

TECHNICAL REPORT

ON

2.0 TO 18.0 GHz

(OTHER FREQUENCY RANGES AVAILABLE)

10 nS ULTRA-HIGH SPEED

MINIATURE

-20dBm TO +10dBm DYNAMIC RANGE

THRESHOLD DETECTOR

WITH

TTL OUTPUT LOGIC

(ECL LOGIC AVAILABLE)

PMI MODEL No: TD-30T-SHS-218

(Serial Number: PM60937)

**DESIGNED BY
A. K. GORWARA**

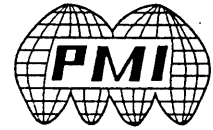
**TESTED BY
R. AFABLE**

**REPORTED BY
P. WOOD**

JANUARY 13, 1998

PLANAR MONOLITHICS INDUSTRIES, INC.

**CORPORATE & ENGINEERING OFFICES: 1112 PERKIOMENVILLE ROAD, PERKIOMENVILLE, PA 18074
SALES & MANUFACTURING OFFICE: 7311-G GROVE ROAD, FREDERICK, MD 21704
TEL No: 301-662-4700 * FAX No: 301-662-4938 * E-MAIL: AMCPMI@AOL.COM**



10 nS ULTRA-HIGH SPEED, 2.0 TO 18.0 GHz THRESHOLD DETECTOR WITH TTL OUTPUT

- MINIATURE SIZE
- 2.0 TO 18.0 GHz
- 10 nS PROPAGATION DELAY
- TTL LOGIC OUTPUT (ECL LOGIC AVAILABLE)
- -20 TO +10dBm DYNAMIC RANGE

PMI MODEL No: TD-30T-SHS-218

SPECIFICATIONS:

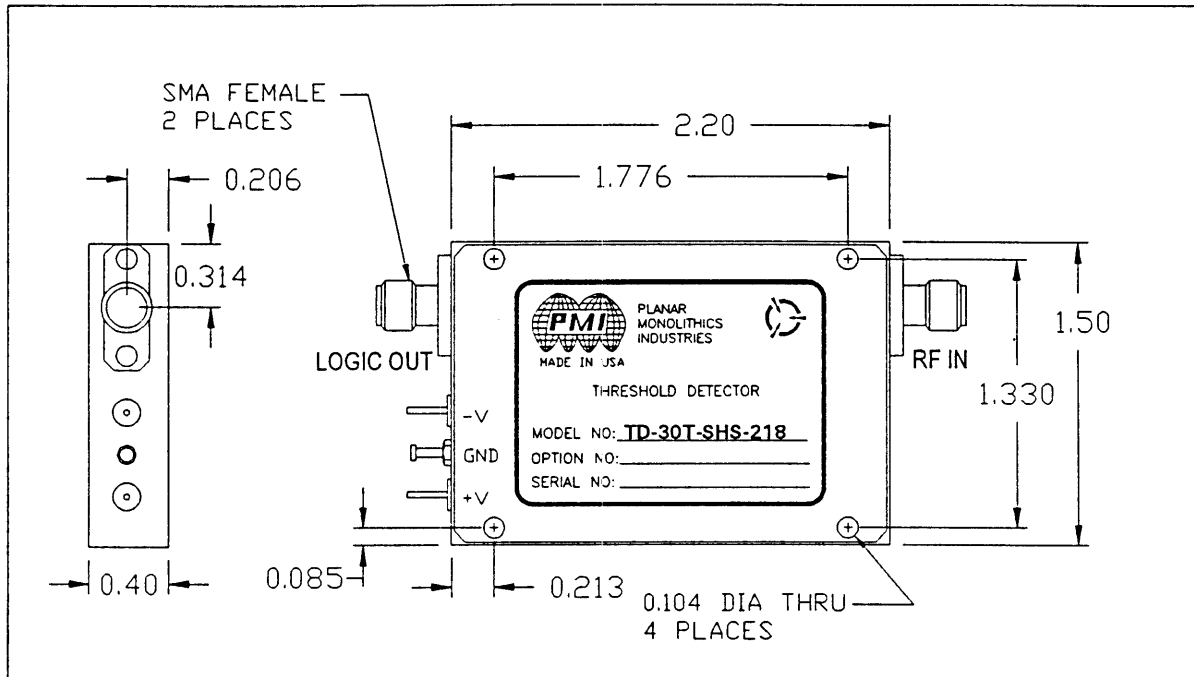
- FREQUENCY RANGE : 2.0 TO 18.0 GHz (USABLE DOWN TO 0.5 GHz)
- VSWR : 3.0:1 @ -20 dBm
- MINIMUM SIGNAL LEVEL FOR LOGIC 1 : -20 dBm @ 2 GHz, -17 dBm @ 18 GHz
- MINIMUM SIGNAL LEVEL FOR LOGIC 0 : -25 dBm TYP.
- THRESHOLD VARIATION OVER FREQUENCY FOR ANY 1 GHz WINDOW : ± 0.5 dB, TYP.
- PROPAGATION DELAY FROM 50% LOGIC OUTPUT ON LEADING EDGE FOR AN INPUT OF -20 dBm : 15 nS MAX., 10 nS TYP.
- PROPAGATION DELAY FROM 50% RF INPUT TO 50% LOGIC WHEN INPUT IS -10 dBm : 15 nS MAX., 10 nS TYP.
- OUTPUT PULSE WIDTH (50% POINTS) WHEN INPUT IS BETWEEN -20 dBm TO -10 dBm : WITHIN 15 nS OF INPUT PULSE WIDTH, 10 nS TYP.
- OUTPUT PULSE WIDTH (50% POINTS) WHEN INPUT IS BETWEEN -20 dBm TO +10 dBm : WITHIN 25 nS OF INPUT PULSE WIDTH
- DC POWER (NO LOAD) : ± 15 vdc @ ± 100 mA MAX., +50 mA, -80 mA TYP.
- SIZE/WEIGHT : 2.2" X 1.5" X 0.4", ≤ 3 oz.

