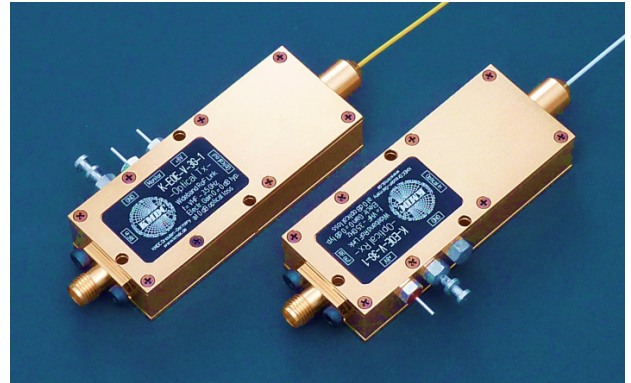
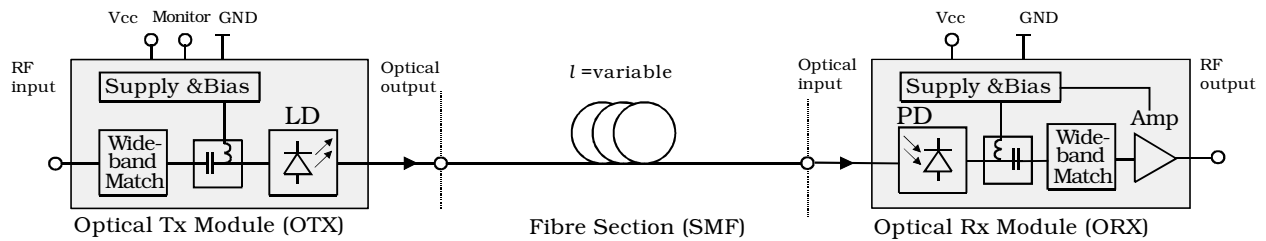


### Typical Applications

- The K-EOE-V-3G-1 is ideal for:
- analogue radio over fibre links
  - low loss RF signal distribution
  - antenna testing, remote antenna feed
  - general test and instrumentation



### Block Diagram



### Features

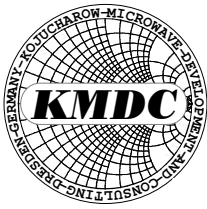
- broadband design:  $f=0.3-3.5$  GHz
- in- and output impedance: 50 Ohm
- simple integration: approx. 0 dB link loss electrical-to-electrical for short fibres
- high dynamic range
- optical wavelength: 1310 nm
- electrical gain flatness:  $< \pm 1$  dB max.
- very long sections of standard single mode fibre can be inserted
- modular design: uni-directional or bi-direction links can be configured
- call us for custom modifications or additional specifications

### Electrical & Optical Specifications

Test Conditions:

Supply voltage  $V_{cc}=8.0V$ ; optical attenuation  $L_{opt}=0$  dB (direct optical link); temperature  $T=25^{\circ}C$

Parameter	Min.	Typ.	Max.	Unit	Remark
RF operating frequency $f$ :	0.3		3.5	GHz	1)
Electrical link gain $G_{EOE}$ :	-2	0		dB	2), 3), 4)
Link gain flatness $\Delta G_{EOE}$ :		$\pm 0.5$	$\pm 1$	dB	
Port impedance $Z$ :		50		Ohm	
Input return loss $RL$ :	10	15		dB	
Output return loss $RL$ :	10	15		dB	
Input intercept point $IIP3$ :	+27	+30		dBm	5), $f=1$ GHz
	+22	+25		dBm	5), $f=2$ GHz
	+16	+19		dBm	5), $f=3.5$ GHz
Output noise power density $NPD$ :		-141		dBm/Hz	6), $f=1$ GHz
		-139		dBm/Hz	6), $f=2$ GHz
		-136		dBm/Hz	6), $f=3.5$ GHz
Wavelength of optical carrier $\lambda_0$ :	1300	1310	1320	nm	



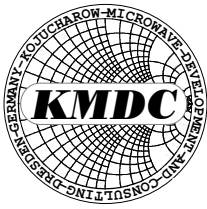
Supply voltage $V_{cc}$ :	7.5	8	16	V	
Supply current $I$ (OTX):		50	60	mA	
Supply current $I$ (ORX):		90	110	mA	
Optical CW output power $P_{opt}$ :	6	7	8	dBm	
Isolation of port Optical_out:	30			dB	
Optical $RIN$ :		-155	-150	dBc	
Monitor photodiode level:		500		mV	7)
Monitor load, recommended:	0.5			MOhm	
Fibre link length $l$ :	0		10	km	8)
Fibre pigtail length:		0.5		m	
Fibre type:		SMF-28			
Fibre sleeve:	800	900	1000	um	
Fibre bending radius	30			mm	
Temp.-range:	0		50	°C	
Warm-up time:		5		min.	

