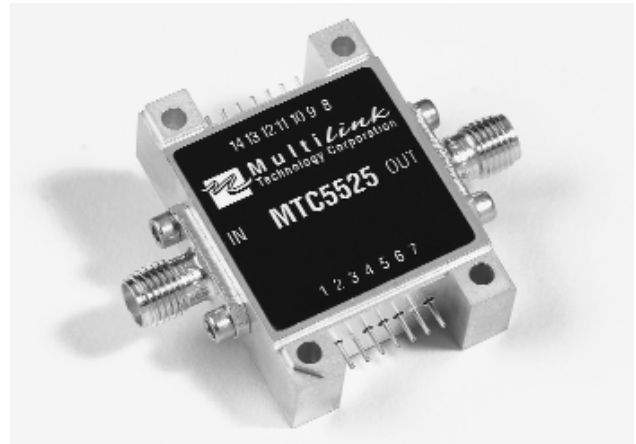


### Applications

- Driver for LiNbO<sub>3</sub> modulator in high bit rate SONET/SDH transmission systems

### Features:

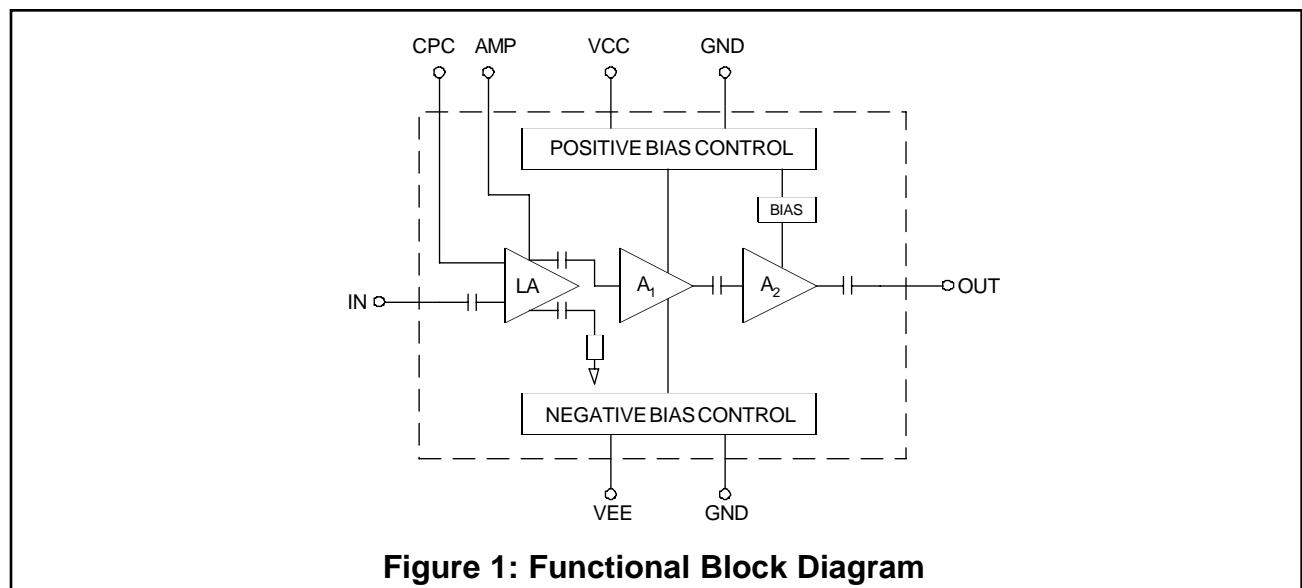
- High sensitivity input limiter
- 7.25 Voltage amplitude output
- 2 Volt output amplitude control range
- Operates up to 11.0 Gb/s
- Low jitter
- Small form factor



### Description

The MTC5525 is a precision GaAs module for driving LiNbO<sub>3</sub> modulators. It provides an AC coupled single-ended input and output, amplitude control and crossing point control. The input stage of the MTC5525 provides a limiting amplifier function to ensure high quality output signal characteristics, even with less than optimal input signals. Key specifications include the MTC5525's low output jitter, high voltage drive capability, high input sensitivity, wide output amplitude control range, small form factor and it's ability to drive at up to 11.0 Gb/s. In addition, the MTC5525's amplitude control feature is specially designed to provide consistent output signal shape over the range of control.