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MECHANICAL OUTLINE



THRESHOLD DETECTOR WITH TTL LOGIC OUTPUT MODEL No: TD-30T-SHS-218

ENVIRONMENTAL RATINGS

- TEMPERATURE -54°C TO +85°C (OPERATING)
-65°C TO +100°C (STORAGE)
- HUMIDITY MIL-STD-202F, METHOD 103B COND. B
- SHOCK MIL-STD-202F, METHOD 213B COND. B
- VIBRATION MIL-STD-202F, METHOD 204D COND. B
- ALTITUDE MIL-STD-202F, METHOD 105C COND. B
- TEMPERATURE CYCLE MIL-STD-202F, METHOD 107D COND. A

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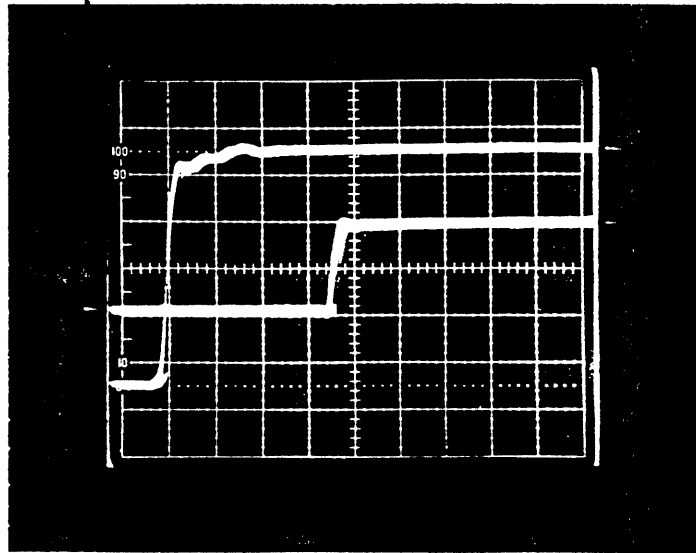
PROPAGATION DELAY @ 2 GHz

