TELEDYNE
MICROWAVE SOLUTIONS
Everywhereyoulook™

Rev. 7/10

DTS6014 0.1 TO 6.0 GHz THRESHOLD DETECTOR

Typical Values @ +25 °C	DTS6014
Wide Frequency Range	**0.05 to 8.0 GHz**
Wide Power Range	**-12.0 to +12.0 dBm**
Fast Response Time	**800 ηsec**
TTL Output Compatibility	
External Adjustable Threshold Level, Low Drift	
Standard SMTO-8 Package	

SPECIFICATIONS*

Parameter	Typical	Guaranteed 0 to 50 °C	Guaranteed -55 to +85 °C
Frequency (Min.)	**0.05-8.0 GHz**	**0.1-6.0 GHz**	**0.1-6.0 GHz**
Input Power Range (Min.)	-12 to +12 dBm	-10 to +10 dBm	-10 to +10 dBm
VSWR (Max.)	1.5:1	2.0:1	2.0:1
Power Flatness (Max.)	±0.5 dB	±0.75 dB	±0.75 dB
Threshold Temperature Stability			
(Max.) @ -10 dBm Input Power	±0.75 dB	±1.0 dB	±1.0 dB
@ 0 dBm Input Power	±0.5 dB	±0.75 dB	±1.0 dB
@ +10 dBm Input Power	±0.3 dB	±0.6 dB	±0.75 dB
Pulse Response (Max.)			
Rise Time (10% DC to 90% DC)	360 ηsec^	700 ηsec^	1000 ηsec^
Fall Time (90% DC to 10% DC)	65 ηsec^	150 ηsec^	200 ηsec^
Total Response Time (50% RF to 10% or 90% DC)	800 ηsec^	1500 ηsec^	2000 ηsec^
Supply Current (Max.) (no RF)	2 mA	4 mA	5 mA
Supply Current (Max.) Pin = +5.0 dBm	2 mA	4 mA	5 mA
Threshold Hysteresis			
@ -10 to -1 dBm Input Power	±1.0 dB†	±1.5 dB†	±2.0 dB†
@ 0 to +10 dBm Input Power	±0.3 dB†	±1.0 dB†	±1.5 dB†
Control Terminate Current (Max.)	0.3 mA	1.0 mA	1.0 mA
Output Compatibility	TTL	TTL	TTL

*Measured in a 50 Ohm system at +5.0 Vdc. R_{TH}=120 to 2800 Ohm unless otherwise specified. 1 MOhm || 8pF output load. ^ Input change ≥3 dBm above P threshold and applied for entire dynamic range. † Apply for both resistance and voltage control.

MAXIMUM RATINGS

DC Voltage	+20 V
Continuous RF Input Power	+20.0 dBm
Operating Case Temperature	-55 °C to +125 °C
Storage Temperature	-65 °C to +150 °C
Burn-In Temperature	+150 °C
Detector Thermal Resistance[1] (θjc)	+800 °C/Watt
Temperature Rise @ 10 dBm (Tjc)	+8 °C

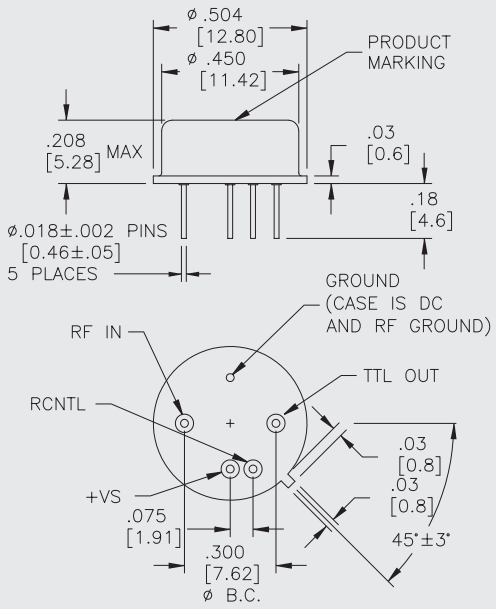
[1] Thermal resistance is based on RF input power. Ratings based on +25 °C.

