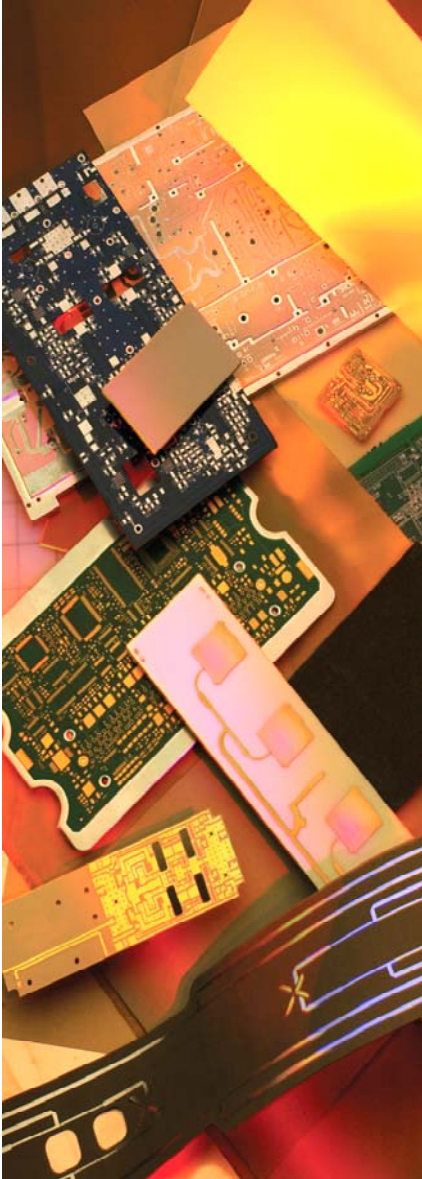


## POLYIMIDE Quartz LAMINATE AND PREPREG



**35NQ** is a pure polyimide laminate and prepreg system. Reinforced with woven Quartz fabric, combining the advantages of a reduced cure cycle, high temperature polyimide system ( $T_g \geq 250^\circ\text{C}$ ), with low dielectric constant and loss tangent ( $DK = 3.5$ , loss 0.009 at 1 MHz) for applications requiring operation at RF/Microwave frequencies. Polyimide Quartz materials also exhibit reduced in-plane CTE for expansion matched SMT applications.

### Features:

- $T_g$  greater than  $250^\circ\text{C}$
- Certified to the flammability requirements of UL-94 V-1
- Low z-expansion of 1.0% between  $50\text{-}260^\circ\text{C}$  provides excellent PTH reliability in process and in use
- Decomposition temperature of  $407^\circ\text{C}$  ensures excellent long term thermal stability
- Up to 50% or more reduction in cure time compared with traditional polyimide cycles
- Electrical and mechanical properties meeting the requirements of IPC-4101/60
- Toughened, non-MDA chemistry
- Compatible with lead-free processing
- RoHS/WEEE compliant
- Space Tested and Proven

### Typical Applications:

- SMT applications in thicker boards ( $>0.093''$ ) where the improved PTH reliability of polyimide is required
- RF or Microwave Applications such as microwave polarizers or other aerospace applications requiring low dielectric constant and loss with high temperature polyimide reliability

# Typical Properties:

**35NQ**

Property	Units	Value	Test Method
<b>1. Electrical Properties</b>			
Dielectric Constant <i>(may vary with Resin %)</i>			
@ 1 MHz	-	3.5	IPC TM-650 2.5.5.3
@ 1 GHz	-		IPC TM-650 2.5.5.9
Dissipation Factor			
@ 1 MHz	-	0.009	IPC TM-650 2.5.5.3
@ 1 GHz	-		IPC TM-650 2.5.5.9
Volume Resistivity			
C96/35/90	MΩ-cm	5 x 10 <sup>9</sup>	IPC TM-650 2.5.17.1
E24/125	MΩ-cm		IPC TM-650 2.5.17.1
Surface Resistivity			
C96/35/90	MΩ	8 x 10 <sup>9</sup>	IPC TM-650 2.5.17.1
E24/125	MΩ		IPC TM-650 2.5.17.1
Electrical Strength (typical)	Volts/mil (kV/mm)	1000 (40)	IPC TM-650 2.5.6.2
Dielectric Breakdown			
Arc Resistance	sec	165	IPC TM-650 2.5.1
<b>2. Thermal Properties</b>			
Glass Transition Temperature (Tg)			
TMA	°C	>250	IPC TM-650 2.4.24
DSC			
Decomposition Temperature (Td)			
Initial	°C	363	IPC TM-650 2.3.41
5%	°C	407	IPC TM-650 2.3.41
T260	min	>60	IPC TM-650 2.4.24.1
T288	min	>60	IPC TM-650 2.4.24.1
T300	min	11	IPC TM-650 2.4.24.1
CTE (x,y)	ppm/°C	9-10	IPC TM-650 2.4.41
CTE (z)			
< Tg	ppm/°C	50	IPC TM-650 2.4.24
> Tg	ppm/°C	150	IPC TM-650 2.4.24
z-axis Expansion (50-260°C)	%	1.1	IPC TM-650 2.4.24
<b>3. Mechanical Properties</b>			
Peel Strength to Copper (1 oz/35 micron)			
After Thermal Stress	lb/in	6	IPC TM-650 2.4.8
At Elevated Temperatures	lb/in	6	IPC TM-650 2.4.8.2
After Process Solutions	lb/in	6	IPC TM-650 2.4.8
Young's Modulus	psi	3 x 10 <sup>6</sup>	IPC TM-650 2.4.18.3
Flexural Strength	psi (kg/m <sup>2</sup> )	95,000 (6.7 x 10 <sup>7</sup> )	IPC TM-650 2.4.4
Tensile Strength	kpsi		
Compressive Modulus	kpsi		
Poisson's Ratio (x, y)	-	0.15	ASTM D-3039
<b>4. Physical Properties</b>			
Water Absorption (0.062")	%	0.25	IPC TM-650 2.6.2.1
Specific Gravity	g/cm <sup>3</sup>		ASTM D792 Method A
Thermal Conductivity	W/mK	0.2	ASTM E1461
Flammability	class	V-1	UL-94