The MTC5525 uses field-replaceable SMA connectors that can be specified as male or female. The module is hermetically sealed and can operate over a case temperature range of -5°C to 70°C and consumes 6W of power.



**Figure 1: Functional Block Diagram**

**Absolute Maximum Ratings**

Caution: Exceeding the absolute maximum ratings may cause damage to this product and/or lead to reduced reliability. Functional performance is specified over the recommended operating conditions for power supply and temperature only. Electrical characteristics at, or beyond, the absolute maximum ratings are not assured or implied.

Parameter	Min	Max	Units
Positive Voltage Bias		+11	V
Negative Voltage Bias	-6		V
Output Amplitude Control Voltage	-6	+6	V
Crossing Point Control	$-2 * V_{in\ pp}$	$+2 * V_{in\ pp}$	V
Output DC Offset Control Voltage	-5	+5	V
Input Signal Voltage (pp)		1.2	V
Operating Case Temperature	-10	+80	°C
Storage Temperature	-45	+125	°C
DC Voltage Applied to RF Output Pin	-5	+5	V

**Recommended Operating Conditions and Power Supply Requirements**

Positive Supply Voltage ( $V_{CC}$ ).....	+9.5V (+/- 5%)
Positive Drain Current ( $I_{CC}$ ).....	480 mA
Negative Supply Voltage ( $V_{EE}$ ).....	-5.2 (+/-5%)
Negative Drain Current ( $I_{EE}$ ).....	275 mA
Operating Temperature Range (case).....	-5°C to +70°C

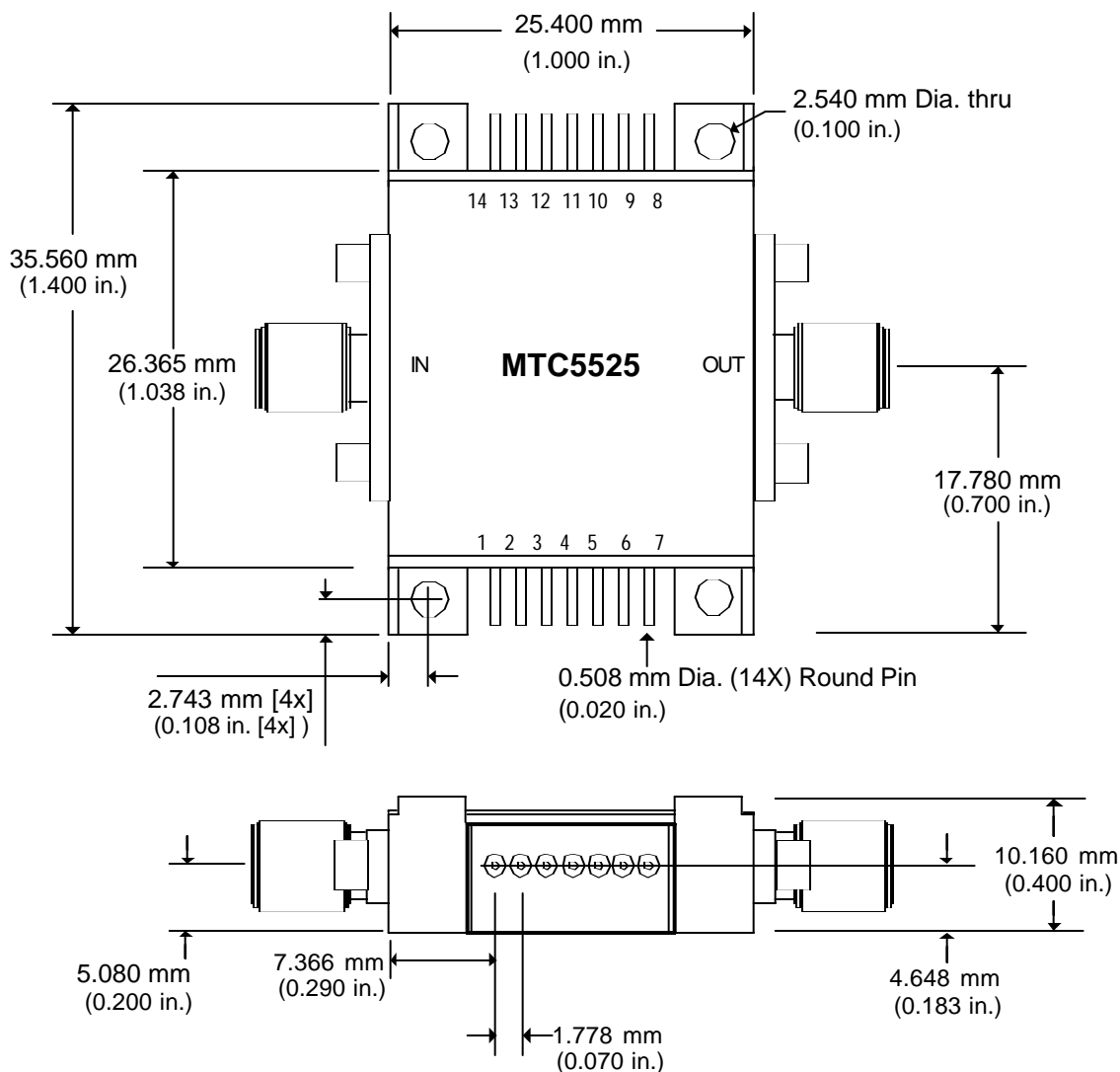
**Electrical Characteristics**
 $V_{CC} = +9.5V$  (+/- 5%),  $V_{EE} = -5.2V$  (+/- 5%),  $T_C = -5^{\circ}C$  to  $70^{\circ}C$ 