MODEL No: TD-30T-SHS-218 SERIAL No: PM60937
PULSE LEADING EDGE

10 nS/div. TD-30-SHS-218-TTL

VERTICAL SCALE:
0.1 Volt Per Division

HORIZONTAL SCALE:
10nS Per Division



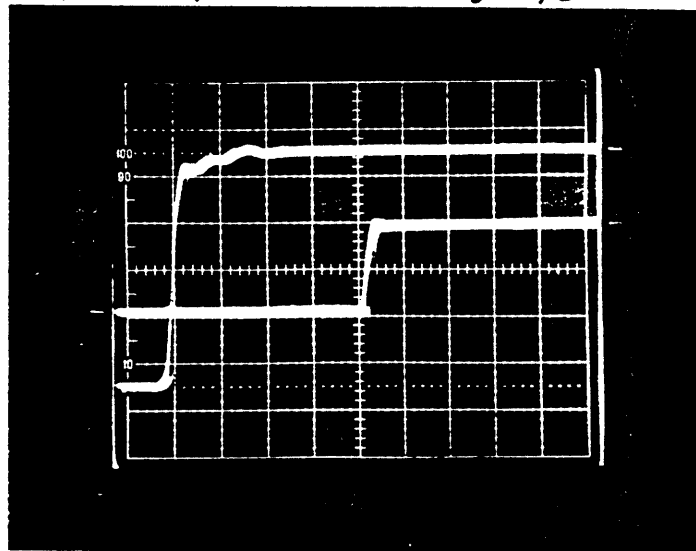
1V/div 2 GHz +10 dBm

+ 10 dBm INPUT POWER

10 nS/div. TD-30-SHS-218-TTL

VERTICAL SCALE:
0.1 Volt Per Division

HORIZONTAL SCALE:
10nS Per Division



1V/div. 2 GHz -17 dBm

-17 dBm INPUT POWER

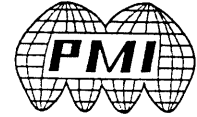
(SUBTRACT 30 nS DELAY THROUGH SWITCHING SET UP FOR ALL LEADING EDGE PHOTOS)

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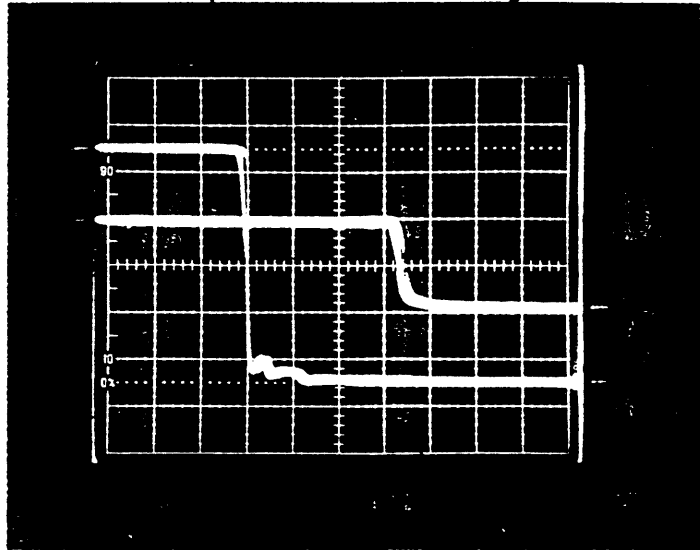
PROPAGATION DELAY @ 2 GHz

MODEL No: TD-30T-SHS-218 SERIAL No: PM60937
PULSE TRAILING EDGE

10ns/div TD-30-SHS-218-TTL

VERTICAL SCALE:
0.1 Volt Per Division

HORIZONTAL SCALE:
10nS Per Division



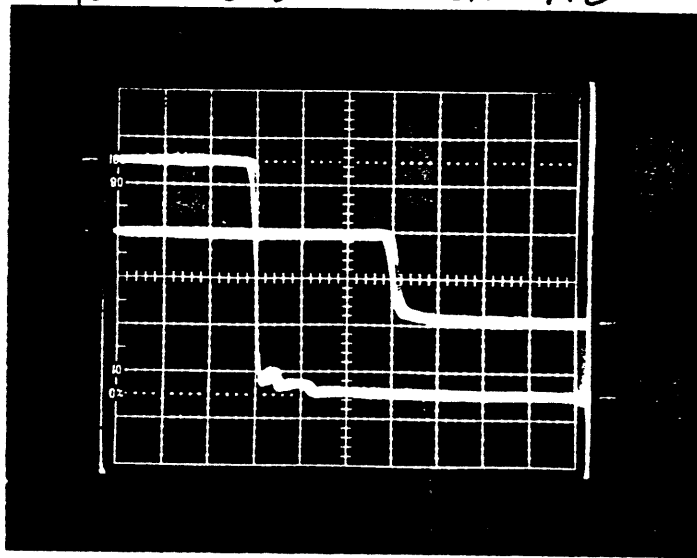
1V/div 20ns +10dbm

+ 10 dBm INPUT POWER

10ns/div TD-30-SHS-218-TTL

VERTICAL SCALE:
0.1 Volt Per Division

HORIZONTAL SCALE:
10nS Per Division



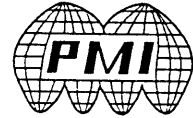
1V/div 20ns 0dbm

0 dBm INPUT POWER

(SUBTRACT 12 ns DELAY THROUGH SWITCHING SET UP FOR ALL TRAILING EDGE PHOTOS)