## Availability:

Arlon Part Number	Glass Style	Resin %	Resin Flow	Minimal Pressed Thickness
35NQ354	Q-503	54 ± 3	132 ± 5%	5.5 mils

## Recommended Process Conditions:

Process inner-layers through develop, etch, and strip using standard industry practices. Use brown oxide on inner layers. Adjust dwell time in the oxide bath to ensure uniform coating. Bake inner layers in a rack for 60 minutes at 225°F - 250°F (107°C - 121°C) immediately prior to lay-up. Vacuum desiccate the prepreg for 8 - 12 hours prior to lamination.

### Lamination Cycle:

- 1) Pre-vacuum for 30 - 45 minutes
- 2) Control the heat rise to 8°F - 12°F (4°C - 6°C) per minute between 150°F and 250°F (65°C and 121°C)

Panel Size		Pressure	
in	cm	psi	kg/sq cm
12 x 18	40 x 46	275	19
16 x 18	30 x 46	350	25
18 x 24	46 x 61	400	28

- 3) Product temperature at start of cure = 410°F (210°C).
- 4) Cure time at temperature = 1.5 - 2.0 hours  
NOTE: for sequential lamination use 60 minutes for the first lamination and 90 minutes for the final.
- 5) Cool down under pressure at ≤ 12°F/min (6°C/min)

Drill at 350 SFM. Diamond drills are recommended for Quartz reinforced product. Conventional bits only give 25 hits/drill average. Diamond bits typically give 200 hits/drill.

De-smear using alkaline permanganate or plasma with settings appropriate for polyimide; plasma is preferred for positive etchback

Conventional plating processes are compatible with 35NQ

Standard profiling parameters may be used; chip breaker style router bits are not recommended

Bake for 1 - 2 hours at 250°F (121°C) prior to solder reflow or HASL

# 35NQ

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**North America:**

9433 Hyssop Drive, Rancho Cucamonga, California 91730  
Tel: (909) 987-9533 • Fax: (909) 987-8541

1100 Governor Lea Road, Bear, Delaware, 19701  
Tel: (302) 834-2100, (800) 635-9333  
Fax: (302) 834-2574

**Northern Europe:**

44 Wilby Avenue, Little Lever, Bolton, Lancaster, BL31QE, UK  
Tel/Fax: (44) 120-457-6068

**Southern Europe:**

1 Bis Rue de la Remarde, 91530 Saint Cheron, France  
Tel: (33) 871-096-082 • Fax: (33) 164-566-489

**Arlon Material Technologies**

No. 20 Datong Road, Export Processing Zone, Suzhou New & High District, Jiangsu, China  
Tel (86) 512-6269-6966  
Fax: (86) 512-6269-6038

**Arlon Electronic Materials (Suzhou) Co., Ltd.**

Building 7, Da Xing Industrial Park of Suzhou New & High District  
Jinangsu, China 21500  
Tel: (86) 512-6672-1698  
Fax: (86) 512-6672-1697

**Eastern China:**

Room 11/401, No. 8, Hong Gu Road, Shanghai, China, 200336  
Tel/Fax: (86) 21-6209-0202

**Southern China:**

Room 601, Unit 1, Building 6, Liyuanxincun, Road Holiday,  
Hua qiaocheng, Nanshan District, Shenzhen City, China  
Tel: (86) 755-26906612 • Fax: (86) 755-26921357