 Typical values are  $V_{CC} = +9.5V$ ,  $V_{EE} = -5.2V$ ,  $T_C = 25^{\circ}C$ 

Description	Parameter	Symbol	Min	Typ	Max	Unit	Condition	Notes
Input Data Rate		Data Rate	9		11.0	Gb/s	NRZ	
Low -3dB Bandwidth		$BW_{Lo-3dB}$		30	50	kHz		
Input Match	50 MHz - 10 GHz	$S_{11}$		-15	-10	dB		
Output Match:	50 MHz - 2 GHz	$S_{22}$		-12	-8	dB		
	2.1 GHz - 10 GHz	$S_{22}$		-12	-9	dB		
Input Voltage Range (pp)		$V_{in}$	0.4		1.0	$V_{PP}$		
Output Amplitude Control		$V_{ctrl}$	-5.0		5.0	V		
Output Voltage Amplitude		$V_{amp-min}$			5.25	$V_{amp}$	amp = -5V	1, 2
Output Voltage Amplitude		$V_{amp-max}$	7.25			$V_{amp}$	amp = +5V	1, 2
Output Voltage Ripple		$V_{RIPPLE}$		+/-10	+/-20	%		
10 MHz Pulse Response:	Over/undershoot	$P_R$		10	15	%		
	Droop	$P_R$		10	15	%		
Rise/Fall Time	20% - 80%	$t_r / t_f$		30	38	ps		
Crossing Point Control		CPC	40		60	%		3

**Notes:**

1. Upon request, the factory can adjust the output voltage range to selected higher or lower settings (e.g. 4.5 - 6.5  $V_{amp}$ ).
2.  $V_{amp}$  is the difference between the mean high and mean low signal values (not to be confused with  $V_{pp}$  which is the absolute high and low signal values).
3. Can be left unconnected for normal operation. If left unconnected crossing point will be 50% (+/- 5%).



Input / Output ports 50 Ohm, AC coupled.  
All tolerances +/-0.254 mm (0.01 in.).  
Recommended mounting screw is #2-56.

