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MX269036A

Measurement Software for MediaFLO

MS2690A/MS2691A/MS2692A Signal Analyzer MS2690A/MS2691A/MS2692A Signal Analyzer

MX269036A Measurement Software for MediaFLO **Product Introduction**



Version 1.00

Anritsu Corporation



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MX269036A Measurement Software for MediaFLO

The MX269036A Measurement Software for MediaFLO measures the RF characteristic of MediaFLO signals standardized by United States TIA standard TIA-1099 and TIA-1099A. Installing this software in the MS269xA Signal Analyzer supports modulation analysis of MediaFLO signals, displaying both numerical results and graphs. Moreover, Tx tests of RF signals are supported when used in combination with standard MS269xA functions, such as ACLR, spectrum mask, spurious, etc.



The measurement software performs modulation analysis and the MS269xA Spectrum Analyzer performs basic RF measurements, such as spectrum mask and spurious.

MediaFLO is a trademark of Qualcomm Incorporated.



The Vector Signal Generator option can be installed in the MS269xA. The MS269xA is the ideal solution for evaluation using both standard signal sources and a spectrum analyzer.



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MX269036A Specifications

Specifications

- Standard: TIA-1099 TIA-1099-A
- Channel Bandwidth: 5 MHz, 6 MHz, 7 MHz, 8 MHz
- FFT Size: 2 K, 4 K, 8 K
- Cyclic Prefix: 1/16, 1/8, 3/16, 1/4
- Modulation: QPSK, 16 QAM/Layered (ER = 4), Layered (ER = 6.25)
- WID: 0 to 15
- LID: 0 to 15
- Slot to Interlace: Pattern 1, Pattern 2
- Wide-Area Data: Arbitrariness
- PPC/Reserved OFDM Symbol: Arbitrariness
- Measurement Frequency Range: 200 to 1600 MHz
- Measurement Level Range:
 - -26 to +30 dBm -38 to +10 dBm (at pre-amp ON)

Numerical Results Display

- Frequency Error [Hz] [ppm]
- Output Power
- MER DATA (TPC, OIS, Data), TDM1, WIC, LIC, TDM2
- Transmitter Timing

■ Graph Display

- Constellation
- MER vs. Subcarrier
- MER vs. Symbol
- Spectral Flatness (frequency response) Amplitude vs. Subcarrier Group Delay vs. Subcarrier
- Summary Carrier Suppression, MER Total, MER Data & OIS Channel, MER Pilot

MS269xA Measurement Functions

- Adjacent Channel Leakage Power
- Channel Power
- Occupied Bandwidth
- Spectrum Emission Mask
- Spurious Emission
- Burst Average Power

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MX269036A Basic Settings 1/2



Frequency	Measurement Range: 200 to 1600 MHz
Frequency	Setting Range: 100 MHz to main frame upper frequency
	Measurement Range
	–26 to +30 dBm (at pre-amp OFF or no pre-amp)
Loval Danga	–38 to +10 dBm (at pre-amp ON)
Level Range	Setting Range
	Pre-amp ON: (-80.00 + offset value) to (10.00 + offset value) dBm
	Pre-amp OFF: (-60.00 + offset value) to (30.00 + offset value) dB
Channel Bandwidth	5, 6, 7, 8 MHz

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MX269036A Basic Settings 2/2

MediaFLO MediaFLO		[4]			— [7] —		
پ Frequency	[1] Frequency	MediaFLO R Measure	MediaFLO The Modulation Analysis	MediaFLO 🚡 Analysis Time	MediaFLO T Modulation Analysis	MediaFLO Trace	MediaFLO race Mode
ب Amplitude	[2] Amplitude	Modulation Analysis	Time	End Symbol	Irace	Trace Mode	MER vs Subcarrier
Common Setting	[3] Common Setting			1197Symbol		Flatness scale	MER vs Symbol
يا Measure	[4] Measurement			FRAME OIS		0.50dB	Spectral Flatness
لي Marker	[5] Marker		6MHz	FRAME 1		Storage	Summary
پ Trigger	[6] Trigger			FRAME 2		Symbol Number 49Symbol	
				FRAME 3		Spectral Flatness Cal Value Save	
Accessory			8 Detail Settings	FRAME 4		Spectral Flatness Difference Cal On <u>Off</u>	
					2 of 2		Spectral Flatness Type <u>Amptd</u> GD
		1 of 2 🕞 🕻	1 of 2	0	2 of 2 🕞 🔿	0	0

See next page.

