

# ALKL-60W

## GaAs + GaN Technology

THE WORLD'S SMALLEST OUTDOOR 60W Low Ku-Band BUC High Temp +70C



### FEATURES:

- Hyper-Light Package Design Only 3.5lbs (1.6kg)
- Extreme Stability, Reliability and Performance
- Built-in HPA Overdrive Circuit Protection
- Built-in Optimized Linearization
- Built-in Ultra Receive Band Reject Filter
- Built-in Anti Vibration Technology
- Built-in DC Input Noise Suppression Filter
- Extreme GaN Linearity and Efficiency
- Exceeds ALL IESS-308/309 Phase Noise Standards
- Triple protection sealed waveguide output
- Field Replaceable IP68 Rated Fans
- Fully Assembled, and Rigorously Tested in the USA
- 3 Year Warranty



### DESIGN OVERVIEW:

The "LIGHTWEIGHT" series Low (12.75 - 13.25GHz) Frequency 60W Low Ku-Band BUCs are the next generation of the World's Smallest feed-horn & boom-arm mountable BUCs in the industry, weighing-in only at 3.5lbs (1.6kg) and working at high temp up to 70°C.

### PERFORMANCE SPECIFICATIONS

|                                                                                                                               |                                                                        |
|-------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------|
| <b>Operating RF Frequency</b>                                                                                                 | ALKL 12.75 - 13.25 GHz                                                 |
| <b>Operating IF frequency</b>                                                                                                 | 950 - 1700 MHz   950 - 1450 MHz                                        |
| <b>Local Oscillator</b>                                                                                                       | 12.80 GHz   13.05 GHz                                                  |
| <b>Rated Output Power PSAT</b>                                                                                                | 60W 47.8 dBm                                                           |
| <b>Linear Power SR @ -26dBc PLIN</b>                                                                                          | 48W 46.8 dBm                                                           |
| <b>IMD3 (two tones) 3dB Back Off</b>                                                                                          | -25 dBc max.<br>2 signal 5MHz apart at P-LINEAR                        |
| <b>Spectral Regrowth at PLINEAR</b><br>(QPSK at 1.5x and OQPSK at 1.0x symbol rate offset with 2dB back-off from rated power) | -30 dBc                                                                |
| <b>10MHz External Ref. (Internal High Stability Optional)</b>                                                                 | 10MHz Ref. Level: 0dBm +/- 5dBm<br>Internal Ref. Stability +/- 0.1 ppm |

### COMPLIANCE INFORMATION

|                      |                 |                   |
|----------------------|-----------------|-------------------|
| MIL - STD - 188/164C | MIL - STD - 461 | ROHS, REACH, WEEE |
| MIL - STD - 810E     | DO - 160 G      |                   |

### SPURIOUS & PHASE NOISE

|                                                   |                                     |            |
|---------------------------------------------------|-------------------------------------|------------|
| <b>In-Band/Out-band Spurious</b>                  | -60dBc max.                         |            |
| <b>Group Delay</b>                                | Ripple 1 nsec point to point max.   |            |
| <b>AM/PM Conversion</b>                           | 1.0°/dB max. at 3 dB output backoff |            |
| <b>Noise Power Density (TX)</b>                   | -85dBm/Hz                           |            |
| <b>Noise Power Density (RX)</b>                   | -155dBm/Hz(10.7 - 11.7 GHz)         |            |
| <b>Phase Noise<br/>(Up Converter) (Ext. Ref.)</b> | -55 dBc/Hz @ 10 Hz                  | -115dBc/Hz |
|                                                   | -65 dBc/Hz @ 100 Hz                 | -135dBc/Hz |
|                                                   | -75 dBc/Hz @ 1 kHz                  | -150dBc/Hz |
|                                                   | -85 dBc/Hz @ 10 kHz                 | -155dBc/Hz |
|                                                   | -95 dBc/Hz @ 100 kHz                | -160dBc/Hz |

### PROTECTION

|                         |             |         |
|-------------------------|-------------|---------|
| VOLTAGE                 | OVERTEMP    | VSWR    |
| SMART ALARMS IN THE M&C | MICROPHONIC | CURRENT |

### POWER CONSUMPTION

|                           |      |
|---------------------------|------|
| <b>60W 47.8 dBm PSAT</b>  | 260W |
| <b>48W 46.8 dBm P-LIN</b> | 220W |

