

LN83 10510 25-44

BLOCK V MODULE DESIGN SUMMARY

JET PROPULSION LABORATORY

L.D. Runkle ✓

Objective

- Design to Be Commercially Viable
- Advance in State of the Art Over Block IV
- Improved Reliability and Durability
- Consider System Implications

Contract Requirements

- Preliminary Design of Module
 - Electrical
 - Thermal
 - Mechanical
- Preliminary Inspection System Plan
- Documentation

Schedule

- | | |
|----------------------|-------------------------|
| • RFP Issued | Feb. 27, 1981 |
| • Proposals Received | April 10, 1981 |
| • Contracts Started | Aug. 7 - Sept. 25, 1981 |
| • Completions | Nov. 81 - Feb. 82 |

Module Characteristics

| | Size (cm) | | Mass (kg) | V _{no} (V) | NOCT °C | P(NOC) (W) | P _p (W) | Efficiency (%) | |
|---------|-----------|-------|-----------|---------------------|---------|------------|--------------------|----------------|------|
| | Length | Width | | | | | | NOC | PEAK |
| ARCO | 122 | 61 | 11 | 4.8 | 49 | 50 | 72 | 8.4 | 9.7 |
| GE | 123 | 63 | | 14.3 | 61 | 58 | 90 | 9.2 | 11.5 |
| MTSEC | 168 | 120 | | 17.5 | 47 | 126 | 176 | 7.8 | 8.8 |
| RCA | 122 | 118 | 22.6 | 5.3 | 42 | 86 | 114 | 7.6 | 8.0 |
| Solarex | 138 | 96 | 23.6 | 15.0 | 49 | 77 | 108 | 7.2 | 8.1 |
| Spire | 113 | 61 | 7.3 | 15.0 | 49 | 54 | 78 | 10.1 | 11.3 |

NOC 80 mW/cm², AM1.5, NOCT
 NOCT 80 mW/cm², 20°C Ambient, 1 m/sec Wind
 PEAK 100 mW/cm², AM1.5, 25°C

Cell and Circuit Features

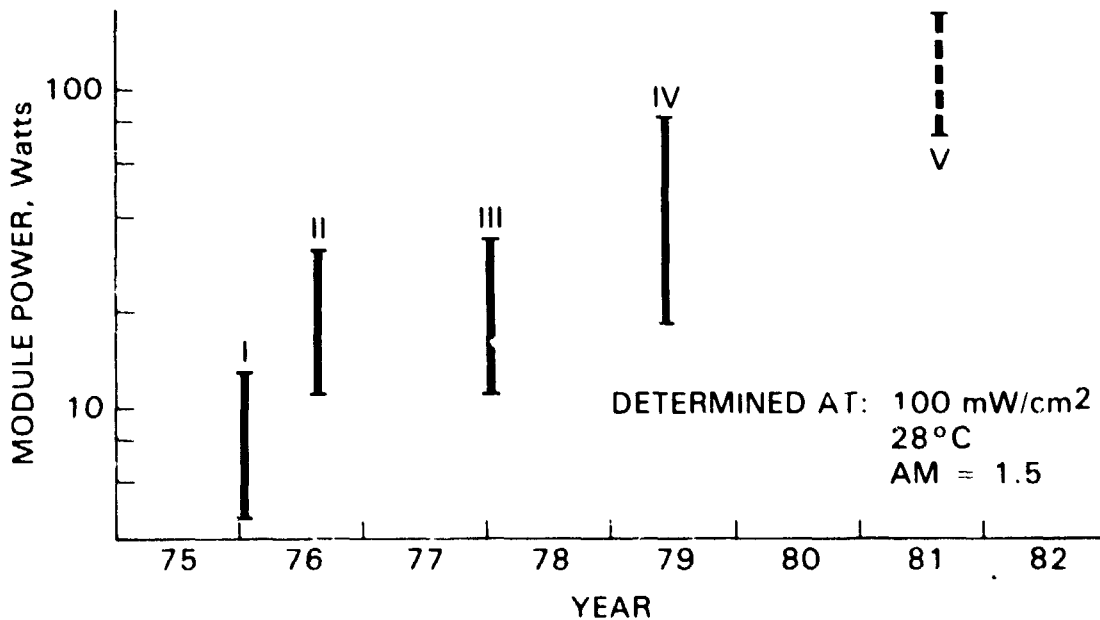
| | Size (cm) | Base Material | Encapsulated Cell Efficiency | | Total Cells | Series Cells | Parallel Cells | Series per Diode | Number of Diodes |
|---------|------------------|---------------|------------------------------|------|-------------|--------------|----------------|------------------|------------------|
| | | | PEAK | NOC | | | | | |
| ARCO | 10.3 (dia) | Cz | 13.4 | 11.6 | 56 | 11 | 6 | - | 0 |
| GE | 10x10 | Cz | 12.9 | 10.4 | 72 | 36 | 2 | 12 | 3 |
| MTSEC | 5x10 | EFG | 9.8 | 8.8 | 352 | 44 | 8 | 11 | 4 |
| RCA | 10 (dia) w/flats | Cz | 10.2 | 9.6 | 144 | 12 | 12 | - | 0 |
| Solarex | 10x15 | Semi Crystal | 9.2 | 8.2 | 78 | 39 | 2 | 13 | 3 |
| Spire | 10 (dia) w/flats | Cz | 14.4 | 12.6 | 72 | 36 | 2 | 12 | 3 |