Analysis Time Length	First symbol to (Frame OIS, Frame 1, Frame 2, Frame 3, Frame 4) *Include TDM1, WIC, LIC and TDM2.
Graph display	Constellation, MER vs. Subcarrier, MER vs. Symbol Spectral Flatness (Amplitude vs. Subcarrier, Group Delay vs. Subcarrier)

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MX269036A Detail Settings

Media FLO						10/6/2009 13:33:02
Carrier Freq.	207 000 000 Hz	Input Level	-10.00 dBm	Trigger	SG Marker	HediaFLO
Channel Bandwidth	6MHz	ATT	4 dB	Delay	0.000 µs	
Result	🔛 Media F	LO			×	
MKR						
Symbol Number	Track	ing Mode		Estimation	-	
0				Manual		
TDM1				Estimation		
Subcarrier						
U		000.0				
NULL		SPC Presenc	e	Present		
NOLL ** *****		FFT Size		8K	-	
		Cyclic Prefix		1/8	-	
Q		Slot to Interla	ice	Pattern1		
MER vs Symbol		PPC Presence	e	Absent	-	
MKR	Sym	DDC / DS Num	hor	0		
		FFG/N3 Null	ber			
		Wide-area Da	ta Symbols	142		
				Max	limit = 142	
		WID		15	<u> </u>	
		LID		15	-	Set
60.00				Se	t Cancel	Cancel
Ref.Int Pre-	Amp Off		_			

Items	Setting Range/Specification
Detailed Parameter S	etting
Tracking Mode	Manual: Manual modulation setting
	Estimation: Automatic estimation modulation setting.
Modulation	QPSK, 16 QAM/Layered (ER = 4), Layered (ER = 6.25)
	*Can be set at Manual Tracking mode.
SPC Presence	Present, Absent
FFT Size	2, 4, 8 K
	*Can be set when SPC Presence is Present.
Cyclic Prefix	1/16, 1/8, 3/16, 1/4
Oyone i Tenx	*Can be set when SPC Presence is Present.
Slot to Interlace	Pattern 1, Pattern 2
	*Can be set when SPC Presence is Present.
	Present, Absent
PPC Presence	*The PPC/RS Number setting changes with PPC
	Presence.
	2, 6, 10, 14
PPC/RS Number	*This setting changes with SPC Presence, PPC
	Presence, and FFT Size.
	When SPC Presence = Absent,
	0 to { (Super frame Symbol Number - 18
Wide-area Data	- PPC or RS Number)/4 - 4}
Symbols	When SPC Presence = Presence,
	0 to (conforms with TIA-1099-A standard)
WID	0 to 15
LID	0 to 15



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Constellation and Numerical Results

When Trace Mode is MER vs. Subcarrier, MER vs. Symbol or Spectral Flatness, Constellation/Numerical value results are displayed at the top of the screen.



Some basic transmission test items, such as MER, frequency error, and output powers can be checked at this screen.

[1] Constellation

The Constellation of the symbol selected by the marker is displayed. In addition, when Subcarrier is selected by the

marker, I/Q coordinates and Subcarrier information at the position are displayed.

[2] Numerical result

Frequency Error:	Frequency error of input signals to set frequency
Output Power:	Average power of each bandwidth
MER DATA:	Data Symbol MER (except TDM1,
	WIC, LIC, TDM2, PPC, RS and
	SPC)
MER TDM 1:	TDM Pilot 1 MER
MER WIC:	WIC MER
MER LIC:	LIC MER
MER TDM 2:	TDM Pilot 2 MER
Transmitter Timing	: Time difference of first frame
	position vs trigger
	(when trigger set)



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Summary

The following measurement results as well as numerical results on the previous slide are displayed as a summary in one screen.

🖊 Media FLC)					10/11/2009 18:10:34
Carrier Fred	q. 207 0	00 000 Hz	Input Level	-10.00 dBm		MediaFLO 👘
Channel Ba	andwidth	6MHz	ATT	4 dB		
						MER vs Subcarrier
Result						
Frequ	ency Error			0.02 Hz		MER vs Symbol
				0.000 ppm		
Outpu	it Power			-7.28 dBm		
						Spectral Flatness
Summon						
Summary				Page No.	171	Summary
Carrie	r Suppression			53.06 dB		-
				00.00 42		
MER	DATA			53.90 dB		
				62.72 dB		
				61.23 dB		
	TDM2			56 40 dB		
	PPC			**.** dB		
	SPC			**.** dB		
				50 04 JB		
	DATA & OIS CI	annel		53.91 dB		
	Pilot			53.90 dB		
				55.55 dB		
Ref.Int	Pre-Amp C	ff				

Carrier Suppression: Carrier Suppression from WIC to End Symbol MER Total: MER to MER DATA & OIS Channel and MER Pilot MER DATA & OIS Channel: MER to Wide-area OIS, Wide-area DATA, Local-area OIS, and Localarea DATA MER Pilot: MER to Pilot Channel

Numerical results, such as Carrier Suppression and MER can be checked with the list.



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MER vs. Subcarrier

This displays thee MER vs. Subcarrier graphs (horizontal axis = Subcarrier, vertical axis = MER) at the bottom of the screen.