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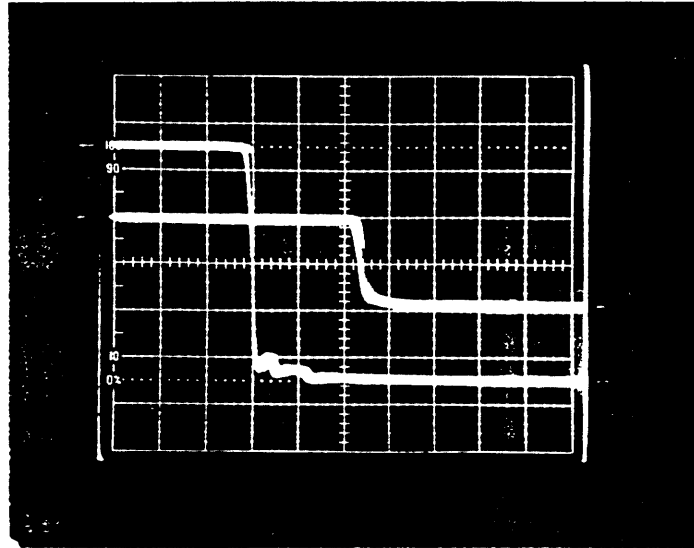
PROPAGATION DELAY @ 2 GHz

MODEL No: TD-30T-SHS-218 SERIAL No: PM60937
PULSE TRAILING EDGE

10ns/div. TD-30-SHS-218-TTL

VERTICAL SCALE:
0.1 Volt Per Division

HORIZONTAL SCALE:
10nS Per Division



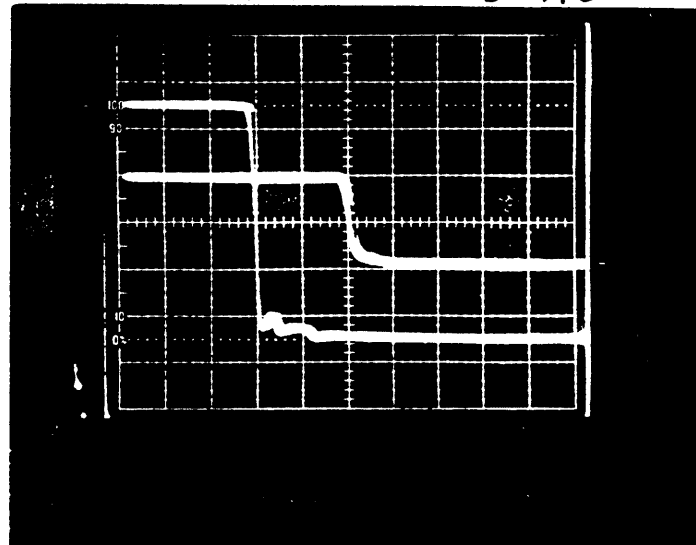
1V/div. 2 GHz -10dbm

-10 dBm INPUT POWER

10 ns/div. TD-30-SHS-218-TTL

VERTICAL SCALE:
0.1 Volt Per Division

HORIZONTAL SCALE:
10nS Per Division



1V/div. 2 GHz -17dbm

-17 dBm INPUT POWER

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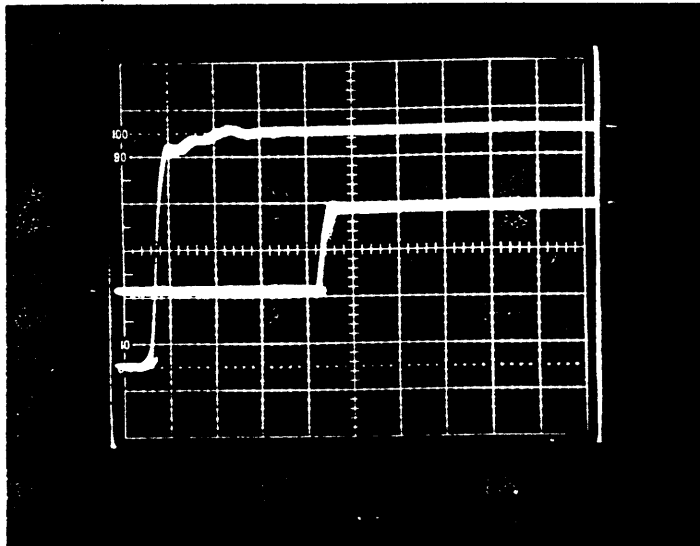


