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Approval	Name	Signature
Engineering:	Steve Leroux	
Manufacturing:	Joe Allen	
Quality Assurance:	Tony Morello	
Customer: (If Required)		

	Revision Record Cover Sheet								
Revision	Date	Change Description							
Х	4/1/09	Preliminary for customer approval – Unreleased, uncontrolled document.							

## **1 PURPOSE**

1.1 The purpose of this specification is to define the Electrical and Mechanical parameters for products in accordance with customer sales order. When customer purchase order specifies external specifications such as Specification Control Drawing (SCD) and or Statement of Work (SOW) those documents takes precedence and internal product specification will not be issued.

## 2 RESPONSIBILITY AND APPLICABILITY

- 2.1 This Product specification is applicable to all activities relating to company's Quality System.
- 2.2 It is the responsibility of the Quality Assurance Manager to ensure that this specification is accurate, understood, and effectively implemented.
- 2.3 Changes made to this specification shall be processed in accordance with the document control procedures.

## **3** APPLICABLE DOCUMENTS

- 3.1 The following documents of issue in effect on the date thereof, ranked in order of governing priority in the event of conflict there between, form a part of this document to the extent herein specified.
  - 3.1.1 Customers Purchase Order
  - 3.1.2 Statement of Work
  - 3.1.3 Specification Control Drawing
  - 3.1.4 Hill Engineering Sales Order
  - 3.1.5 Hill Engineering Product Specification
  - 3.1.6 Hill Engineering Product Assembly Configuration

## 3.2 CONDITIONS

**3.3** This document describes the specification for a high power 1P3T switch with internal switch driver. This is a cold switched design i.e.; switched while RF is off. Proper bias levels per section 11 must be applied before operating this switch

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ITEM	CHARACTERISTIC	CONDITIONS	MIN	MAX	UNITS	COMMENTS
NO 1	POWER SPECIFICATION	IN BAND				
1.1	FREQUENCY		500	1900	MHz	
1.2	PEAK POWER			2000	WATTS	
1.3	PULSE WIDTH			10	μS	
1.4	DUTY			6	%	
1.5	AVG. POWER			120	WATTS	
2	POWER SPECIFICATIONS	GUARD BAND				
2.1	FREQUENCY		2200	2600	MHz	
2.2	PEAK POWER			20	WATTS	
2.3	PULSE WIDTH			10	μS	
2.4	DUTY			6	%	
2.5	CW POWER			1.2	WATTS	
3	POWER SPECIFICATIONS	OUT OF BAND				
3.1	FREQUENCY		>2600		MHz	
3.2	PEAK POWER			10	dBm	
3.3	PULSE WIDTH		CW		μS	
3.4	DUTY		CW		%	
3.5	CW POWER			10	dBm	
4	OPERATING FREQUENCY		500	1900	MHz	
5	INSERTION LOSS					
5.1				1	dB	
6	ISOLATION					
6.1	INPUT TO OUTPUT			30	dB	
6.2	OUTPUT TO OUTPUT			30	dB	
7	PHASE					
7.1	MATCHING					NOT SPECIFIED
7.2	TRACKING					NOT SPECIFIED
8						
8.1	PORTS NOT SELECTED					REFLECTIVE