APPLICATION NOTES

- DTS6014 is a sensitive microwave threshold detector which provides efficient and accurate RF level measurement.
- DTS6014 is configured using two Schottky diode detectors, high precision comparator, and a compensated voltage reference to provide excellent temperature stability.
- DTS6014 is specifically designed for system built-in test and channel RF activity monitoring.
- The output of this unit is derived from a comparator, a true TTL logic device.
- Average power detection is obtained at power levels below approximately 0 dBm.
- DTS6014 contains open-collector comparator with internal 5.1 KOhm pull-up resistor. Pulse response (Low-to-Hi state) can be sped up by using external pull-up resistor. Max sink current is 6.0 mA.
- Connect external threshold resistor from Rcntl port to ground.

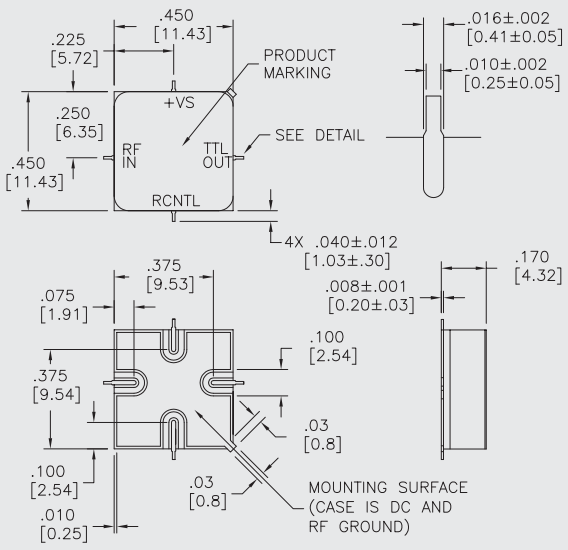
DTC6014

TO-8 Package for Detectors



DTS6014

SMTO-8 for Detectors

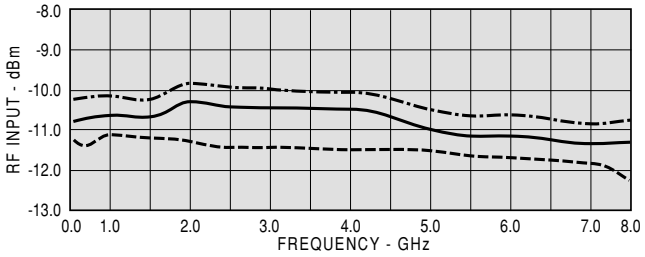


DIMENSIONS ARE IN INCHES [MILLIMETERS]

