

FTTH INTERIOR PATCH CORD SINGLE-CORE AND DUAL-CORE OPTICAL FIBER-SM9/125-G657A2

PRODUCT DOCUMENTATION REF.

5-RT-Patch Cord-all types

PRODUCT TYPES

Connector : SC, LC, FC

Diameter: 1.6mm $\varnothing$ /1.8mm $\varnothing$ /2mm $\varnothing$ /3mm $\varnothing$ or any customize demanding

Cable length: 0.6M,1M,1.5M,2M,3M ... (x) M

H.S.CODE

8544700000



SC APC Connector



SC UPC Connector



SC UPC Connector



SC / UPC



LC / UPC

LC / APC

SC/APC

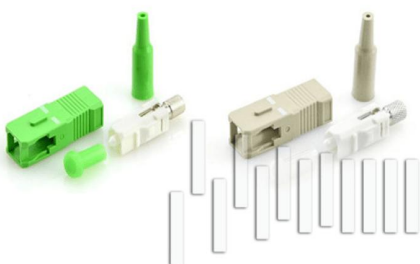


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1. Scope of application: Product type & order code

This standard refers to the national, industry standards, combined with the company's actual production and use of the development. This specification applies to the outsourcing procurement of company single-core dual-core optical fiber patch cord, pigtails.

Categories Code	Connector Type	Connector Code		Diameter Type Code	Diameter Code Range	
5. Patch cord	50-SC/APC- SC/APC	500		3mmø	50000-50099	50000-50099-SC/APC- SC/APC 3mmø
		501		1.8mmø	50100-50199	50100-50199-SC/APC- SC/APC 1.8mmø
		502		1.6mmø	50200-50299	50200-50299-SC/APC- SC/APC 1.6mmø
	51-SC/APC-SC/UPC	510		3mmø	51000-51099	51000-51099-SC/APC-SC/UPC 3mmø
		511		1.8mmø	51100-51199	51100-51199-SC/APC-SC/UPC 1.8mmø
		512		1.6mmø	51200-51299	51200-51299-SC/APC-SC/UPC 1.6mmø
	52-LC/APC-SC/APC Long connector	520		3mmø	52000-52099	52000-52099-LC/APC-SC/APC Long connector 3mmø
		521		1.8mmø	52100-52199	52100-52199-LC/APC-SC/APC Long connector 1.8mmø
		522		1.6mmø	52200-52299	52200-52299-LC/APC-SC/APC Long connector 1.6mmø
	53-LC/APC-LC/APC long connector	530		3mmø	53000-53099	53000-53099-LC/APC-LC/APC long connector 3mmø
		531		1.8mmø	53100-53199	53100-53199-LC/APC-LC/APC long connector 1.8mmø
		532		1.6mmø	53200-53299	53200-53299-LC/APC-LC/APC long connector 1.8mmø
	54-LC_UPC-LC_UPC long connector	540		3mmø	54000-54099	54000-54099-LC UPC-LC UPC-G657A2-3mmø
		541		1.8mmø	54100-54199	54100-54199-PC-LC UPC-LC UPC-G657A2-1.8mmø
		542		1.6mmø	54200-54233	54200-54233-PC-LC UPC-LC UPC-G657A2-1.6mmø
	55-LC_UPC-SC_UPC long connector	543		2mmø	54300-54399	54300-54399-PC-LC UPC-LC UPC-G657A2-2mmø
		550		3mmø	55000-55099	55000-55099-LC UPC-SC UPC-G657A2-3mmø
		551		1.8mmø	55100-55199	55100-55199-LC UPC-SC UPC-G657A2-1.8mmø
	56-LC_UPC-SC_APC long connector	552		1.6mmø	55200-55299	55200-55299-LC UPC-SC UPC-G657A2-1.6mmø
		560		3mmø	56000-56099	56000-56099-LC UPC-SC APC long connector 3mmø
		561		1.8mmø	56100-56199	56100-56199-LC_UPC-SC_APC long connector 1.8mmø
	57-LC/APC-LC/APC short connector	562		1.6mmø	56200-56299	56200-56299-LC_UPC-SC_APC long connector 1.6mmø
		570		3mmø	57000-57099	57000-57099-LC/APC-LC/APC short connector 3mmø
		571		1.8mmø	57100-57199	57100-57199-LC/APC-LC/APC short connector 1.8mmø
	58-all other types	572		1.6mmø	57200-57299	57200-57299-LC/APC-LC/APC short connector 1.6mmø
		580-LC/APC-SC/APC short connector		3mmø	58000-58020	58000-58020-LC/APC-SC/APC short connector 3mmø
				1.8mmø	58021-58041	58021-58041-LC/APC-SC/APC short connector 1.8mmø
				1.6mmø	58042-58062	58042-58062-LC/APC-SC/APC 1.6mmø -short connector
		581-LC/APC-SC/UPC short connector		3mmø	58100-58120	58100-58120-LC/APC-LC/APC 3mmø-short connector
				1.8mmø	58121-58141	58121-58141-LC/APC-LC/APC-G657A2-1.8mmø-short connector
				1.6mmø	58142-58162	58142-58162-LC/APC-LC/APC-G657A2-1.6mmø-short connector
		582-LC/UPC-LC/UPC short connector		3mmø	58200-58220	58200-58220-LC/UPC-LC/UPC -G657A2-3mmø-short connector
				1.8mmø	58221-58241	58221-58241-LC/UPC-LC/UPC -G657A2-1.8mmø-short connector
				1.6mmø	58242-58262	58242-58262-LC/UPC-LC/UPC -G657A2-1.6mmø-short connector
		583-SC/APC-LC/UPC -Short connector		3mmø	58300-58320	58300-58320-SC/APC- LC/UPC -G657A2-3mmø-short connector
				1.8mmø	58321-58341	58321-58341-SC/APC- LC/UPC -G657A2-1.8mmø-short connector
				1.6mmø	58342-58362	58342-58362-SC/APC- LC/UPC -G657A2-1.6mmø-short connector
		584-LC_UPC-SC_UPC-SM-G657A2--Short connector		3mmø	58400-58420	58400-58420-LC_UPC-SC_UPC -G657A2-3mmø-short connector
				1.8mmø	58421-58441	58421-58441-LC_UPC-SC_UPC -G657A2-1.8mmø-short connector
				1.6mmø	58442-58462	58442-58462-LC_UPC-SC_UPC -G657A2-1.6mmø-short connector
	59-Patch cord metal					