PROPAGATION DELAY @ 10 GHz
MODEL No: TD-30T-SHS-218 SERIAL No: PM60937
PULSE LEADING EDGE

10 nV/div TD-30-SHS-218-TTL

VERTICAL SCALE:
0.1 Volt Per Division

HORIZONTAL SCALE:
10nS Per Division



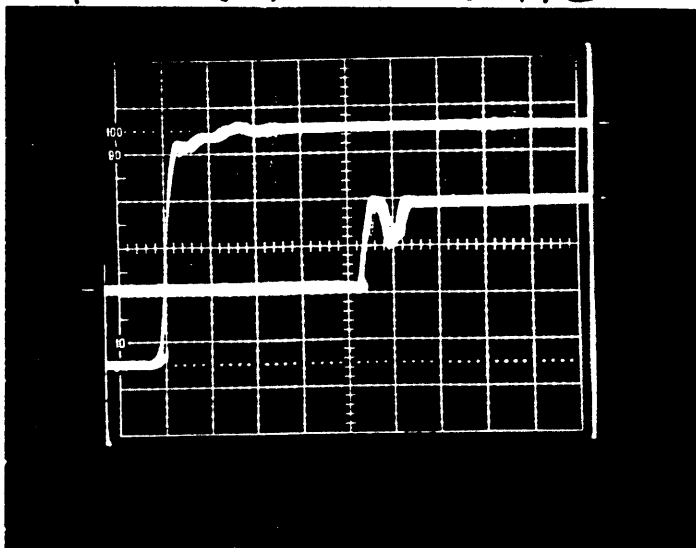
10/div. 10 GHz +10dBm

+ 10 dBm INPUT POWER

10 nV/div TD-30-SHS-218-TTL

VERTICAL SCALE:
0.1 Volt Per Division

HORIZONTAL SCALE:
10nS Per Division



10 GHz -18dBm

-18 dBm INPUT POWER

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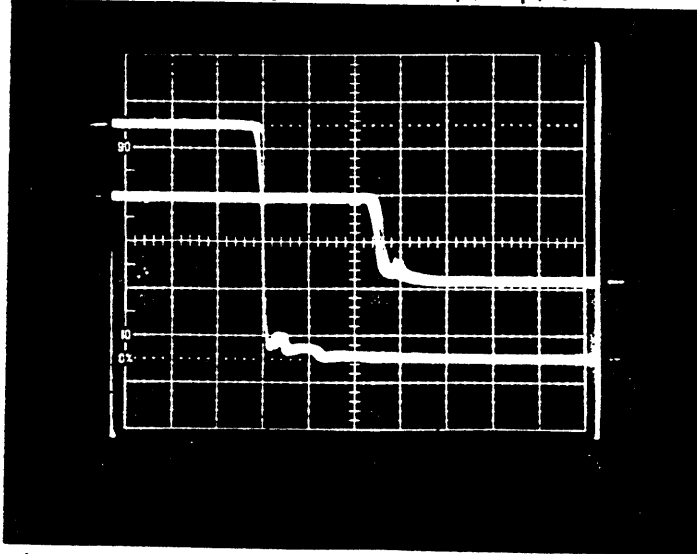


PROPAGATION DELAY @ 10 GHz
MODEL No: TD-30T-SHS-218 SERIAL No: PM60937
PULSE TRAILING EDGE

10 ns/div. TD-30-SHS-218-TTL

VERTICAL SCALE:
0.1 Volt Per Division

HORIZONTAL SCALE:
10nS Per Division



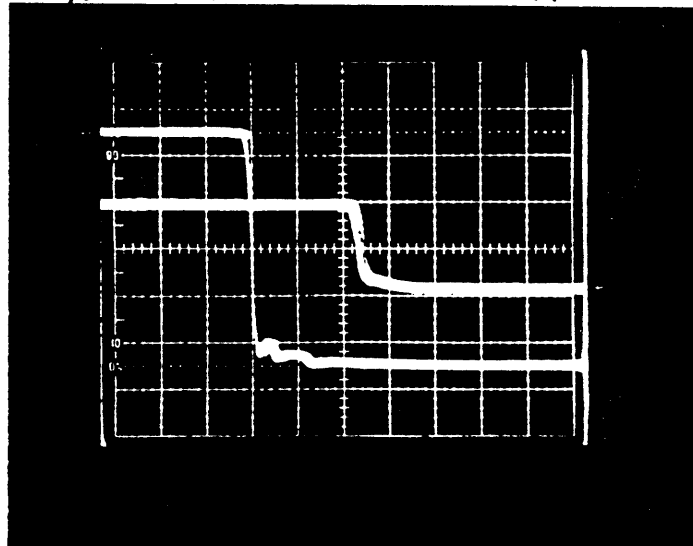
1V/div. 10 GHz +10dBm

+ 10 dBm INPUT POWER

10 ns/div. TD-30-SHS-218-TTL

VERTICAL SCALE:
0.1 Volt Per Division

HORIZONTAL SCALE:
10nS Per Division



1V/div. 10 GHz 0dBm

0 dBm INPUT POWER

(SUBTRACT 12 ns DELAY THROUGH SWITCHING SET UP FOR ALL TRAILING EDGE PHOTOS)