- 1) usable up to 4 GHz, extended range versions available upon request
- 2) reference planes: coaxial input RF\_in and coaxial output RF\_out
- 3) average gain value; optical link length  $l=0$  m; for SMF-28 or equivalent: optical loss at 1310 nm is approx. 0.35 dB/km resulting in additional electrical-to-electrical attenuation of approx. 0.7 dB per km inserted fibre
- 4) other link gain values available upon request – call for specifications
- 5) two tones, separation 2 MHz, equal level, sum input power -5 dBm max., please contact us for additional data
- 6) output noise density is predominately influenced by laser  $RIN$  (relative intensity noise) at the optical transmitter side; therefore, output noise density is mainly a function of RF frequency, laser current, optical attenuation and device temperature
- 7) range of voltage indicating range of optical output power will be provided for each unit
- 8) using a wavelength of 1310 nm and standard single mode fibre, this link is not limited by chromatic dispersion but rather attenuation, the max. value can be exceeded with limitations in electrical dynamic range

### Absolute Maximum Ratings

Parameter	Min.	Typ.	Max.	Unit	Remark
Supply voltage $V_{cc}$ :	0		16	V	
RF power into coax. ports:			13	dBm	
DC level into coax. ports:			16	V	
Optical power into fibre ports:			10	dBm	
Load to port Monitor:	100			Ohm	

Operation of this device beyond any of these limits may cause permanent damage and/or degraded performance.

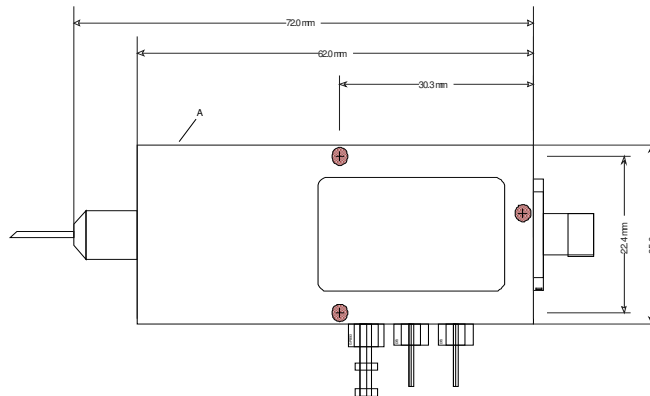


### Ports and Interfaces

Name	Function	Parameter
Vcc	supply	filtered feedthru
Monitor	laser diode monitor PD	filtered feedthru
GND	DC return path	case ground, solder pin
RF_in	RF input	SMA female
RF_out	RF output	SMA female
Optical_out	Optical transmitter output	SC angled PC/FC angled PC
Optical_in	Optical receiver input	SC angled PC/FC angled PC

### Mechanical Construction

The following general mechanical layout is used for each of the modules. The complete unit is incorporated in a dedicated milled RF enclosure with separate top and bottom shielding covers for very high EMI suppression.



Mechanical configuration of the module (OTX), milled aluminium enclosure, feedthru and ground pins, optical fibre and coaxial SMA (f) port. The side with marking A is without feedthru ports.

The dimensions are approx. 62x26x13 mm<sup>3</sup> plus connector, fibre stabilisation and DC feedthru. Mounting holes are provided for attachment with screws M2.5.

### Bi-Directional Link

If desired, a bi-directional Radio-over Fibre link can be constructed very easily. In this case, mount one OTX and one ORX directly side-by-side (see marking A) on a common base plate. The feedthru pins will not be obstructing. In addition, the optical and RF ports will be on their respective sides for optimum signal routing. Special mechanical configurations can be provided upon request.

### Order Information

Please specify:

- K-EOE-V-3G-1/SC for the standard product with connector type SC angled PC
- K-EOE-V-3G-1/FC for the standard product with connector type FC angled PC
- K-EOE-V-3G-1/X for requested custom design (mechanical or electrical)