Configuration:



Note : Structure drawing just for reference, please check the following details.

Color write RAL 9010 or yellow, or on demanding

2. Reference materials

YD/T 1272.3-2005 Fiber optic connector Type SC
YD/T 1272.4-2007 Fiber optic connector Type FC
YD/T 1198-2002 Fiber optic connectors - Technical requirements of pin body

3. Material requirements

3.1 Single-core and dual-core optical cable

Table 1 Technical parameters table of Single-core, dual-core optical cable

Items	Technical Requirements			
	Single-mode single-core	Multi-mode single-core	Single-mode dual-core	Multi-mode dual-core
Optical fiber model	G657A2	A1a、A1b	G657A2	A1a、A1b
Cable outer sheath material/color	PVC&LZSH/yellow	PVC&LZSH/orange	PVC&LZSH/yellow	PVC&LZSH/orange
Outer diameter of the Tight buffered fiber	0.9mm	0.9mm	0.9mm	0.9mm
the Tight buffered fib material/color	PVC&LZSH/White	PVC&LZSH/White	PVC&LZSH/White	PVC&LZSH/White
Optical cable strength member	Aramid	Aramid	Aramid	Aramid

3.2 Requirements for Single-mode inserted core

Table 2 Technical parameters table of Single-mode inserted core

Items	Requirements	
Insert core model	SC/PC Single mode	SC/APC Single mode (The step type cone)
Insert core concentricity (um)	≤ 1.0	≤ 1.0

3.3 requirements for patch cord spare parts

Table3 Technical parameters table of Single-mode spare parts

applications	Model	Colors of tail set	Colors of shell	Dust cap
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single-core Optical fiber patch cord pigtaills	SC/UPC/SM	blue	blue	Transparent color
	FC/UPC/SM	black	metallic	Transparent color
	SC/APC/SM	green	green	green
	FC/APC/SM	green	metallic	green
	SC/UPC/MM	creamy white	creamy white	Transparent color
	FC/UPC/MM	black	metallic	Transparent color
multi-core Optical fiber patch cord pigtaills	SC/UPC/SM	blue	blue	Transparent color
	FC/UPC/SM	black	metallic	Transparent color
	SC/APC/SM	green	green	green
	FC/APC/SM	green	metallic	green
	SC/UPC/MM	creamy white	creamy white	Transparent color
	FC/UPC/MM	black	metallic	Transparent color
Parts and finished products appearance requirements: Fiber Connector should be smooth, clean, no oil, no scar and crack in appearance. The combination of all parts should be flat. Plug and adapter should be smoothly connected and easy to plug. Dust cap and insert core fit well with the appropriate elastic.				

