AFBR-TUS500Z

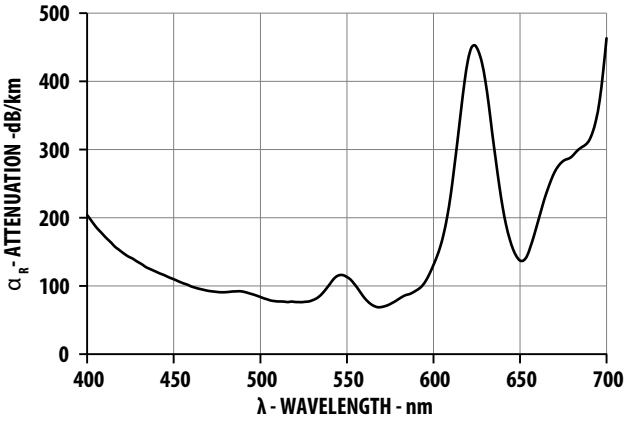
Transparent Jacket Plastic Optical Fiber

Data Sheet

Cable Description

The AFBR-TUS500Z plastic fiber optic cable is constructed of a single step-index fiber sheathed in a transparent polyethylene jacket. The cable is supplied in spools of 500m.

Figure 1 Typical POF Attenuation vs. Wavelength



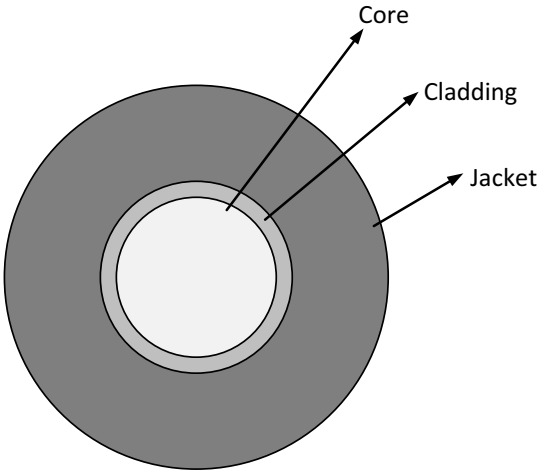
Features

- Compatible with Avago Versatile Link Family of connectors and fiber optic components
- 1.0/2.2 mm diameter Plastic Optical Fiber (POF) with 0.21dB/m typical attenuation (–40 °C to 85 °C)
- PMMA core
- Fluorinated polymer cladding
- Transparent polyethylene jacket
- Halogen free

Applications

- Arc flash event detection
- Light detection

Figure 2 AFBR-TUS500Z Structure



Plastic Optical Fiber Specifications: AFBR-TUS500Z

Absolute Maximum Ratings

Parameter	Symbol	Min.		Max.	Unit	Note
Recommended Storage Temperature	TS	–55		+85	°C	
Recommended Operating Temperature	TO	–40		+85	°C	
Recommended Installation Temperature	Ti	0		+70	°C	1
Short Term Tensile Force	FT			50	N	2, 3
Long Term Tensile Load	FT			1	N	2, 4
Bend Radius	r	30			mm	5, 6, 7
Humidity range	H			85	%	

NOTE

1. Installation temperature is the range over which the cable can be bent and pulled without damage. Below 0°C the cable becomes brittle and should not be subjected to mechanical stress.
2. Fail criteria for tensile force test: elongation higher than 5% of original length.
3. Short term: 30 mins.
4. Long term: 2 4 hours.
5. Bend angle is 90°. Bend radius is the radius of the mandrel around which the cable is bent.
6. Fail criteria for bend radius test: increase in attenuation higher than 0.5 dB.
7. Test duration: 24 hours.

Mechanical Characteristics, T_A = –40 °C to +85 °C unless Otherwise Specified

Parameter		Symbol	Min.	Typ.	Max.	Unit	Note
Numerical Aperture		NA		0.48			1
Diameter Core and Cladding		DC	0.94	1.00	1.06	mm	
Diameter Jacket		DJ	2.13	2.20	2.27	mm	
Refractive Index	Core	n		1.492			
	Cladding			1.412			
Mass per Unit Length				3.7		g/m	2

NOTE

1. Fiber length longer than 2 meters
2. Without connectors

Optical Characteristics, T_A = –40 °C to +85 °C unless Otherwise Specified

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Cable Attenuation Source: 650nm, LED, NA=0.5 (Source: AFBR-1529Z)	0	0.16	0.21	0.26	dB/m	
Capturing constant	C	1.5E-9	3E-9		m	1, 2
Propagation delay constant	l/v		5		ns/m	3

NOTE

1. The optical power P at the photo detector can be calculated as P = C × L × E / K with;
   P: Optical power on detector [W]
   C: Capturing constant [m]
   L: Illuminated length of fiber [m]
   E: Optical power density in illuminated area [W/m^2], halogen lamp used as light source
   K: Correction factor for transmission losses [1], calculated as: K=10^(A × L2/10)
   A: Transmission loss [dB/m]
   L2: Length of fiber between illuminated area and photo detector [m], i.e. wiring length.
   * Capturing constant determined with a fiber length of 12 m.
2. Minimum limit of the capturing efficiency is based on the calculation of the average value – 3 × standard deviation for 51-cm-long segments of AFBR-TUS500Z. Capturing efficiency was measured with 17-cm-long segments of AFBR-TUS500Z (17 cm is the diameter of the integrating sphere used for characterization). The 51-cm-long segment was achieved by averaging three measurements taken over 17-cm-long segments.
3. Propagation delay constant is the reciprocal of the group velocity for propagation delay of optical power. Group velocity is v=c/n, where c is the velocity of light in free space (3×10^8 m/s) and n is the effective core index of refraction.

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