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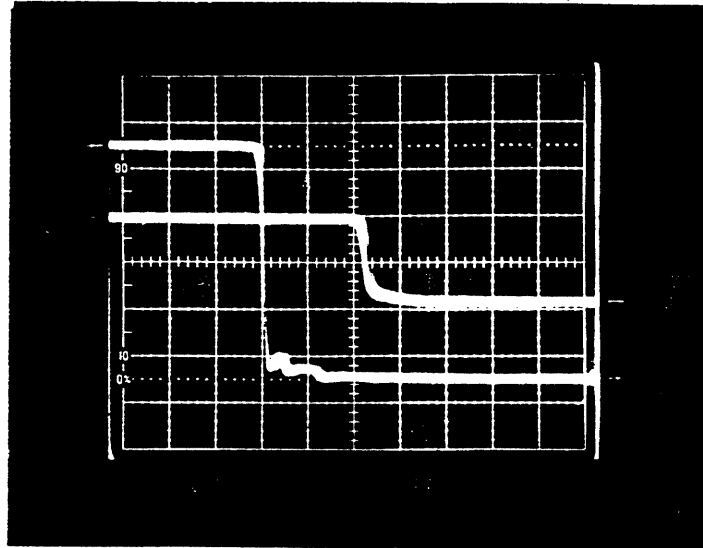
PROPAGATION DELAY @ 10 GHz

MODEL No: TD-30T-SHS-218 SERIAL No: PM60937
PULSE TRAILING EDGE

10ns/div. TD-30-SHS-218-TTL

VERTICAL SCALE:
0.1 Volt Per Division

HORIZONTAL SCALE:
10nS Per Division



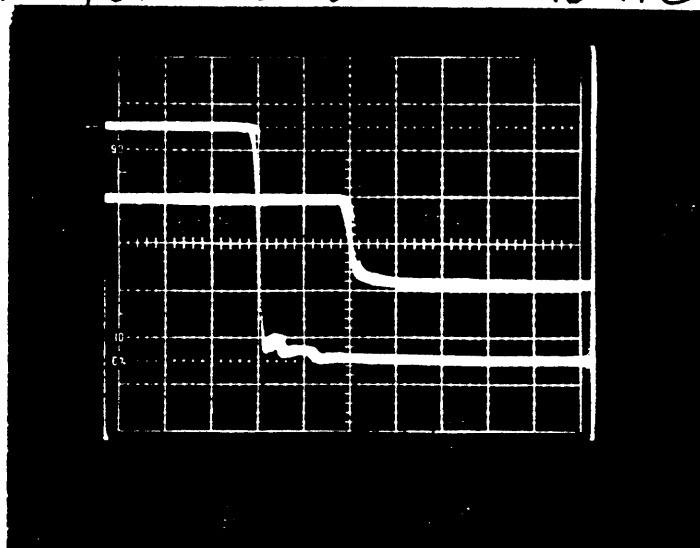
1V/div. 10 GHz. -10 dBm

-10 dBm INPUT POWER

10ns/div. TD-30-SHS-218-TTL

VERTICAL SCALE:
0.1 Volt Per Division

HORIZONTAL SCALE:
10nS Per Division



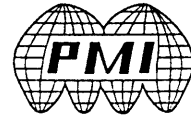
1V/div. 10 GHz. -18 dBm

-18 dBm INPUT POWER

(SUBTRACT 12 nS DELAY THROUGH SWITCHING SET UP FOR ALL TRAILING EDGE PHOTOS)

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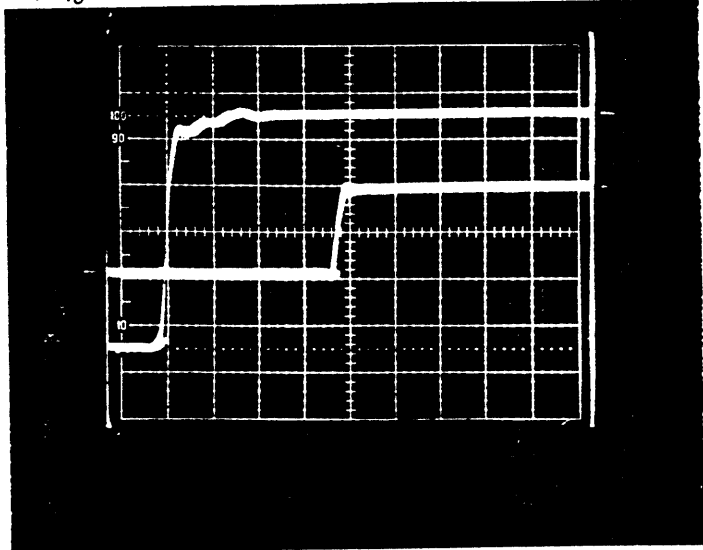
PROPAGATION DELAY @ 18 GHz