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ITEM         CHARACTERISTIC         CONDITIONS         MIN         MAX         UNITS         COMMENTS           8         VSWR (CONT.)         1							
8         VSWR (CONT.)         1.4:1           8.2         INPUT & OUTPUT, SELECTED PORTS         1.4:1		CHARACTERISTIC	CONDITIONS	MIN	MAX	UNITS	COMMENTS
SELECTED PORTS		VSWR (CONT.)					
8.3         TERMINATION         2.0.1	8.2	INPUT & OUTPUT, SELECTED PORTS		1.4:1			
9         HARMONICS & SPURS         NOT SPECIFIED           9.1         INTERNALLY GENERATED         NOT SPECIFIED           9.2         MEASURED AT INCIDENT POWER         0         WATTS           10         SWITCHING         0         WATTS           10.1         SPEED         50% Logic To 0.5dB         4         us           10.2         SWITCHING RATE         10         KHz           10.3         COMMAND LOGIC         TTL          SEE DWG 4042           10.4         VIDEO LEAKAGE         NOT SPECIFIED         NOT SPECIFIED           10.5         LOGIC TABLE         NOT SPECIFIED         SEE DWG 4042           11.1         POSITIVE BIAS VOLTAGE         4.8         5.2         VDC           11.1         POSITIVE BIAS VOLTAGE         -95         -100         VDC           11.2         POSITIVE BIAS CURRENT         400         mA           11.3         NEGATIVE BIAS CURRENT         60         mA           12         INSTALLATION         SEE DWG 4042         -           13.1         RF         Multi pin D type         -           13.1         RF         Multi pin D type         -           14.1         WEIGHT         <	8.3	TERMINATION		2.0:1			
9.1       INTERNALLY GENERATED       NOT SPECIFIED         9.2       MEASURED AT INCIDENT POWER       0       WATTS         10       SWITCHING       0       WATTS         10.1       SPEED       50% Logic To 0.5dB       4       uS         10.2       SWITCHING RATE       10       kHz         10.3       COMMAND LOGIC       TTL       10       kHz         10.4       VIDEO LEAKAGE       NOT SPECIFIED       NOT SPECIFIED         10.5       LOGIC TABLE       NOT SPECIFIED       NOT SPECIFIED         10.5       LOGIC TABLE       NOT SPECIFIED       NOT SPECIFIED         11.1       POSITIVE BIAS VOLTAGE       4.8       5.2       VDC         11.2       NEGATIVE BIAS VOLTAGE       -95       -100       VDC         11.2       POSITIVE BIAS CURRENT       400       mA         11.3       NEGATIVE BIAS CURRENT       60       mA         12       INSTALLATION        SEE DWG 4042         13       CONNECTORS         MIT         13.1       RF         Multi pin D type         14       MECHANICAL            14.1	8.4	SOURCE		1.2:1			
9.1       INTERNALLY GENERATED       NOT SPECIFIED         9.2       MEASURED AT INCIDENT POWER       0       WATTS         10       SWITCHING       0       WATTS         10.1       SPEED       50% Logic To 0.5dB       4       uS         10.2       SWITCHING RATE       10       kHz         10.3       COMMAND LOGIC       TTL       10       kHz         10.4       VIDEO LEAKAGE       NOT SPECIFIED       NOT SPECIFIED         10.5       LOGIC TABLE       NOT SPECIFIED       NOT SPECIFIED         10.5       LOGIC TABLE       NOT SPECIFIED       NOT SPECIFIED         11.1       POSITIVE BIAS VOLTAGE       4.8       5.2       VDC         11.2       NEGATIVE BIAS VOLTAGE       -95       -100       VDC         11.2       POSITIVE BIAS CURRENT       400       mA         11.3       NEGATIVE BIAS CURRENT       60       mA         12       INSTALLATION        SEE DWG 4042         13       CONNECTORS         MIT         13.1       RF         Multi pin D type         14       MECHANICAL            14.1							