3.4 Specifications for adapters. Optical fiber model: G657A2, or customized for G657A2, G657D

4. Product technical requirements

The optical performance of the cable assemblies shall be tested in accordance with IEC 61300-3-4 for Insertion Loss and IEC 61300-3-6 for Return Loss.

Characteristic		Singlemode termination	Multimode termination
IL	IEC61300-3-4	$\leq 0.30\text{dB}$	$\leq 0.30\text{dB}$
RL	IEC61300-3-6	$\geq 50\text{dB}/60\text{dB}(\text{APC})$	$\geq 20\text{dB}$

4.1 Performance requirements

Table4 Technical parameters table of Finished product performance index

The performance specifications		
Items		specifications
Insertion loss Return loss	SC	The insertion loss of any plug through a standard adapter with a standard plug $\leq 0.30\text{dB}$ (Contain repetitive), Return loss $> 50\text{dB}(\text{SC/UPC}) > 60\text{dB}(\text{SC/APC})$.
	FC	The insertion loss of any plug through a standard adapter with a standard plug $\leq 0.2\text{dB}$ (Contain repetitive) ; Return loss $> 50\text{dB}(\text{FC/UPC})$, $> 60\text{dB}(\text{FC/APC})$.
Cable length		Length according to the requirements of customer orders.

4.2 Mechanical and environmental performance requirements(unit: dB)

Table5 Technical parameters table of the connectors' mechanical and environmental performance

Serial number	Name of test	Conditions	Insertion variation	loss	Return variation	loss
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			FC	SC	FC、 SC
a	low temperature	low temperature: -25°C; duration : 96h; Temperature change rate: $\leq 1^{\circ}\text{C}/\text{min}$ (Not more than 5min average) ; For on-line monitoring of the sample;	≤ 0.2	≤ 0.2	<5
b	High temperature	High temperature: + 70°C; duration : 96h ; Temperature change rate : $\leq 1^{\circ}\text{C}/\text{min}$ (Not more than 5min average) For on-line monitoring of the sample;	≤ 0.2	≤ 0.2	<5
c	Temperature cycle	low temperature: Ta=-10°C; High temperature: Tb= + 60°C; The duration of the limit temperature : T1=T2=30min; Temperature change rate: $\leq 1^{\circ}\text{C}/\text{min}$ (Not more than 5min average) cycles: 5; On-line optical properties of the sample are not monitored	≤ 0.2	≤ 0.2	<5
d	Hot humid and (steady state)	temperature: + 40°C; Relative humidity: 90%~95%; duration: 96h; Temperature change rate: $\leq 1^{\circ}\text{C}/\text{min}$ (Not more than 5min average) On-line optical properties of the sample are not monitored	≤ 0.2	≤ 0.2	<5
e	vibration	Frequency range : 10~55HZ; Frequency sweep requirements : the sweep rate shall be one octave per minute with a tolerance of $\pm 10\%$; Amplitude: 0.75mmSingle amplitude; The duration of each direction : 30min; For on-line monitoring of the sample	≤ 0.1	≤ 0.1	<5
f	fall	Drop height: H=1m; Free oscillation of cable length : L=2.25m; The number of drops : 5 times; On-line optical properties of the sample is not monitored;	≤ 0.1	≤ 0.1	<5
g	repetitive	The number of plug: 10 times; For on-line monitoring of the sample	≤ 0.1	≤ 0.1	<5

h	Mechanical durability	The number of plug: 500 times; For on-line monitoring of the sample	≤ 0.2	≤ 0.2	< 5
i	cable tensile	load: 50N; Load time: 10min; Apply the load rate : 50N/min<rate<250N/min; Apply a load from point A to the connector plug: L=22cm~28cm; On-line optical properties of the sample are not monitored;	≤ 0.1	≤ 0.1	< 5
j	Cable twist	Load weight: 14.7N; Load A distance from the plug : L=22cm~28cm; Torsional rate: 10 times/min; Number of turns: 200 times; On-line optical properties of the sample is not monitored;	≤ 0.1	≤ 0.1	< 5
k	cable separability	The minimum tear force is not less than 3N, the maximum value is not more than 10N. The cable can be separated from the cable port easily by 200mm ; after separation, the optical fiber should be completely exposed and the colored layer did not peel off. The separated fibers should not be torn from the remaining cables by hand; the sheath at the reinforcement member shall be intact and free from cracks			

5. Patch cord length:

The length of the patch cord shall be measured from connector tip to connector tip unless otherwise specified in the Order. For pigtails, this shall be measured from the tip of the connector to the tip of the free end of the cable/fiber.

