

MT82 (30KHz~40GHz)
Microwave Wideband Externally Modulated
Transmitters

Technical Specification

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1.0 PRODUCT DESCRIPTION

MT82 series microwave optical transmitter, adopts external modulation technique, are able to transmit 40GHz microwave RF signal with long distance, wide bandwidth, and flat responsibility. They provide an outstanding linearity fiber optical communication for analogue and digital wideband microwave application. Due to avoidance of using expensive coaxial cable or wave guide, there will be no limitation in transmission distance, which improves the signal quality and reliability of the microwave communication. They can be widely applied in microwave communication system such as remote wireless; timing and reference signal distribution, telemetry, measurement and delay line etc as well as 10Gb/s and 40Gb/s high speed communication system.

MT82 adopts low noise, narrow linewidth CW DFB laser as light source; LiNbO3 external modular as signal modulation, no laser chirp, low dispersion distortion, high extinction ratio, Full-transparency operation mode. It can be applied in long distance and extra-long distance transmission after EDFA

MT82 series: With low noise microwave wideband amplifiers.

MT82 series operation wavelength optional:

C type: C-Band, 1528~1565nm.

L type: L-Band, 1570~1605nm.

T type: ITU-T standard wavelength is adjustable. T type is suitable for DWDM system.

MT82 series have four exterior structures available:

MX: module type, RS232 is an option, suitable for OEM, Exterior structure and size of the module as well as the PIN description can be specified by customers

2D: with RS232 and LCD display, suitable for laboratory use

1U, 3U: 19" casing, with RS232, SNMP, suitable for direct use in networks.

2.0 PRODUCT FEATURE

- Highest bandwidth 30KHz~40GHz
- Maximum frequency optional : 6GHz, 10GHz, 13GHz,15GHz, 18GHz, 20GHz, 40GHz
- External modulation technique, no laser chirp, low dispersion distortion, high extinction ratio, it can be applied in long distance transmission.
- Superior flatness of the RF response
- High dynamic range
- Full-transparency operation mode, suitable for all kinds of signal code, communication standard and network protocol
- ITU-T standard wavelength is adjustable. T type is suitable for DWDM system.
- RF input range: -65~-30dBm
- RF output 1dB compression: >20dB
- SBS threshold options: 6dBm, 13dBm
- Powerful RS232 communication interface, perfect SNMP function, LCD status display.
- Electromagnetic, RF, thunderbolt assistance
- Four exterior structures available
- It is superior in P/P ratio compared with Internally Modulated Optical transmitter
- High performance, stability、Low cost than DML
- Excellent P/P ratio

3.0 MAIN APPLICATION

- Antenna Remoting
- Long distance analog fiber-optic communications
- Cellular and PCS networks
- Military triband communications
- Tracking, telemetry and control (TT&C)
- High speed lightwave characterization
- Delay lines
- Phased arrays
- Microwave electronics
- High speed communication systems at 10Gb/s (OC-192), 40Gb/s (OC-768)

4.0 Technical index

Performance			Index			Supplement
			Min.	Typ.	Max.	
Optical feature	Operating wavelength	(nm)	1528		1564	C type: C-Band
			1570		1605	L type: L-Band
			1528		1605	T type: ITU-T, 100GHz
	Wavelength adjustable range	(nm)	-1.6		+1.6	T type (ITU-T)
	Wavelength adjustable mode		In steps $\pm 0.01\text{nm}$			T type (ITU-T)
	Wavelength stability	(Pm/°C)	-1		0	TC=20~70°C
	Optical output power	(dBm)	3.0			C03
			5.0			C05
			7.0			C07
			9.0			C09
			10.0			C10
	Side mode suppression ratio	(dB)	45			
	Optical isolation	(dB)	35			
	Extinction ratio	(dB)	20			
	Spectral linewidth	(MHz)		1	3	
	Relative intensity noise	(dB/Hz)			-150	2GHz to 20GHz
	SBS suppression	(dBm)			+6.0	S06: 6dBm
					+13.0	S13: 6&13dBm adj.
	Optical return loss	(dB)	50			
	Optical connector		SC/APC			Option FC/APC, LC/APC
RF feature	High frequency (cutoff -3dB)	(GHz)	6.0			MT82-06
			10.0			MT82-10
			15.0			MT82-16
			18.0			MT82-18
			20.0			MT82-20
			30.0			MT82-30
			40.0			MT82-40
	-3dB Low frequency	(KHz)		40		
	In-band ripple	(dB)			± 1.5	$\leq 13\text{GHz}$
					± 2.5	15~18GHz
					± 3.0	18~20GHz
					± 3.5	30-40GHz
	RF noise figure	(dB)		8	11	