9.2         MEASURED AT INCIDENT POWER         0         WATTS           10         SWITCHING         0         WATTS           10.1         SPEED         50% Logic To 0.5dB         4         uS           10.2         SWITCHING RATE         10         kHz           10.3         COMMAND LOGIC         TTL         10         kHz           10.4         VIDEO LEAKAGE         0         NOT SPECIFIED           10.5         LOGIC TABLE         0         SEE DWG 4042           11.4         POSITIVE BIAS VOLTAGE         4.8         5.2         VDC           11.1         POSITIVE BIAS VOLTAGE         -95         100         VDC           11.2         POSITIVE BIAS CURRENT         400         mA           11.3         NEGATIVE BIAS CURRENT         60         mA           12         INSTALLATION         1         SEE DWG 4042           13         CONNECTORS         1         1           13.1         RF         1         Multi pin D type           14         MECHANICAL         1         1           14.1         WEIGHT         2         1b           14.2         OUTLINE         1         SEE DWG 4042	9	HARMONICS & SPURS					
POWER         Image: Constraint of the second s	9.1	INTERNALLY GENERATED					NOT SPECIFIED
10.1         SPEED         50% Logic To 0.5dB         4         uS           10.2         SWITCHING RATE         10         kHz           10.3         COMMAND LOGIC         TTL         10         kHz           10.4         VIDEO LEAKAGE         NOT SPECIFIED         NOT SPECIFIED           10.5         LOGIC TABLE         NOT SPECIFIED         SEE DWG 4042           11         D.C. POWER         VDC         SEE DWG 4042           11.1         POSITIVE BIAS VOLTAGE         4.8         5.2         VDC           11.2         NEGATIVE BIAS VOLTAGE         -95         -100         VDC           11.2         POSITIVE BIAS CURRENT         400         mA	9.2				0	WATTS	
10.1         SPEED         50% Logic To 0.5dB         4         uS           10.2         SWITCHING RATE         10         kHz           10.3         COMMAND LOGIC         TTL         10         kHz           10.4         VIDEO LEAKAGE         NOT SPECIFIED         NOT SPECIFIED           10.5         LOGIC TABLE         NOT SPECIFIED         SEE DWG 4042           11         D.C. POWER         VDC         SEE DWG 4042           11.1         POSITIVE BIAS VOLTAGE         4.8         5.2         VDC           11.2         NEGATIVE BIAS VOLTAGE         -95         -100         VDC           11.2         POSITIVE BIAS CURRENT         400         mA	- 10	014/7701/1110					
10.2SWITCHING RATE10kHz10.3COMMAND LOGICTTLISEE DWG 404210.4VIDEO LEAKAGEINOT SPECIFIED10.5LOGIC TABLEISEE DWG 404211D.C. POWERISEE DWG 404211.1POSITIVE BIAS VOLTAGE4.85.2VDC11.2NEGATIVE BIAS VOLTAGE-95-100VDC11.2POSITIVE BIAS CURRENT400mA11.3NEGATIVE BIAS CURRENT60mA12INSTALLATIONISEE DWG 404213CONNECTORSII13.1RFIMulti pin D type14MECHANICALISEE DWG 404214.1WEIGHT2Ib14.2OUTLINEISEE DWG 404215ENVIRONMENTALISEE DWG 404215.1OPERATING-20+7115.2STORAGE TEMPERATURE-40+85°CIIIS	_						
10.3         COMMAND LOGIC         TTL         SEE DWG 4042           10.4         VIDEO LEAKAGE         NOT SPECIFIED           10.5         LOGIC TABLE         SEE DWG 4042           11         D.C. POWER         SEE DWG 4042           11.1         POSITIVE BIAS VOLTAGE         4.8         5.2         VDC           11.2         NEGATIVE BIAS VOLTAGE         -95         -100         VDC           11.2         POSITIVE BIAS CURRENT         400         mA           11.3         NEGATIVE BIAS CURRENT         60         mA           12         INSTALLATION         SEE DWG 4042           13         CONNECTORS         Multipin D type           14         MECHANICAL         Multipin D type           14.1         WEIGHT         2         Ib           14.1         WEIGHT         2         Ib           14.1         WEIGHT         2         Ib           14.2         OUTLINE         SEE DWG 4042           15.1         OPERATING TEMPERATURE         -20         +71         °C           15.2         STORAGE TEMPERATURE         -40         +85         °C			50% Logic To 0.5dB				
10.4VIDEO LEAKAGENOT SPECIFIED10.5LOGIC TABLESEE DWG 404211D.C. POWERSEE DWG 404211.1POSITIVE BIAS VOLTAGE4.85.2VDC11.2NEGATIVE BIAS VOLTAGE-95-100VDC11.2POSITIVE BIAS CURRENT400mA11.3NEGATIVE BIAS CURRENT60mA12INSTALLATIONSEE DWG 404213CONNECTORSSEE DWG 404213.1RFMulti pin D type14MECHANICALMulti pin D type14.1WEIGHT2Ib14.2OUTLINESEE DWG 404215.1OPERATING TEMPERATURE-20+7115.2STORAGE TEMPERATURE-40+85					10	kHz	
