KCB822

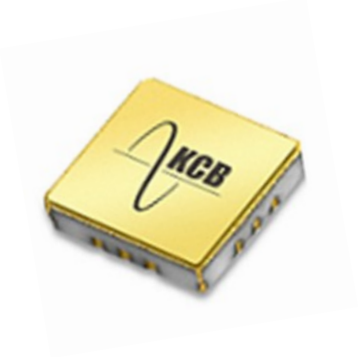
High Isolation SPDT
0.02 – 6 GHz

Preliminary

KCB SOLUTIONS
THE HIGHEST STANDARD IN RF

DESCRIPTION

KCB822 is a GaAs pHEMT Non-Reflective high performance, low loss switch in a 3x3 mm leadless Hermetic Surface-Mount Technology (SMT) package for Harsh Environments including Defense and Satellite application. This device can be ordered with the 100% screening requirements of MIL-PRF-38535 Class B and S, in addition to the required QCI.



FEATURES

- ✓ **Low Loss: .8 dB @ 2 GHz Isolation: 55 dB @ 2 GHz.**
- ✓ **Non Reflective Match in off state (S22).**
- ✓ **NASA EEE-INST-002 compliant.**
- ✓ **Successfully Tested to 1M RAD TID.**
- ✓ **High Reliability Class B and S Screening Available.**
- ✓ **See Page 4 for MFR HI –REL Ordering Details.**

ELECTRICAL CHARACTERISTICS (+25°C)

Parameter	Conditions	Min	Typical	Max	Units
Insertion Loss	0.02 – 2.0 GHz 2.0 – 3.0 GHz 3.0 – 4.0 GHz 4.0 – 6.0 GHz		0.75 0.8 1.0 1.5	1.10 1.25 1.35 1.8	dB dB dB dB
RF1/RF2 Return Loss (ON-State)	0.02 – 2.0 GHz 2.0 – 3.0 GHz 3.0 – 4.0 GHz 4.0 – 6.0 GHz	19 15 12 9	22 22 18 12		dB dB dB dB
RF1/RF2 Return Loss (OFF-State)	0.02 – 0.1 GHz 0.1 – 0.5 GHz 0.5 – 2.0 GHz 2.0 – 3.0 GHz 3.0 – 4.0 GHz 4.0 – 6.0 GHz	0 5 9 12 12 9	0 8 11 15 15 13		dB dB dB dB dB dB
Isolation	0.02 – 2.0 GHz 2.0 – 3.0 GHz 3.0 – 4.0 GHz 4.0 – 6.0 GHz	50 50 45 40	55 55 50 45		dB dB dB dB
Input 1 dB Compression (P1dB)	Vctl = 0V/+5V, 0.5- 2.0 GHz .02 -.50 Ghz		 +30 +24		 dBm dBm
Third Order Output Intercept Point (IP3)	+8 dBm Input Tones ,1 MHz Spacing, Vctl = 0V/5V, 0.5- 2.0 GHz .02 - 0.5 Ghz		 +46 +30		 dBm dBm
Switching Speed: Rise, Fall ON/OFF	 10/90% or 90/10% RF 50% CTL to 90/10% RF		 5 15		 nS nS
Negative (Positive) Control Vctrl High Vctrl Low I ctrl	 DC Voltage DC Voltage DC Current	 -7.0 (+2.7) -0.25	 -5.0 (+5.0) 0 50	 -4.5 (+7.0) +0.25 200	 V V uA