MODEL No: TD-30T-SHS-218 SERIAL No: PM60937
PULSE LEADING EDGE

10ns/div: TD-30-SHS-218-TTL

VERTICAL SCALE:
0.1 Volt Per Division

HORIZONTAL SCALE:
10nS Per Division



S/N: PM60937

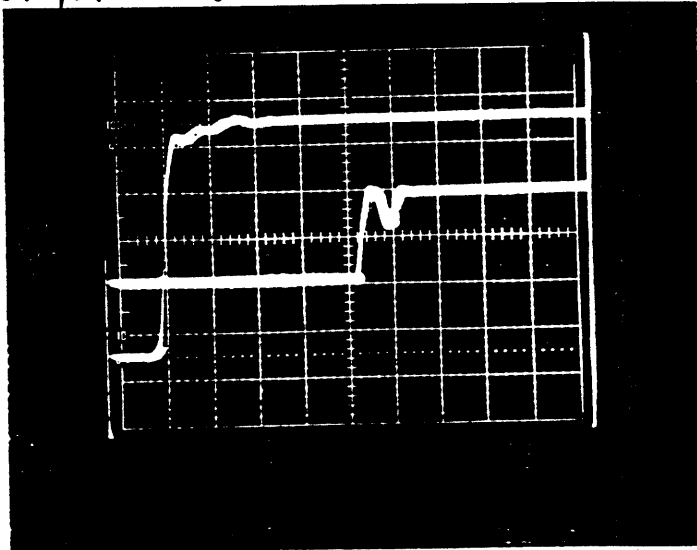
1V/div 18 GHz +8dBm

+ 8 dBm INPUT POWER

10ns/div: TD-30-SHS-218-TTL

VERTICAL SCALE:
0.1 Volt Per Division

HORIZONTAL SCALE:
10nS Per Division



S/N: PM60937

1V/div 18 GHz -15dBm

-15 dBm INPUT POWER

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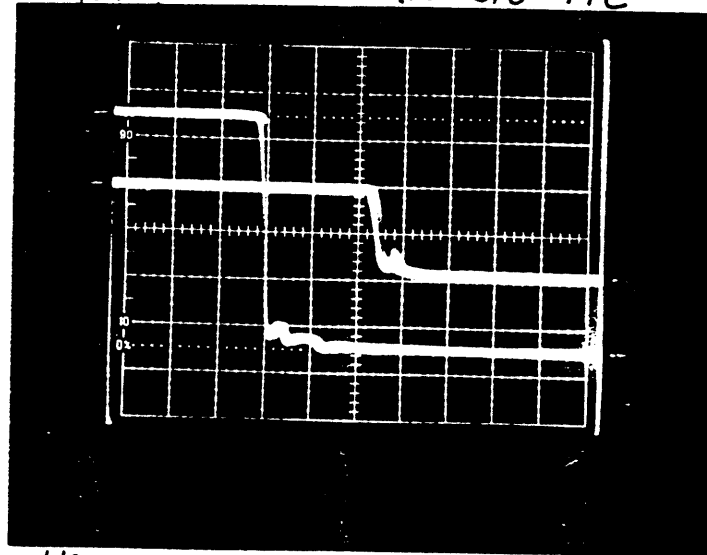
PROPAGATION DELAY @ 18 GHz