- a. Length of cable assembly (L)
 - L -0/+100mm (for L<0.5.m)
 - L -0/+150mm (for 0.5m<L<5m)
 - L -0/+200mm (for 5m<L<20m)
 - L $\pm 1\%$ (for L ≥ 20 m)
- b. Approx. coil diameter
 - >150mm (0 – 5 metres)
 - >250mm (>5m)

6. ENDFACE CRITERIA

The microscope systems for end face visual inspection should have following, or higher capability:

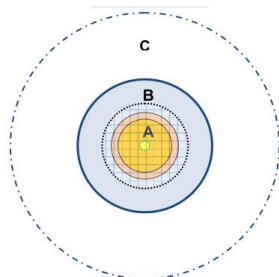
1. Detecting low-contrast defects of 2 microns in diameter and width.
2. Detecting low-contrast scratches of 0.5 microns in width and 0.02microns in depth.

The fiber end face criteria of each multimode and single mode termination in the cable assembly shall be as follows:

- A. CORE ZONE From 0 to 25 μ m (SM) or 65 μ m (MM)

B. CLADDING ZONE From 25µm (SM) or 65µm (MM) to 120µm

C. CONTACT ZONE From 130µm to 250µm



Visual inspection criteria (fiber optic terminations)

Defect	A	B	C
Defects (Single mode, PC)	none	no limit < 2µm 5 from 2 - 5µm none > 5µm	none ≥ 10µm
Defects (Single mode, APC)	none	no limit < 2µm 5 from 2 - 5µm none > 5µm	none ≥ 10µm
Defects (Multimode)	4 ≤ 5µm None > 5µm	no limit < 2µm 5 from 2 - 5µm none > 5µm	none ≥ 10µm
Scratches (Single mode, PC)	none	no limit < 3µm none > 3µm	no limit
Scratches (Single mode, APC)	< 4	no limit	no limit
Scratches (Multimode)	none	no limit < 5µm none > 5µm	no limit
Cracks	none	none	none
Epoxy Ring	acceptable if width less than 5µm		

Note 1: Defects refer to chips, pits and contamination.

Note 2: For scratches, the requirement refers to width. For pits it refers to the maximum diameter.

Note 3: All loose particles must be removed by cleaning. Non-removable loose particles must be within the criteria above to be acceptable for use.

Note 4: No cracks are allowed in the fiber area, diameter = 120µm

7. Endface Geometry Specification

Telcordia GR 326

The end face geometry of single mode and multi-mode terminations shall be tested in accordance with the requirements and meet the following criteria as given in the table below:

Geometry criteria for 1.25 and 2.5mm ferrule

Parameters	Acceptance Limit	
	PC	APC

Radius of Curvature (ROC)	5—25mm	5—12mm
Apex Offset	0—50um	0—50um
Fiber Protrusion	100nm	100nm
Fiber undercut	See figure	See figure
Angle (for $5 \leq R < 6$ mm)		$8^\circ \pm 0.50$
Angle (for $6 < R < 7$ mm)		$8^\circ \pm 0.40$
Angle (for $7 < R < 8$ mm)		$8^\circ \pm 0.35$
Angle (for $8 < R < 10$ mm)		$8^\circ \pm 0.30$
Angle (for $10 < R < 12$ mm)		$8^\circ \pm 0.25$

The fiber undercut shall meet the following criteria as given below for $R > 10$ mm; Undercut $\leq -0.02R^3 + 1.3R^2 - 31R + 325$, where R is the radius of curvature; For Radius 7mm to 10mm the undercut ≤ 125 nm

8. Thermal cycle test

Test Min allowable Tensile Strength for connector:

LC ≤ 70 N, SC ≤ 50 N, FC ≤ 50 N, Test time 2 second

9. Packaging, identification

Valve bag size : 18*19mm, selecting the corresponding box according to the length of the cable

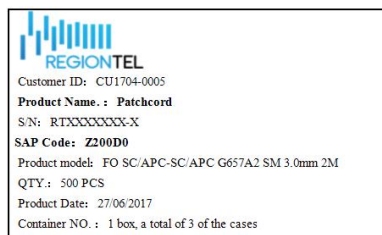
Valve bag tag size: Valve bag tag 40 mm * 70 mm, Material: coated paper.

As shown in figure 1:



Outer box label Size :100mm*50mm, material: dumb silver paper

As shown in figure 2:



The label name should clearly reflect the material name, specification model, product serial number, fiber performance parameters, the number of production and packaging

The finished product as shown in figure 3:



The dimensions of the box are external dimensions



Carton (length)



Carton (Width)

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