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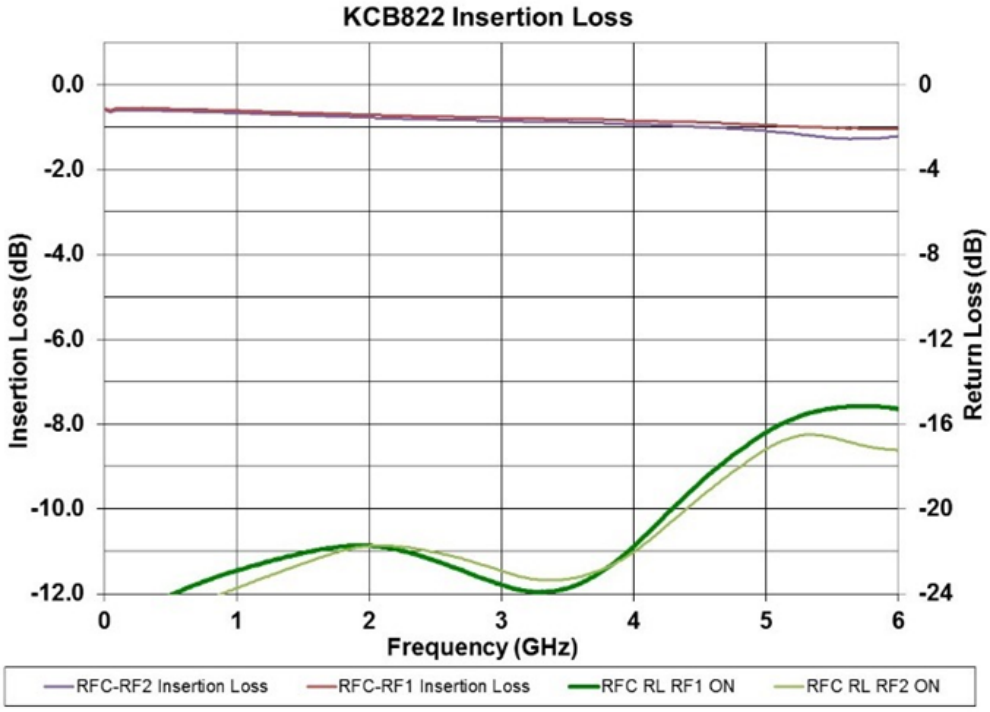
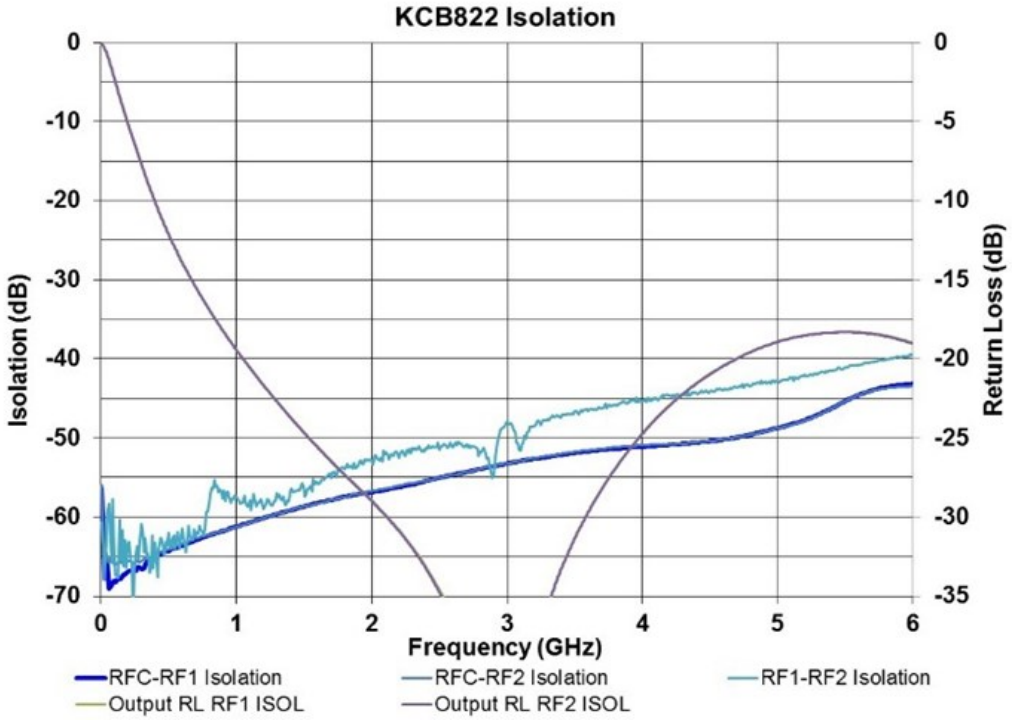
TYPICAL PERFORMANCE (+25°C)





Note: Typical Insertion loss change .003db /degree C. .

TRUTH TABLE/NEGATIVE CONTROL

Control Input		Signal Path State	
B	A	RFC to RF1	RFC to RF2
-5.0	0	ON	OFF
0	-5	OFF	ON

TRUTH TABLE/POSITIVE CONTROL

Control Input		Signal Path State	
B	A	RFC to RF1	RFC to RF2
0	+5.0	ON	OFF
+5.0	0	OFF	ON

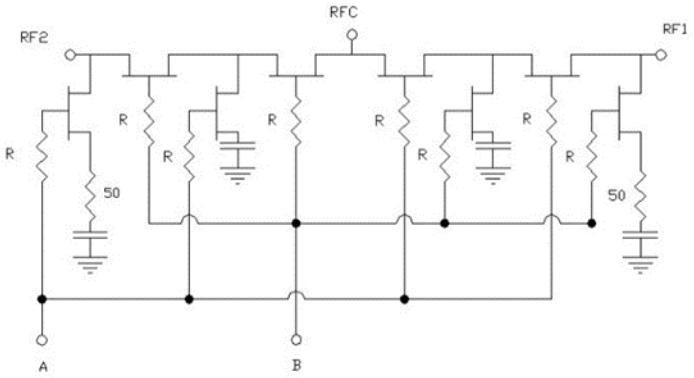
Note: External blocking capacitors are required on all RF ports. Capacitor should be selected to allow for low frequency operation.