MODEL No: TD-30T-SHS-218 SERIAL No: PM60937
PULSE TRAILING EDGE

10 ns/div. TD-30-SHS-218-TTL

VERTICAL SCALE:
0.1 Volt Per Division

HORIZONTAL SCALE:
10nS Per Division



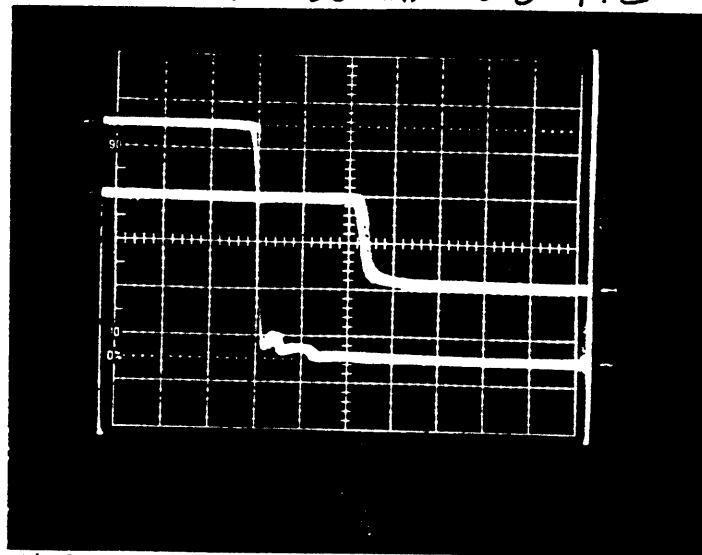
1V/div. 18 GHz. +8 dBm

+ 8 dBm INPUT POWER

10 ns/div. TD-30-SHS-218-TTL

VERTICAL SCALE:
0.1 Volt Per Division

HORIZONTAL SCALE:
10nS Per Division



1V/div. 18 GHz. 0 dBm

0 dBm INPUT POWER

(SUBTRACT 12 ns DELAY THROUGH SWITCHING SET UP FOR ALL TRAILING EDGE PHOTOS)

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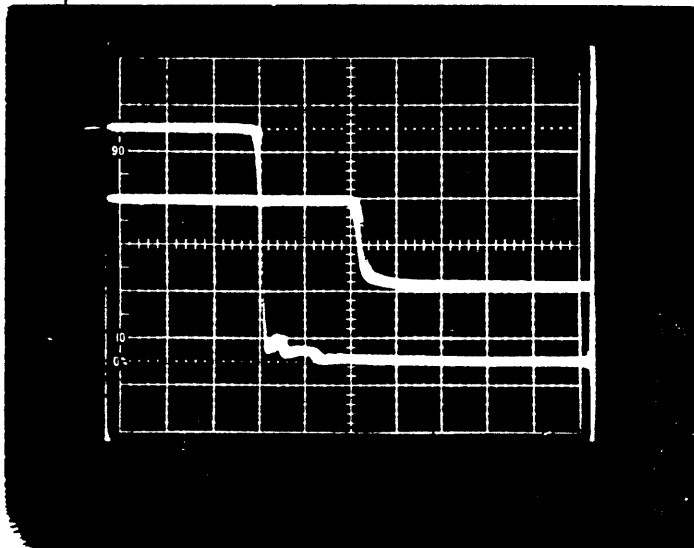
PROPAGATION DELAY @ 18 GHz

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PULSE TRAILING EDGE

10nS/div TD-30-SHS-218-TTL

VERTICAL SCALE:
0.1 Volt Per Division

HORIZONTAL SCALE:
10nS Per Division



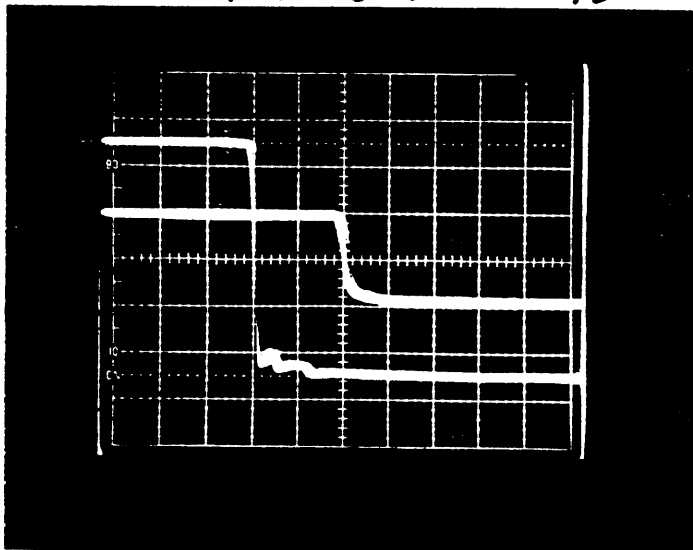
1V/div. 18 GHz. -10 dBm

-10 dBm INPUT POWER

10nS/div. TD-30-SHS-218-TTL

VERTICAL SCALE:
0.1 Volt Per Division

HORIZONTAL SCALE:
10nS Per Division



1V/div. 18 GHz. -15 dBm

-15 dBm INPUT POWER

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