**Figure 2: Package Dimensions**

(Drawing not to scale)

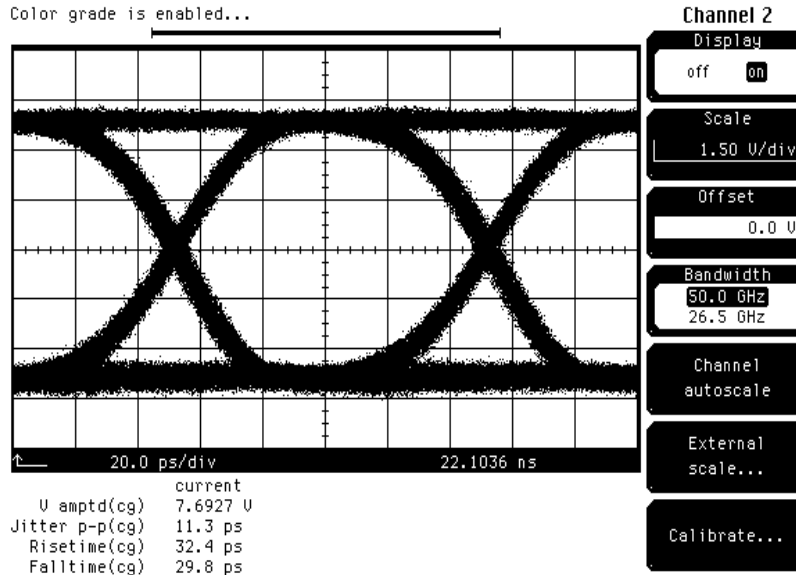
**Pin Assignments**

Pin	Symbol	Parameter
1	$V_{EE}$	Negative Voltage Bias
2	GND	Ground
3	N.C.	No Connect
4	N.C.	No Connect
5	N.C.	No Connect
6	GND	Ground
7	N.C.	No Connect
8	N.C.	No Connect
9	GND	Ground
10	$V_{CC}$	Positive Voltage Bias
11	AMP	Output Amplitude Control
12	N.C.	No Connect
13	GND	Ground
14	CPC	Crossing Point Control
IN	IN	RF Input Port
OUT	OUT	RF Output Port