	RF input range		(dB)	-60		-25	
	Output 1dB compression (P1dB)		(dB)	17	18		6GHz
				20	22		>6GHz
	Output third order intercept (IP3)		(dBm)	30	35		6GHz
				25	30		>6GHz
	RF input voltage standing wave ratio (VSWR)		(dB)		1.6:1	1.9:1	10GHz
					1.9:1	2.5:1	13~15GHz
					2.5:1	3.0:1	18~20GHz
RF input impedance		(Ω)		50			
Built-in RF coupling				AC			
RF output connector			SMA-F or K-connector				
General feature	Communication interface			RS232			
	SNMP interface			RJ45			Network management
	Power supply	220VAC	(V)	90	220	265	1RU, 3RU, 2D
		-48VDC		-30	-48	-72	1RU, 3RU
		+12VDC		+11	+12	+12.5	MX
	Power consume		(W)			15	A single plug-in or mode
	Operating temp.		(℃)	-10		+65	
	Storage temp.		(℃)	-40		+85	
	Relative humidity		(%)	5		95	
	Size	1U	(")	19×11.0×1.75			19" stander
		3U		19×14.5×5.25			
		2D		12.4×13.0×3.5			Desk-top
		M1	(mm)	145×75×28			With RS232
		M2		70×45×16			Without RS232

5.0 PRODUCTS SERIES

Model number	Highest frequency	Output power	SBS threshold	Operation wavelength	RF feature
MT82-06-C03-K/AC-S06	6.0GHz	3dBm	6dBm	C-Band (1528~1564nm)	K-connect or AC coupling, with wideband AMP
MT82-06-C05-K/AC-S06		5dBm			
MT82-06-C07-K/AC-S06		7dBm			
MT82-06-C09-K/AC-S13		9dBm	6, 13dBm adj.		
MT82-06-C10-K/AC-S13		10dBm			
MT82-10-C03-K/AC-S06	10.0GHz	3dBm	6dBm		
MT82-10-C05-K/AC-S06		5dBm			
MT82-10-C07-K/AC-S06		7dBm			
MT82-10-C09-K/AC-S13		9dBm	6, 13dBm adj.		
MT82-10-C10-K/AC-S13		10dBm			
MT82-15-C03-K/AC-S06	15.0GHz	3dBm	6dBm		
MT82-15-C05-K/AC-S06		5dBm			
MT82-15-C07-K/AC-S06		7dBm			
MT82-15-C09-K/AC-S13		9dBm	6, 13dBm adj.		
MT82-15-C10-K/AC-S13		10dBm			
MT82-18-C03-K/AC-S06	18.0GHz	3dBm	6dBm		
MT82-18-C05-K/AC-S06		5dBm			
MT82-18-C07-K/AC-S06		7dBm			
MT82-18-C09-K/AC-S13		9dBm	6, 13dBm adj.		
MT82-18-C10-K/AC-S13		10dBm			
MT82-20-C03-K/AC-S06	20.0GHz	3dBm	6dBm		
MT82-20-C05-K/AC-S06		5dBm			
MT82-20-C07-K/AC-S06		7dBm			
MT82-20-C09-K/AC-S13		9dBm	6, 13dBm adj.		
MT82-20-C10-K/AC-S13		10dBm			
MT82-30-C03-K/AC-S06	30GHz	3dBm	6dBm		
MT82-30-C05-K/AC-S06		5dBm			
MT82-30-C07-K/AC-S06		7dBm			
MT82-30-C09-K/AC-S13		9dBm	6, 13dBm adj.		
MT82-30-C10-K/AC-S13		10dBm			
MT82-40-C03-K/AC-S06	40.0GHz	3dBm	6dBm		
MT82-40-C05-K/AC-S06		5dBm			
MT82-40-C07-K/AC-S06		7dBm			
MT82-40-C09-K/AC-S13		9dBm	6, 13dBm adj.		
MT82-40-C10-K/AC-S13		10dBm			

