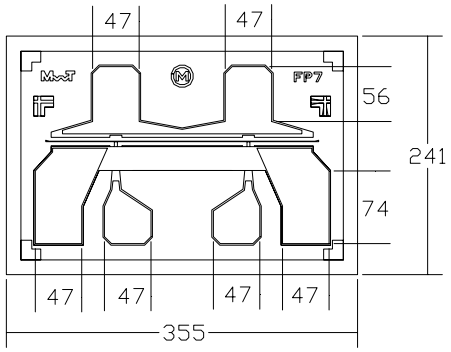
MwT-PH7

28 GHz Medium Power AlGaAs/InGaAs PHEMT
May 2011

Features:

- **+24.0 dBm Output Power at 12 GHz**
- **13.5 dB Small Signal Gain at 12 GHz**
- **60% PAE at 12 GHz**
- **0.3 x 250 Micron Refractory Metal/Gold Gate**
- **Excellent for High Power, Gain, and High Power Added Efficiency up to 28 GHz**
- **Ideal for Commercial, Military, Hi-Rel Space Applications**



Chip Dimensions: 356 x 241 microns
Chip Thickness: 100 microns

Description:

The MwT-PH7 is a AlGaAs/InGaAs PHEMT (Pseudomorphic-High-Electron-Mobility-Transistor) device whose nominal 0.3 micron Gate length and 250 micron gate width make it ideally suited for applications requiring high-gain and medium power up to 28 GHz frequency range. The device is equally effective for either wideband (e.g. 6 to 18 GHz) or narrow-band applications. The chip is produced using MwT's reliable metal systems and all devices from each wafer are screened to insure reliability. All chips are passivated using MwT's patented "Diamond-Like Carbon" process for increased durability.

Electrical Specifications:

- ***at Ta= 25 ℃***

SYMBOL	PARAMETERS & CONDITIONS	FREQ	UNITS	MIN	TYP
P1dB	Output Power at 1dB Compression Vds=6.0 V Ids=0.75xIDSS=60 mA	12 GHz	dBm	22.0	24.0
SSG	Small Signal Gain Vds=6.0 V Ids=0.75xIDSS=60 mA	12 GHz 18 GHz	dB	12.0	13.5 10.0
PAE	Power Added Efficiency at P1dB Vds=7.0 V Ids=0.75xIDSS=60 mA	12 GHz	%		60
IDSS	Recommended IDSS Range for Optimum P1dB		mA		58- 110

DC Specifications:

- ***at Ta= 25 ℃***

SYMBOL	PARAMETERS & CONDITIONS	UNITS	MIN	TYP	MAX
IDSS	Saturated Drain Current Vds=3.0 V Vgs=0.0 V	mA	50		122
Gm	Transconductance Vds=2.5 V Vgs=0.0 V	mS	50	80	
Vp	Pinch-off Voltage Vds=3.0 V Ids=1.0 mA	V		-1.2	-2.5
BVGSO	Gate-to-Source Breakdown Voltage Igs= -0.3 mA	V	-5.0	-8.0	
BVGDO	Gate-to-Drain Breakdown Voltage Igd= -0.3 mA	V	-10.0	-13.0	
Rth	Thermal MwT-PH7 Chip	C/W		150	

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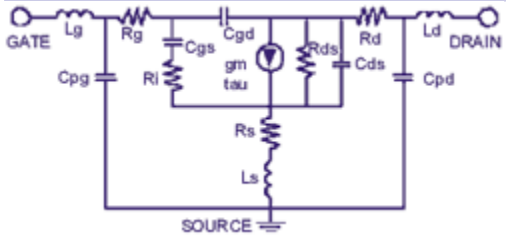
Resistance	**MwT-PH770, PH773**	**160-200***

*** Overall Rth depends on case mounting**

DEVICE EQUIVALENT CIRCUIT



PARAMETER		VALUE	
Source Resistance	**Rs**	**2.60**	ohm
Source Inductance	**Ls**	**0.025**	nH
Drain-Source Resistance	**Rds**	**400**	ohm
Drain-Source Capacitance	**Cds**	**0.070**	pF
Drain Resistance	**Rd**	**3.67**	ohm
Drain Pad Capacitance	**Cpd**	**0.027**	pF
Drain Inductance	**Ld**	**0.159**	nH
Gate Bond Wire Inductance	**Lg**	**0.089**	nH
Gate Pad Capacitance	**Cpg**	**0.050**	pF
Gate Resistance	**Rg**	**0.20**	ohm
Gate-Source Capacitance	**Cgs**	**0.50**	pF
Channel Resistance	**Ri**	**6.00**	ohm
Gate-Drain Capacitance	**Cgd**	**0.03**	pF
Transconductance	**gm**	**90.0**	mS
Transit Time	**tau**	**3.02**	psec

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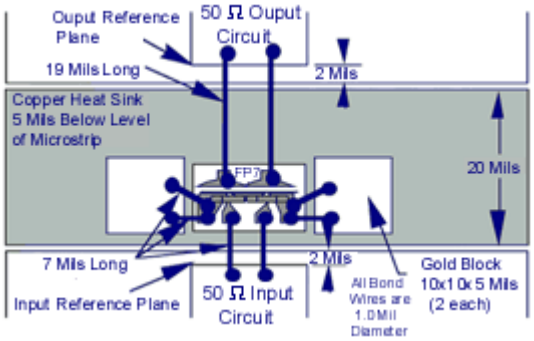
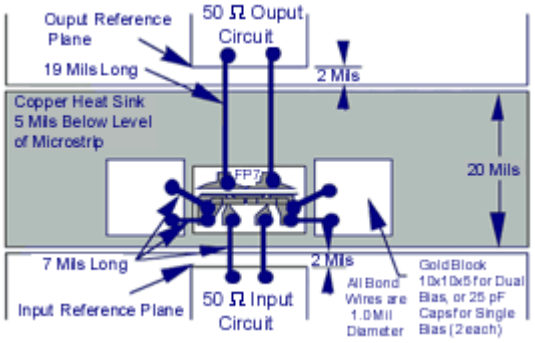
DUAL BIAS



MwT-PH7
SELF BIAS



MAXIMUM RATINGS AT Ta = 25 °C

Symbol	Parameter	Units	Cont Max1	Absolute Max2
VDS	Drain to Source Voltage	V	6.5	7.0
Tch	Channel Temperature	°C	+150	+175
Tst	Storage Temperature	°C	-65 to+150	+175
Pin	RF Input Power	mW	80	120
Pt	Total Power Dissipation	mW	800	1000

Notes:

1. **Exceeding any one of these limits in continuous operation may reduce the mean-time- to-failure below the design goal.**
2. **Exceeding any one of these limits may cause permanent damage.**

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