10.5         LOGIC TABLE         SEE DWG 4042           11         D.C. POWER         4.8         5.2         VDC           11.1         POSITIVE BIAS VOLTAGE         -95         -100         VDC           11.2         NEGATIVE BIAS VOLTAGE         -95         -100         VDC           11.2         POSITIVE BIAS CURRENT         400         mA           11.3         NEGATIVE BIAS CURRENT         60         mA           12         INSTALLATION         5EE DWG 4042           13         CONNECTORS         60         mA           13.1         RF         60         MF           13.3         DC         7         Multi pin D type           14         MECHANICAL         7         10           14.1         WEIGHT         2         1b           14.2         OUTLINE         7         10           15         ENVIRONMENTAL         7         10           15.1         OPERATING TEMPERATURE         -40         +85         °C			TTL				
11         D.C. POWER         4.8         5.2         VDC           11.1         POSITIVE BIAS VOLTAGE         -95         -100         VDC           11.2         NEGATIVE BIAS VOLTAGE         -95         -100         VDC           11.2         POSITIVE BIAS CURRENT         400         mA           11.3         NEGATIVE BIAS CURRENT         60         mA           12         INSTALLATION         60         mA           13         CONNECTORS         9         9           13.1         RF         9         9           14.1         WEIGHT         2         10           14.1         WEIGHT         2         10           14.1         WEIGHT         2         10           14.2         OUTLINE         9         9           14.1         WEIGHT         2         10           14.2         OUTLINE         9         9           15         ENVIRONMENTAL         9         9           15.1         OPERATING TEMPERATURE         -20         +71         °C           15.2         STORAGE TEMPERATURE         -40         +85         °C							
11.1POSITIVE BIAS VOLTAGE4.85.2VDC11.2NEGATIVE BIAS VOLTAGE-95-100VDC11.2POSITIVE BIAS CURRENT400mA11.3NEGATIVE BIAS CURRENT60mA12INSTALLATION60mA13CONNECTORS9913.1RF9913.3DC9914MECHANICAL914.1WEIGHT21b14.2OUTLINE9915ENVIRONMENTAL9915ENVIRONMENTAL9915.1OPERATING TEMPERATURE-20+7115.2STORAGE TEMPERATURE-40+85							SEE DWG 4042
11.2NEGATIVE BIAS VOLTAGE-95-100VDC11.2POSITIVE BIAS CURRENT400mA11.3NEGATIVE BIAS CURRENT60mA12INSTALLATION60mA13CONNECTORS1113.1RF1NF13.3DC1Multi pin D type14MECHANICAL2Ib14.1WEIGHT2Ib14.2OUTLINE1SEE DWG 404215ENVIRONMENTAL1115.1OPERATING TEMPERATURE-20+7115.2STORAGE TEMPERATURE-40+85							
11.2POSITIVE BIAS CURRENT400mA11.3NEGATIVE BIAS CURRENT60mA12INSTALLATION60mA12INSTALLATION9913CONNECTORS9913.1RF9913.3DC9914MECHANICAL9914.1WEIGHT21b14.2OUTLINE9915ENVIRONMENTAL9915.1OPERATING TEMPERATURE-20+7115.2STORAGE TEMPERATURE-40+85°C99							
11.3NEGATIVE BIAS CURRENT60mA12INSTALLATION60mA12INSTALLATION60mA13CONNECTORS101013.1RF101013.3DC10Multi pin D type14MECHANICAL101014.1WEIGHT21b14.2OUTLINE101015ENVIRONMENTAL101015.1OPERATING TEMPERATURE-20+7115.2STORAGE TEMPERATURE-40+85°C°C				-95	-100	VDC	
12INSTALLATIONSEE DWG 404213CONNECTORSImage: constraint of the second se	11.2				400	mA	
Image: constraint of the second sec					60	mA	
13.1RFNF13.3DCMultipin D type14MECHANICALMultipin D type14.1WEIGHT214.2OUTLINESEE DWG 404215ENVIRONMENTALSEE DWG 404215.1OPERATING TEMPERATURE-2015.2STORAGE TEMPERATURE-4015.2STORAGE TEMPERATURE	12	INSTALLATION					SEE DWG 4042
13.1RFNF13.3DCMulti pin D type14MECHANICALMulti pin D type14.1WEIGHT214.2OUTLINESEE DWG 404215ENVIRONMENTALSEE DWG 404215.1OPERATING TEMPERATURE-2015.2STORAGE TEMPERATURE-4015.3STORAGE TEMPERATURE	13	CONNECTORS					
14MECHANICAL11114.1WEIGHT2lb14.2OUTLINE2lb14.2OUTLINE3SEE DWG 404215ENVIRONMENTAL4415.1OPERATING TEMPERATURE-20+71°C15.2STORAGE TEMPERATURE-40+85°C	13.1	RF					NF
14MECHANICALImage: Constraint of the second s	13.3	DC					Multi pin D type
14.2OUTLINESEE DWG 404214.2OUTLINESEE DWG 404215ENVIRONMENTALSEE DWG 404215OPERATING TEMPERATURE-2015.2STORAGE TEMPERATURE-4015.2STORAGE TEMPERATURE-40	14	MECHANICAL					
Image: constraint of the second sec	14.1	WEIGHT			2	lb	
15.1OPERATING TEMPERATURE-20+71°C15.2STORAGE TEMPERATURE-40+85°C	14.2	OUTLINE					SEE DWG 4042
TEMPERATURE15.2STORAGE TEMPERATURE-40+85	15	ENVIRONMENTAL					
15.2STORAGE TEMPERATURE-40+85°C	15.1			-20	+71	°C	
	15.2			-40	+85	°C	
15.3 VIBRATION LEVEL	15.3	VIBRATION LEVEL					