Remark: 1、Please refer to ordering information

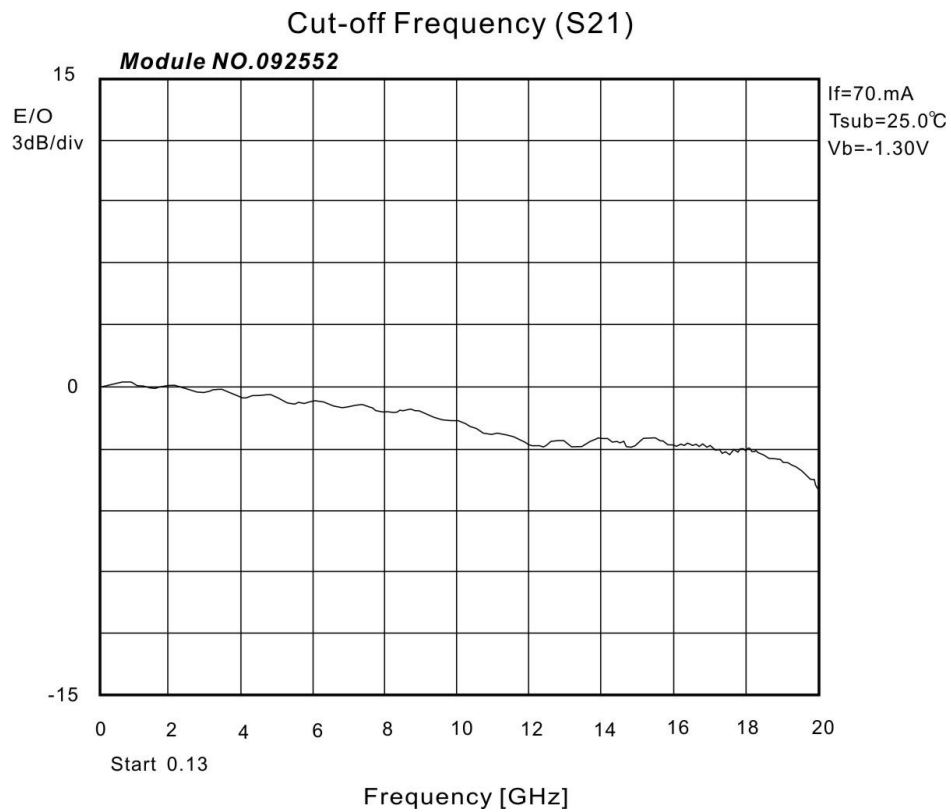
2、Operation wavelength options: L-Band or ITU-T standard wavelength

3、Exterior structure: MX、2D、1U、3U

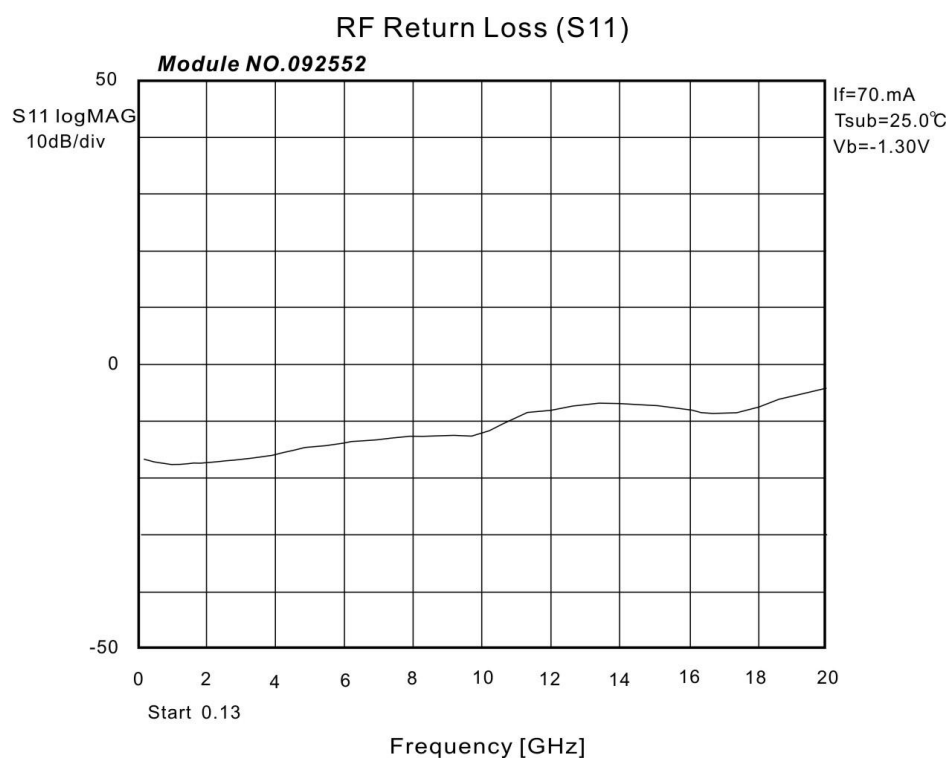
4、optical connector: FC/APC、LC/APC、SC/APC

