				
SFDR				
-	± 12 MHz			-77 dBc
-	± 18 MHz			-74 dBc
-				-74 dBc
40 MHz				
				IQ
- IQ				4,000,000 (I/Q)
89600 VSA				32 64
	IQ			536 MSa 268 MSa 2 GB / x 1.25
- ADC				200 MSa/s
- IQ				x 1.25
ADC				12

1. MPB

IQ - B85/B1A/B1X

85/125/160 MHz

20 30 ° C

GHz		MHz		RMS		
0.15	< 3.6	85		± 0.6 dB	± 0.17 dB	0.05 dB
		140		± 0.6 dB	± 0.25 dB	0.05 dB
		160			± 0.2 dB	0.07 dB
3.6	8.4	85	1	± 0.73 dB	± 0.2 dB	0.06 dB
		140	1	± 0.8 dB	± 0.35 dB	0.06 dB
		160	1		± 0.3 dB	0.07 dB
> 8.4	26.5	85	1	± 1.10 dB	± 0.50 dB	0.2 dB
		140	1	± 1.40 dB	± 0.76 dB	0.2 dB
		160	1		± 0.5 dB	0.12 dB

GHz		MHz		RMS	
0.03	< 3.6	85		1.6°	0.54°
		140		3.9°	0.85°
		160		4.7°	1.23°
3.6		85	1	4.2°	0.93°
		160	1	5.3°	1.73°

EVM	EVM	MPB			
1	802.11ac OFDM	80 MHz	MCS8	89600 VSA	EQ
	5.21 GHz	0 dBm	0.23% (-52.7 dB)		EQ
			0.35% (-49.1 dB)		EQ
2	802.11ac OFDM	160 MHz	MCS8	89600 VSA	EQ
	5.25 GHz	0 dBm	0.30% (-50.4 dB)		EQ
			0.40% (-47.9 dB)		EQ

SFDR		
-	± 12 MHz	-72 dBc
-		
-	± 63 MHz	-71 dBc
-		
		-69 dBc

ADC		
CF	=	= 0 dB
-	0	-8 dBm
-	1 4	-7 dBm
CF	=	
-	0	-18 dBm
-	1 4	-17 dBm
CF		± 3 dB

1. MPB

IQ - B85/B1A/B1X

85/125/160 MHz

85/125/160 MHz					
- IQ	4,000,000 IQ				
- 89600 VSA					
	32				64
- IQ	536 MSa	2 ²⁹ Sa	268 MSa	2 ²⁸ Sa	2 GB
-	/(x 1.25)				
- ADC	400 MSa/s				
- IQ					
ADC	14				

RTSA ¹

RT1 RT2

- RT1	160 MHz						
- RT2	160 MHz						
	> 60 dB				²		
- RT1	11.42 ns						
- RT2	5.0 ns						
	100%				FMT		
- RT1	17.3 μs						
- RT2	3.57 μs						
FFT	100 μs						
	292,969 /						
					TQT	FMT	FMT + TQT

1. RTSA MXA RT1/RT2 N9020-90113)
2. StM " " Signal to Mask

X	---				5992-1316CHCN
N9020B MXA X	---				5992-1254CHCN

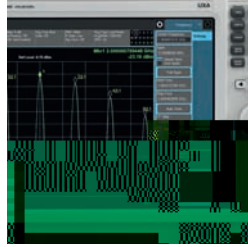
www.keysight.com/find/N9020B

X www.keysight.com/find/X-Series_Apps

X-Series www.keysight.com/find/X-Series

75

1939



1939

myKeysight

myKeysight
www.keysight.com/find/mykeysight



3



www.keysight.com/find/AssurancePlans
 10

www.keysight.com/go/quality



DEKRA ISO 9001:2008

Keysight Infoline
www.keysight.com/find/service

Keysight Infoline

www.keysight.com/find/channelpartners

www.keysight.com/find/mxa

www.keysight.com/find/contactus

: 800-810-0189 400-810-0189
 : 800-820-2816 400-820-3863
 : tm_asia@keysight.com

()

3
 : 86 010 64396888
 : 86 010 64390156
 : 100102

()

116
 : 86 28 83108888
 : 86 28 85330931
 : 610041

169 25
 : 852 31977777
 : 852 25069233

19 1350
 : 86 21 26102888
 : 86 21 26102688
 : 200080

6 3B-8
 : 86 755 83079588
 : 86 755 82763181
 : 518048

76
 1307
 : 86 20 38390680
 : 86 20 38390712
 : 510623

88
 D 501
 : 86 29 88861357
 : 86 29 88861355
 : 710068

2 8
 : 86 25 66102588
 : 86 25 66102641
 : 210005

1611
 : 86 512 62532023
 : 86 512 62887307
 : 215021

99
 18 A
 : 86 27 87119188
 : 86 27 87119177
 : 430071

MSD 196
 26 J+H
 : 86 21 26102888
 : 86 21 26102688
 : 200083