NOC 80 mW/cm², AM1.5, NOCT
 NOCT 80 mW/cm², 20°C Ambient, 1 m/sec Wind
 Peak 100 mW/cm², AM1.5, 25°C

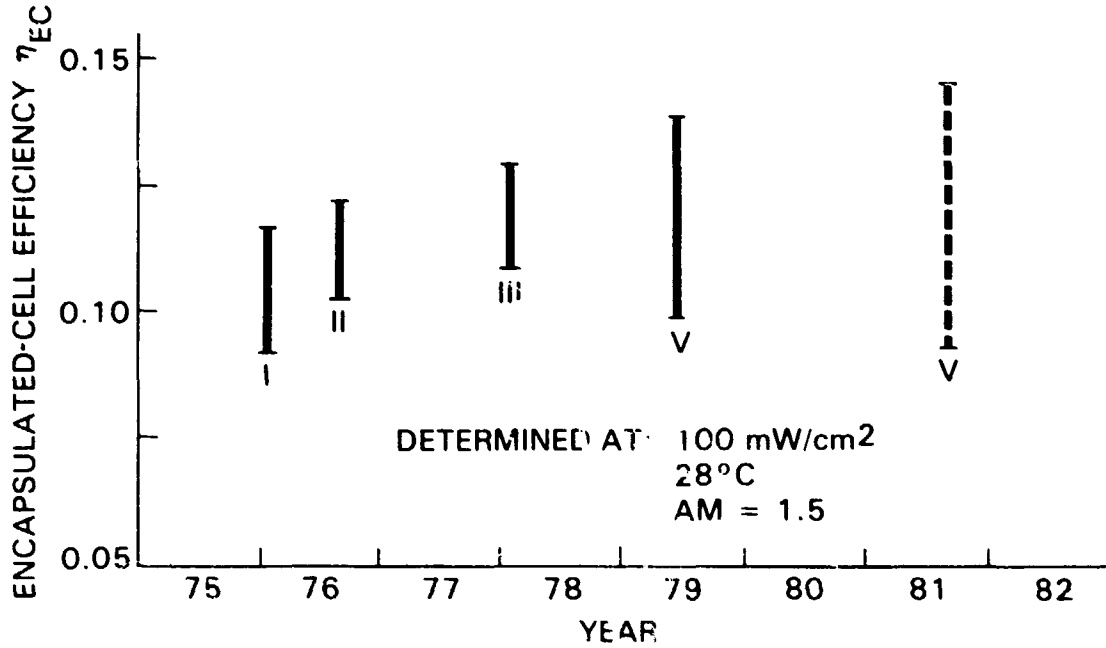
Encapsulation Features

| | Top Cover or Superstrate | Pot- tant | Spacer | Back Cover or Substrate (From inside out) | Frame |
|----------------|---|--------------|-------------|---|---------------------------|
| ARCO | 3.18-mm Tempered Water-white glass | EVA | None | Ted-Poly-Al-Ted | Anodized Al |
| GE | 5-mm Tempered Sunadex Glass | EVA | Scrim | Ted-Poly-Al-Ted | None (Shingle) |