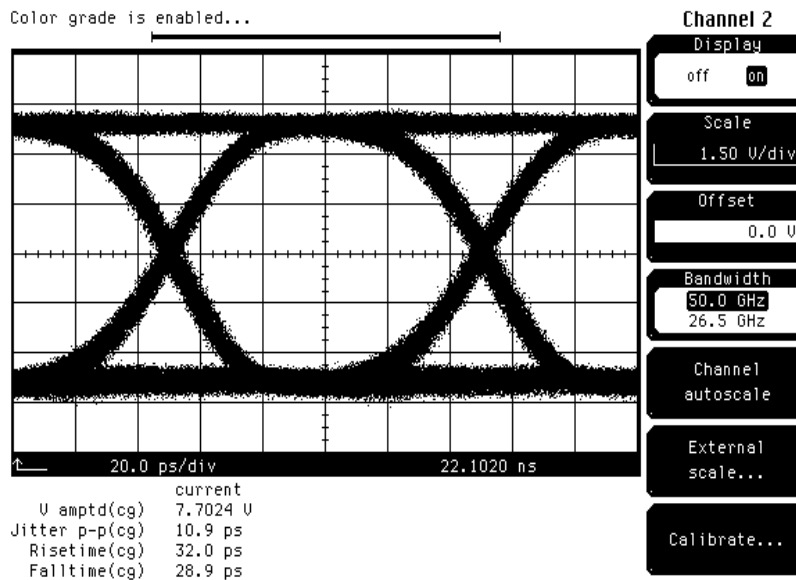
**Typical Output Response**

+V = +9.5V, -V = -5.2V, T<sub>C</sub> = 25°C

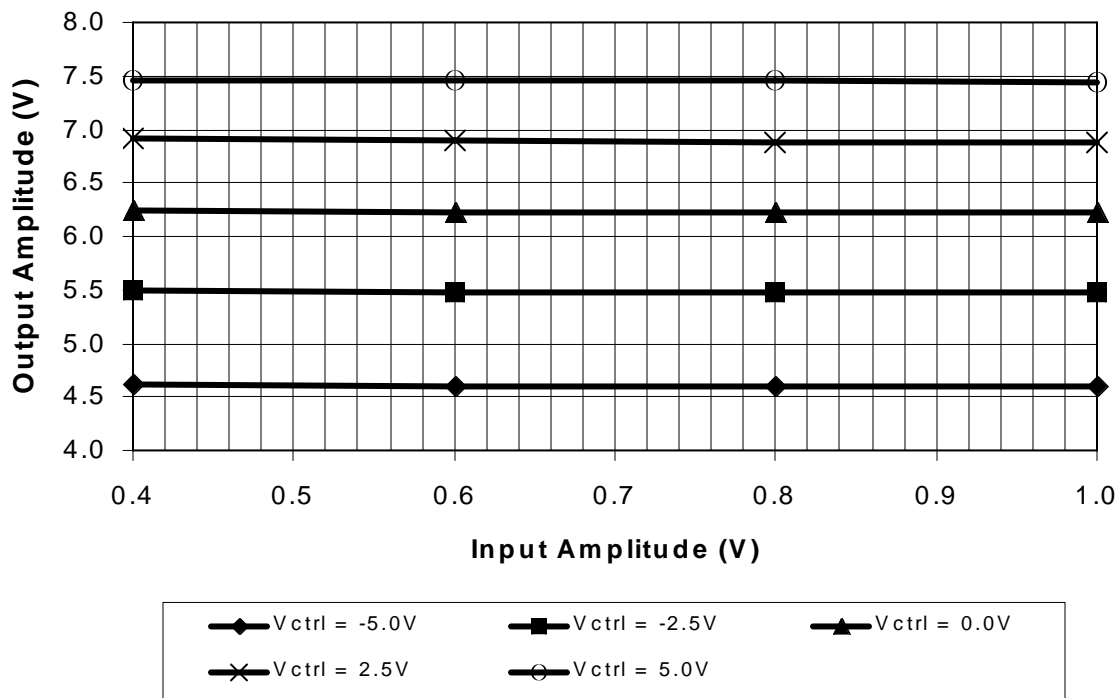
Input Voltage 400mV<sub>pp</sub>, 10 Gb/s, 2<sup>31</sup>-1 PRBS



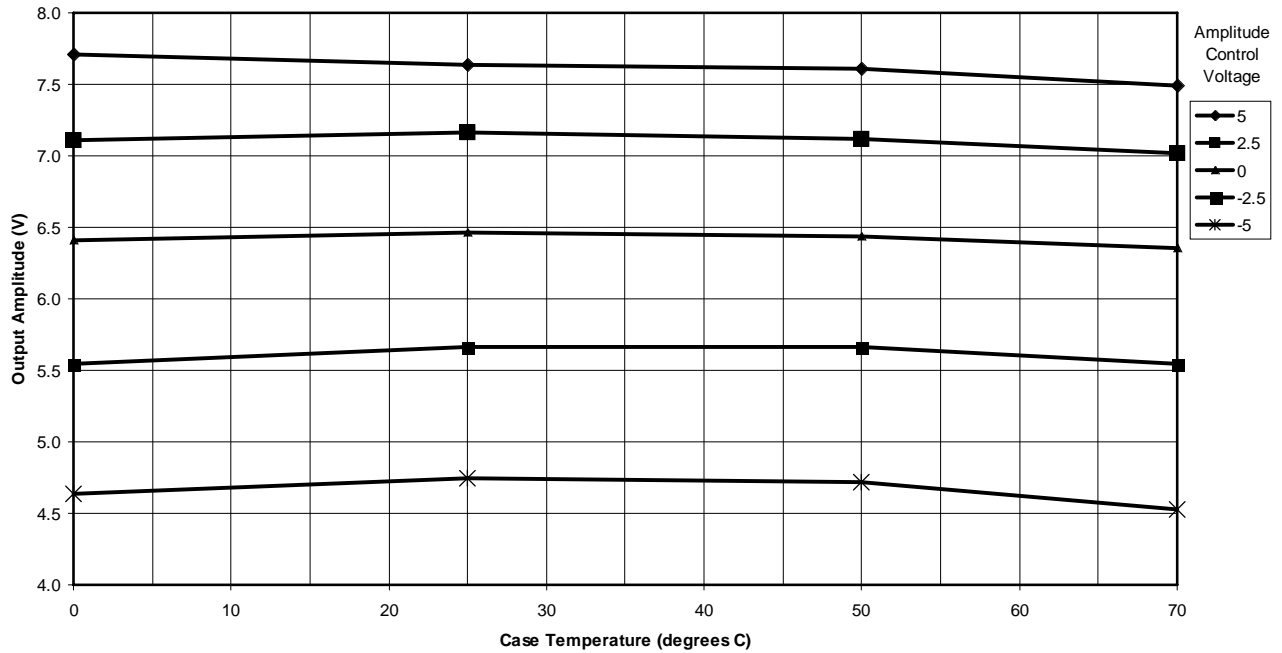
Input Voltage 1000mV<sub>pp</sub>, 10 Gb/s, 2<sup>31</sup>-1 PRBS



