GaAs Foundry Services
PROCESS PE3 PE3

V2.00

Features

- 0.5 µm MBE MESFET Technology for High Power Applications
- MMICs up to 18 GHz
- 100 mm wafer diameter
- Layout and design assistance
- Space qualification
- Custom test and packaging

Description

M/A-COM's PE3 process utilizes molecular beam epitaxy (MBE) to implement a MESFET active layer structure that achieves high efficiency and breakdown for multi-watt power applications thru 18GHz. The focus is on products for moderate to high volume applications. M/A-COM offers a full compliment of foundry services to meet the requirements for custom designing a MMIC-based die or packaged product.

Typical RF Performance

FC06 (6X150) 900 um FET

Param.	Test Conditions	Freq.	Typ. Val.
MAG	V_{DS} = 8V, I_{DS} = .40I_{DSS}	2/12GHz	22/13.5dB
P_{SAT}	V_{DS} = 8V, I_{DS} = .40I_{DSS}	2/12GHz	680/525mW/mm
PAE	V_{DS} = 8V, I_{DS} = .40I_{DSS}	2/12GHz	50/41%
ft	V_{DS} = 8V, I_{DS} = .40I_{DSS}	------	20GHz

Ordering Information

Part Number	Description
FE43-0001	PE3 Wafer
SVC6310	Mask Set

Electrical Specifications: T_A = +25 °C

Parameter	Test Conditions	Units	Min.	Typ.	Max.
200um PCM FET					
IDSS	VDS = 3V, VGS = 0V	mA/mm	180	240	310
DC GM	VDS = 3V, IDS = 0.5IDSS	mS/mm	125	150	185
Vp	VDS = 3V, IDS = 0.025IDSS	V	-1.2	-1.8	-2.2
BVgd	IG = 0.1mA/mm	V	-11	-15	-
RF GM	VDS = 3V, IDS = 0.5IDSS	mS	25	32	45
Cgs	VDS = 3V, IDS = 0.5IDSS	pF	.140	.200	.280
Cgd	VDS = 3V, IDS = 0.5IDSS	pF	.015	.022	.028
Cds	VDS = 3V, IDS = 0.5IDSS	pF	.025	.038	.050
Ft	VDS = 3V, IDS = 0.5IDSS	GHz	20	26	34
Sheet Resistances					
NDRS (N- GaAs)	I = 20mA	Ohms/sq	340	375	410
NCRS (NiCr)	I = 10mA	Ohms/sq	42	50	58
GFRS (Gate Metal)	I = 20mA	Ohms/sq	-	.027	.040
MIM Capacitors					
Capacitance/unit area	f = 1MHz	pF/mm^2	360	400	440
Capacitor Leakage	V = 10V	µA	-	-	0.5

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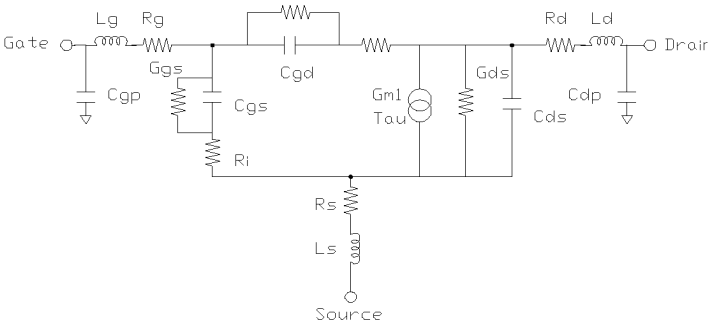
Normalized Nominal Models

Parameter	25% I_{DSS} 8 V_{DS}	50% I_{DSS} 8 V_{DS}
I_{DS} mA/mm	62.62	127.96
g_m mS/mm	140.37	155.44
C_{gs} pF/mm	1.178	1.303
C_{gd} pF/mm	0.072	0.059
C_{ds} pF/mm	0.172	0.185
T_d pS	5.574	5.502
R_i Ohms-mm	2.093	1.729
G_{ds} mS/mm	9.214	7.929
G_{gs} mS/mm	0.168	0.093
R_g Ohms/mm	47.996	47.996
R_s Ohms-mm	0.827	0.827
R_d Ohms-mm	0.865	0.865
L_g nH/Finger	0.108	0.108
L_d nH/Finger	0.108	0.108
C_{gp} pF/mm	0.148	0.148
C_{dp} pF/mm	0.148	0.148

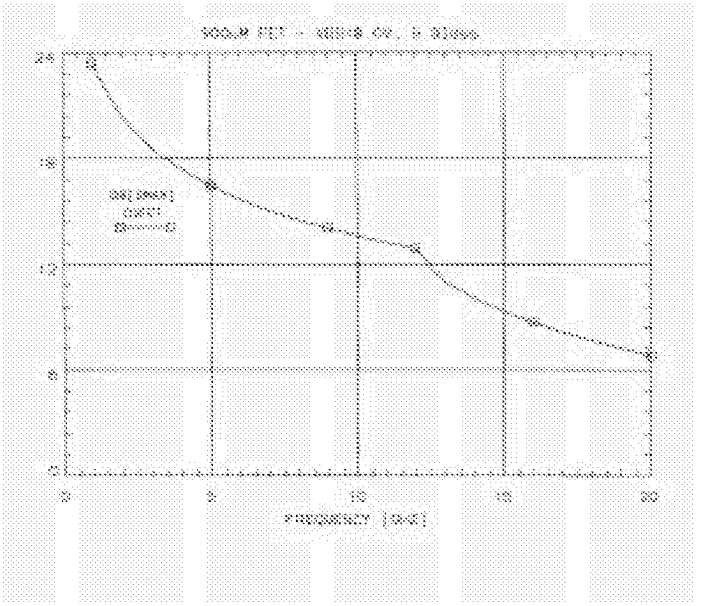


Mask Layer Assignments

LAYER	PROCESS CODE	PROCESS DESCRIPTION
3	OH	Ohmic
4	BI	Boron Isolation
5	RD	Resistor Deposition
7	GF	Gate Finger
8	GL	Gate Interconnect
10	TV	Top via
11	OL	Overlay
12	AP	Air-post
13	AS	Air-Span
25	BV	Back-via
28	FP	Final Passivation
29	ST	Saw Street

NOTE: Unused layer numbers are reserved for future use.

GMAX - 900um FET



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