| MTSEC | 5-mm Tempered Water-white Glass | EVA | - | Poly-Al-Ted | None |
| RCA | 3.18-mm Tempered Water-white Glass | EVA | Craneglas | 3.18-mm Tempered Float Glass | EPDM Gasket |
| Solarex | 3.18-mm Tempered Water-white Glass | EVA | Craneglas | Poly-Ted | Gasket |
| Spire | 3.18-mm Tempered Heliolite or Solatex Glass | EVA | Glass Fiber | Tedlar | EPDM Gasket & Glide |

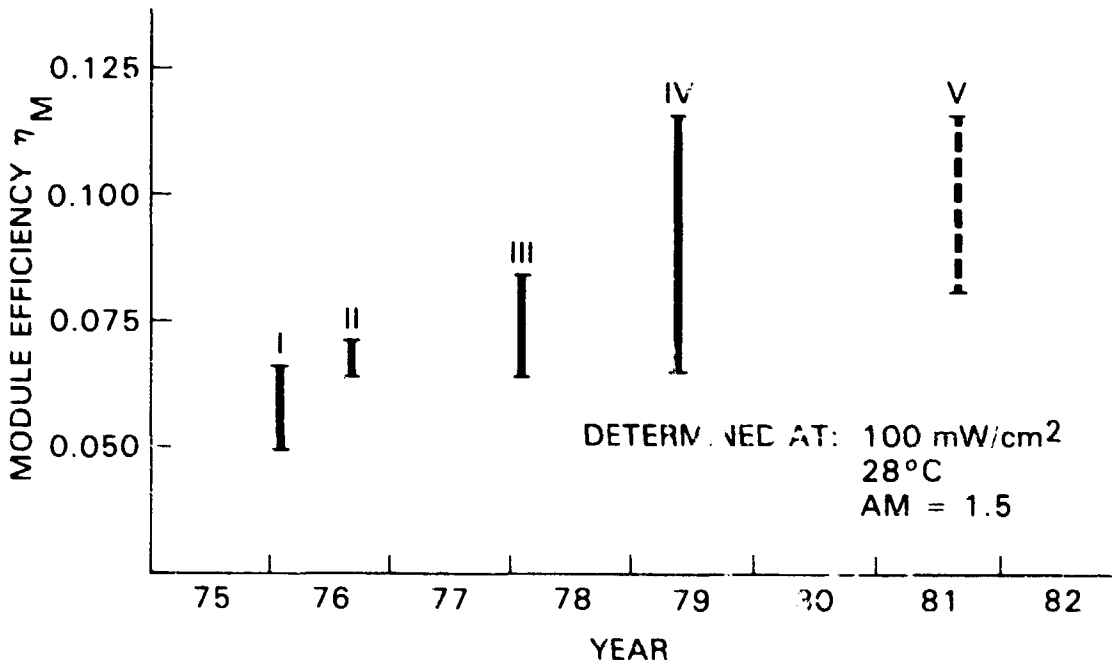
Module Power Trend



Cell Efficiency



Module Efficiency



Packing Factor