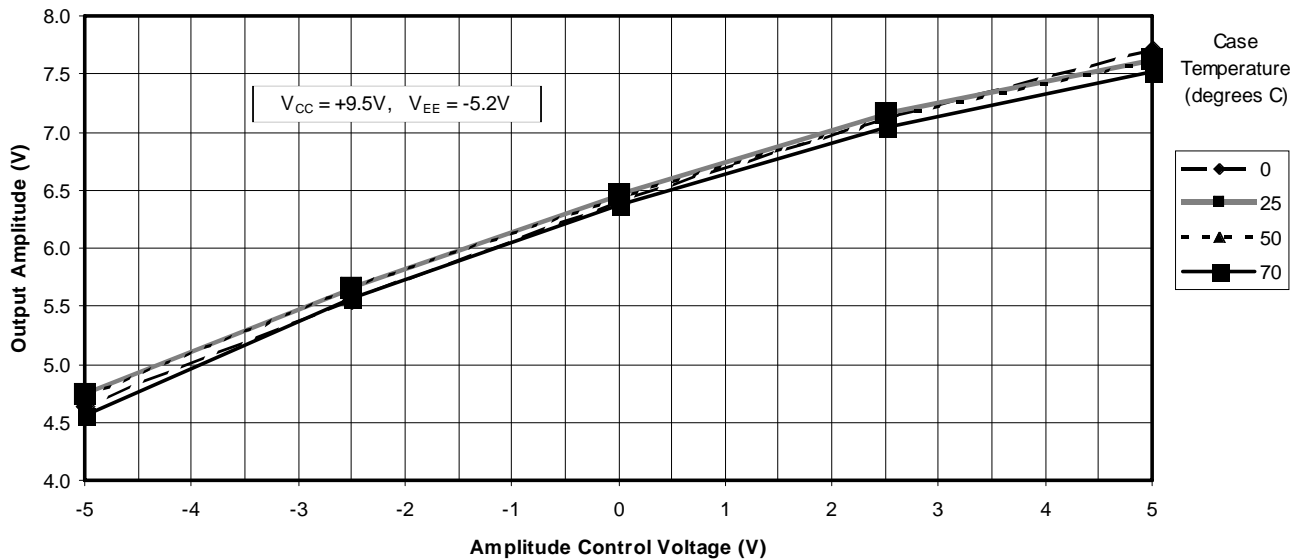
**Figure 3: Output Eye Diagrams**



**Figure 4: Input versus Output Amplitude**



**Figure 5: Output Amplitude versus Temperature**

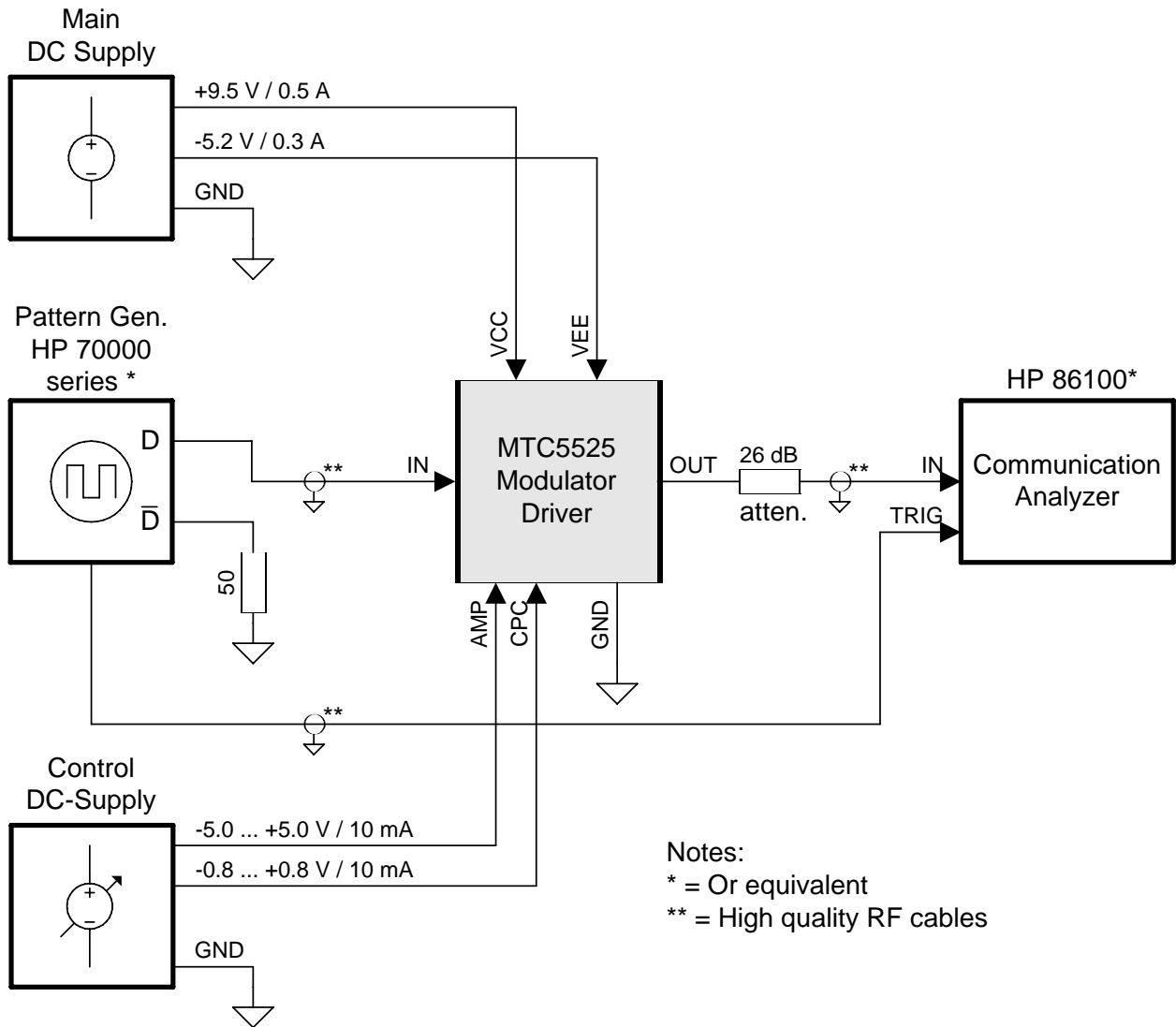


**Figure 6: Amplitude Transfer Curve**



**Limiting Modulator Driver**

**MTC5525  
Preliminary Data Sheet**



**Figure 7: Test Setup Block Diagram**

## Ordering Information

Part #:  
MTC5525

Description:  
Limiting Modulator Driver

**For additional ordering information, please contact  
in the U.S. or Asia/Pacific:**

**in Europe, the Middle East, or Africa:**

Multilink Technology Corporation  
300 Atrium Drive, 2nd Floor  
Somerset, NJ 08873  
Phone: Toll-free in the U.S.A. at  
888-884-5811 or call  
732-537-3700  
Fax: (732) 805-9177  
E-mail: sales@mltc.com

Multilink Technology GmbH  
Bessemerstr. 80  
44793 Bochum, Germany  
Phone: +49 (234) 91 173 12  
Fax: +49 (234) 91 173 18  
E-mail: sales@multilink.de

**Visit Us on the Internet at <<http://www.mltc.com>>**