Subcarrier (frequency direction)

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MER vs. Symbol

This displays the MER vs. Symbol graph (horizontal axis = Symbol, vertical axis = MER) for one super-frame at the bottom of the screen.



Symbol (time direction)

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Spectral Flatness

A graph of Amplitude vs. Subcarrier (horizontal axis = Subcarrier, vertical axis = Amplitude) and Group Delay vs. Subcarrier (horizontal axis = Subcarrier, vertical axis = Group delay) can be selected.



The frequency response (Amplitude and Group delay) can be checked.

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Spectral Flatness > Frequency Response Difference Calculation

This calculates and displays the difference of the measurement results versus reference signals. When checking the frequency responses of various devices, this eliminates deterioration of basic signals, so true product performance can be measured.



When the frequency response of various devices (Gap filler, Parts) is measured, deterioration in the reference signal can be excluded to measure the true product performance.

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[Merit 1] Using MX269036A

Basic tool for transmission performance tests - Constellation -

The Constellation function can be used as a troubleshooting tool for:

Point spread: C/N deterioration, etc.

Variation of amplitude direction: AGC oscillation, etc.

Phase rotation: Carrier frequency difference, symbol clock difference, etc.



Normal



C/N Deterioration

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[Merit 2] Using MX269036A

Check noise in channel band! - MER vs. Subcarrier -

The noise of each Subcarrier (interference wave, etc.) hidden in the channel band can be checked.



The presence of noise in the channel band cannot be checked using a spectrum display.



The presence of noise can be checked using MER vs. Subcarrier, because MER deteriorates at the noise part.

This is useful for checking noise affecting the circuit as well as signal quality in the field.

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[Merit 3] Use of MX269036A

Check faults at specific symbols - MER vs. Symbol -

Time and partial deterioration of each symbol in one super-frame can be checked. The Constellation set by the marker in the MER vs. Symbol graph is displayed on the screen. The position and information about the subcarrier causing symbol deterioration can be checked by switching to the MER vs. Subcarrier graph.

A Spect	rum Anal	yzer										10/11/2009 19:21:39
							R	ЗW	3MHz	ATT	10dB	💆 Spectrum Analyzer 🚡 Span
R	eference	Level 0	.00dBm						RMS	1001	points	Span
0.0												0Hz
							Span =					
-10.0							0	Hz				Full Span
-20.0												
-30.0												Zero Span
-40.0												
-50.0												
-60.0												
-70.0												Couple
-80.0												Time/Frequency Domain <u>On</u> Off
-90.0												
-100.0												
Delay	0s			Time Sp	an 1.0s				Freq. 2	207.000 0	00MHz	Frequency Band ^b Mode
AW off		В-	05	C -	D	_	3-		[-		Normal
Ref.Int		Pre-Amp										G

The presence of noise cannot be checked using a spectrum analyzer time domain display (0 spans).



The presence of the noise can be checked using MER vs. Symbol, because MER deteriorates at the noise part.

This is useful for checking errors at specific symbols and noise affecting the circuit.

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[Merit 4] Built-in Vector Signal Generator (Option) - Best solution for gap filler and parts tests-

The Vector Signal Generator option can be installed in the MS269xA. The MS269xA is the ideal solution for evaluation using both standard signal sources and a spectrum analyzer.



The MS269xA-020 generates some waveform patterns using IQ data (IQ samples*) offered at the FLO Forum web site, and outputs some MediaFLO signals.

*Offered by FLO Forum to members at http://www.floforum.org/

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[Merit 5] MX269036A and FLO MER GUI - Correlation with FLO Forum MER GUI -

The MS269xA has a 31.25-MHz band FFT analyzer as standard. It can be used in with the FLO MER GUI offered at the FLO Forum web site.



[Merit 6] Standard Built-in Signal Analyzer Function

- Remote troubleshooting using same captured data -



The signal analyzer function can capture and save the RF signal to an internal or external hard disk, so the spectrum can be recreated and confirmed by reading the saved data at other remote R&D and manufacturing plants. In addition, data saved at product shipment can be read and re-verified if a post-shipment problem occurs.

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Ordering Information

Model/Order No.	Name
	Main Frame
MS2690A	Signal Analyzer (50 Hz to 6.0 GHz)
MS2691A	Signal Analyzer (50 Hz to 13.5 GHz)
MS2692A	Signal Analyzer (50 Hz to 26.5 GHz)
	Software Options
MX269036A	Measurement Software for MediaFLO (CD-ROM, License and Instruction manual)
	Optional Accessories
W3313AE	MX269036A Measurement Software for MediaFLO
	Operation Manual (Operation, Printed Version)
W3314AE	MX269036A Measurement Software for MediaFLO
	Operation Manual (Remote, Printed Version)



Note

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