6.0 Typical performance

6.1 MT80-10-C Cut-off Frequency (S21)

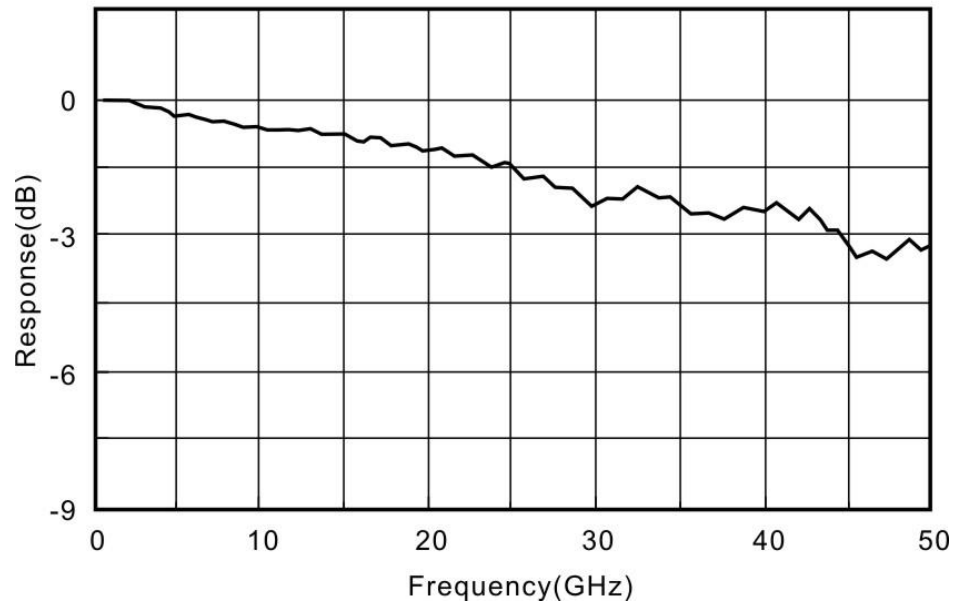


6.2 MT80-10-C RF Return loss (S11)



6.3 MT80-40-C Cut-off Frequency (S21)

Cut-off Frequency (S21)



7.0 ORDERING INFORMATION

7.1 1U, 3U, 2D ordering information

		MT 8 2 -		□ □ -		C 0 0 -		K /		A C -		S 0 6 -		□ □ -		F /		S A -		2 2							
Product series		Optical feature		RF feature		High frequency		Wavelength		Output power		RF connector		Output coupling		SBS		Exterior		Optical port location		Connector		Power supply			
MT	Microwave optical transmitter	5	DML	0	Without RF Amp	06	6GHz	C	C-Band	03	3dBm	G	GPO	DC	DC coupling	S06	6dBm	2D	Desk-top 2U	F	Front panel	FA	FC/APC	22	220VAC		
		6	EML			10	10GHz	L	L-Band	05	5dBm	S	SMA-F	AC	AC coupling	S13	6, 13dBm adj.	1U	1RU	B	Back panel	SA	SC/APC	11	110VAC		
MR	Microwave optical receiver	7	EML+EDFA	1	With RF Pre Amp	13	13GHz	T	ITU-T	07	7dBm	K	K-connector											LA	LC/APC	48	-48VDC
		8	EM-TX			15	15GHz			09	9dBm																
				2	With RF Limiting Amp	18	18GHz			10	10dBm																
						20	20GHz																				
						40	40GHz																				

7.2 Module type ordering information

Product series		Optical feature		RF feature		High frequency		Wavelength		Output power		RF connector		Output coupling		SBS		Module class		RS232		Connector		Connector type		Leads to fiber diameter		Leads to fiber length	
MT	Microwave optical transmitter	5	DML	0	Without RF Amp	06	6GHz	C	C-Band	03	3dBm	G	GPO	DC	DC coupling	S06	6dBm	M1	No.1	Y	With	FA	FC/APC	E	Enamel	1	Φ1mm	05	0.5m
		6	EML			10	10GHz	L	L-Band	05	5dBm	S	SMA-F	AC	AC coupling	S13	6, 13dBm adj.	M2	No.2	0	Without	SA	SC/APC	T	Tie-in	2	Φ2mm	10	1.0m
MR	Microwave optical receiver	7	EML+EDFA	1	With RF Pre Amp	13	13GHz	T	ITU-T	07	7dBm	K	K-connector																
		8	EM-TX			15	15GHz	09		9dBm																			
		2	With RF Limiting Amp	18	18GHz	10	10dBm																						
				20	20GHz																								
		40	40GHz																										