## ENVIRONMENT SPECIFICATIONS

|                                       |                              |
|---------------------------------------|------------------------------|
| <b>Environmental MIL-STD</b>          | Compliant with MIL-STD810E   |
| <b>Vibration MIL-STD</b>              | MIL-STD810F, Method 514.5    |
| <b>Operating Temperature Range</b>    | - 40° C to + 70°C            |
| <b>Storage Temperature Range</b>      | - 60°C to + 85°C             |
| <b>Fan Rating / Field Replaceable</b> | IP 68, Field Replaceable     |
| <b>Humidity</b>                       | 100% Condensing, IP67 Rated  |
| <b>Shock</b>                          | 20 g peak, 11 msec, 1/2 sine |
| <b>Altitude</b>                       | 21,500ft, 6,500m             |

## M&C INTERFACE

|                                       |                                                      |
|---------------------------------------|------------------------------------------------------|
| <b>Advanced Monitor &amp; Control</b> | Ethernet Web Page Based, SNMP, RS232/485, FSK (opt.) |
| <b>ALARMS</b>                         | PLL LOCK, HPA, VSWR, MUTE, TX                        |
| <b>Stealth PLin Operation Mode</b>    | LED Shut-Off   Silenced fans                         |

## MECHANICAL SPECIFICATIONS

|                                |                                                          |
|--------------------------------|----------------------------------------------------------|
| <b>Dimensions (DC Powered)</b> | 6.55" x 3.94" x .3" (166×100×76.2 mm) Without Connectors |
| <b>Weight (DC Powered)</b>     | 3.5lbs (1.6kg )                                          |

## PART NUMBERING SYSTEM

AL- "LIGHT BRICK" MODEL SERIES  
 KU - Universal Ku-Band 13.75 - 14.50 GHz  
 KS - Standard Ku-Band 14.0 - 14.50 GHz  
 KD - Dual Ku-Band 13.75 - 14.50 GHz | 14.0 - 14.50 GHz  
 40 | 50 | 60 Rated Power in Watts  
 N | F - 50 Ohm or 75 Ohm IF Input Connector Type  
 M - Full M&C Option RS232/485, SNMP, Ethernet  
 A - AC Power 85-260VAC (increases size and weight)  
 R - 10 MHz Ref. Auto Sense | Internal Reference  
 K - FSK Option  
 U - Universal Mounting Bracket  
 J - Weatherproof DC/RJ45 Cable Dongle  
 C xxxx - Custom RAL Color Code  
 L - Custom Language  
 P - Custom Part number  
 B - Custom Label  
 G - Custom Logo  
 T- Redundancy Ready  
 H - High Gain (+79dB - 82dB)  
 W - Weatherproof Pelican Style Case  
 O - Other Custom Option  
 X- Custom Cable



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## INPUT|OUTPUT INTERFACE

|                                                                                                           |                                                                        |
|-----------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------|
| <b>IF Connector</b>                                                                                       | N-type (50 Ohm)   F-type (75 Ohm)                                      |
| <b>Universal Prime Power via IF or MS/M&amp;C Connector (7.0 A Current Limit Protection Through Coax)</b> | +22 -55 VDC                                                            |
| <b>Output VSWR</b>                                                                                        | 1.3:1                                                                  |
| <b>Output Interface</b>                                                                                   | WR75 Grooved                                                           |
| <b>Input VSWR</b>                                                                                         | 1.5:1                                                                  |
| <b>10MHz External Ref. (Internal High Stability +/- 0.1ppm Option Available)</b>                          | 10MHz Ref. Level: 0dBm +/- 5dBm<br>Internal Ref. Stability +/- 0.1 ppm |

## GAIN

|                                       |                                        |
|---------------------------------------|----------------------------------------|
| <b>Gain (Temperature Compensated)</b> | 66dB(min) 72 dB(typ.)                  |
| <b>TX Gain Flatness</b>               | ± 0.75 dB max. over 40 MHz             |
| <b>TX Gain variation 50MHz</b>        | ± 0.5 dB                               |
| <b>TX Gain variation 500MHz</b>       | ± 1.5 dB                               |
| <b>Gain Attenuation</b>               | 31.5dB in 0.5dB Steps, 0.1dB available |