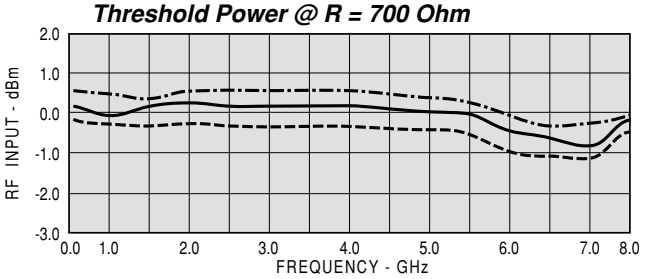
TYPICAL PERFORMANCE

KEY: +25 °C —
+85 °C -·-
-55 °C - - -

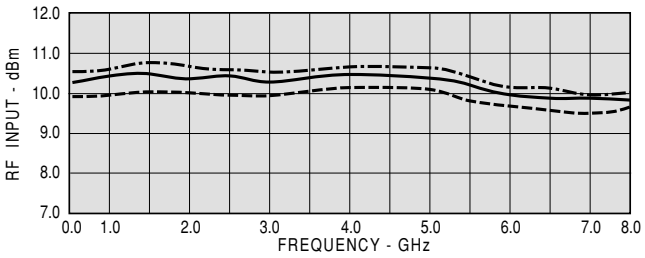
Threshold Power @ R = 120 Ohm



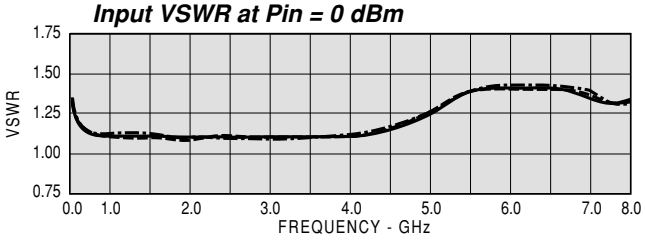
Threshold Power @ R = 700 Ohm



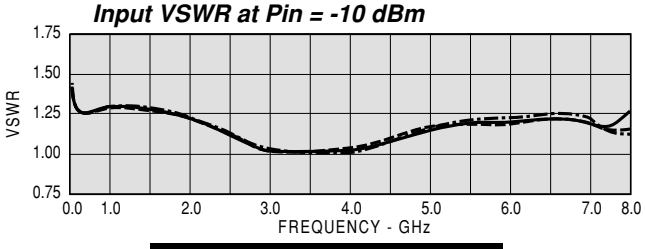
Threshold Power @ R = 2800 Ohm



Input VSWR at Pin = 0 dBm



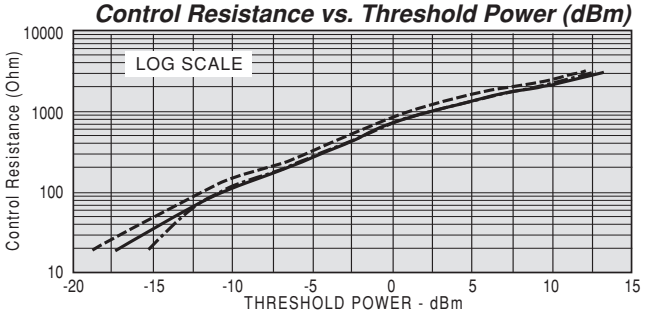
Input VSWR at Pin = -10 dBm



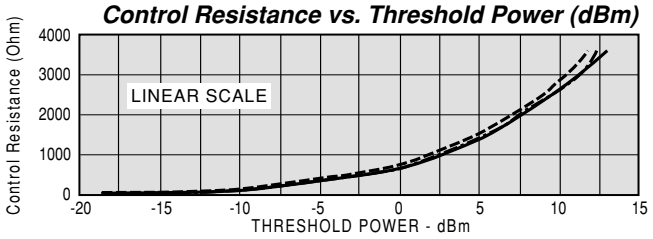


Pulse Response @ R_{TH} = 120 Ohms (with 1KOhm Pull-up Resistor)

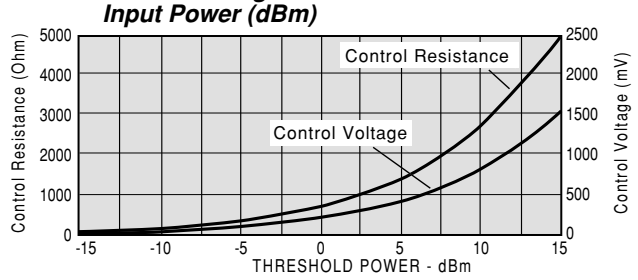
Control Resistance vs. Threshold Power (dBm)

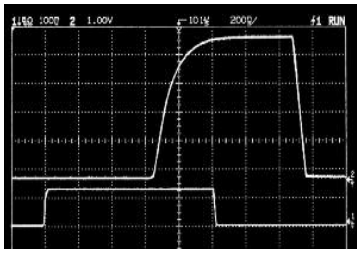


Control Resistance vs. Threshold Power (dBm)

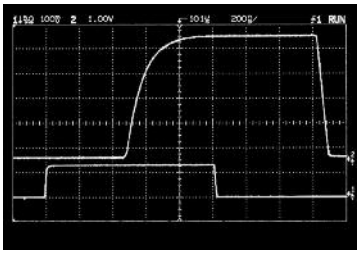


Control Voltage and Resistance vs. Input Power (dBm)





Pulse Response @ R_{TH} =120 Ohms



Pulse Response @ R_{TH} = 2800 Ohms

Top Trace: TTL Logic Out
Bottom Trace: RF Input
Time Base: 200 ηs/div