ABSOLUTE MAXIMUM RATINGS

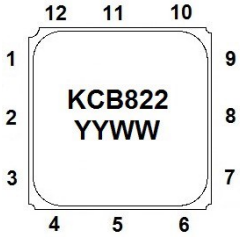
Exceeding Max limits may cause damage

Characteristic	Min.	Max.	Units
Control Voltage (A+B)	-0.2	+9.0	Volts
RF Input Power		+30	dBm
Storage Temperature	-65	+150	°C
Operating Case Temp	-55	+125	°C
Junction Temperature		+175	°C

SCHEMATIC



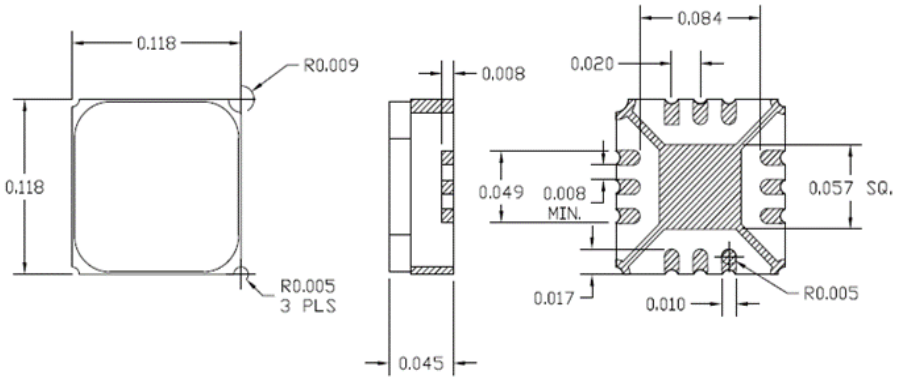
PINOUT



XXX = Serial # will be added for Class B and S Part #

1	GND
2	RF1
3	GND
4	GND
5	GND
6	GND
7	GND
8	RF2
9	B
10	A
11	RFC
12	GND

OUTLINE DRAWING



Electrostatic Sensitive Device. Proper ESD precaution should be used when handling device.

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MFR HI-REL SCREENING FLOW

Test Inspection	MIL – STD -883		Requirement	
	Method	Condition	Class B	Class S
Wafer Lot Acceptance /1	5007		N/A	Per Wafer Lot
Non-Destructive Bond Pull	2023		SPC	SPC
Internal Visual	2010	A= Class S, B = Class B	100%	100%
Temperature Cycle	1010	C	100%	100%
Acceleration	2001	E (Y1 only)	100%	100%
PIND	2020	A (5 Cycles)	N/A	100%
Serialization	Per Product Specification		100%	100%
Radiographic	2012	2 views	N/A	100%
Electrical Test	Small Signal Testing	+25^{O}C	100%	100%
Burn In	1015	A	100%/160 Hours/125^{O}C	100%/320 Hours/125 ^{O}C
Final Electrical	Small Signal Testing	+25^{O}C	100%	100%
PDA Calculation	5004	25% Δ IL / 100% Δ Icc	5%	5%/3% functional
Group A Electrical /5	Per Product Specification	-55^{O}C + 125^{O}C	45/0	45/0
Leak Test	1014 A and C	1 x 10 -8 Max	100%	100%
External Visual	2009		100%	100%

NOTES

1. Product under configuration control per KCB QAP 015.
2. Customer will be notified of all class 1 changes for Class B and S part numbers.
3. Wafer Lot Acceptance will include 100% die visual, SEM analysis and Lot Traceability.
4. Electrical Test Data will be recorded for each Serial number and included in Final Test Report for all Class S part number.
5. Group A Electrical testing will include the Small Signal and Ic at the Min/Max operating condition. The Dynamic test (P1dB, IP3, SS) will be tested at +25c only.

ORDERING INFORMATION

	Unscreened	Class B	Class S
KCB Solutions Part Number	KCB822C	KCB822B	KCB822S