

Integrated Circuit

MGF8002

frequency divider IC

1GHz / 128 divide

DATASHEET

OEM –Mitsubishi

Source: Mitsubishi Databook 1989

MITSUBISHI GaAs INTEGRATED CIRCUIT <GaAs DIGITAL IC>
MGF8000 Series (MGF8002)
1/128, 1/129 2-MODULUS HIGH SPEED GaAs PRESCALER

DESCRIPTION

MGF8002 is a high speed GaAs frequency divider by using a source coupled FET logic. This IC shows 2-modulus operation (1/128, 1/129) at a frequency range over 1.0 GHz with low dissipative current.

FEATURES

- High speed ($f_{max} = 1.0 \text{ GHz}$)
- Low dissipative current ($I_D = 5 \text{ mA TYP. @ } V_{DD} = 5\text{V}$)
- High output power ($V_O \geq 0.5\text{V @ } R_L = 10\text{K}\Omega$)

APPLICATION

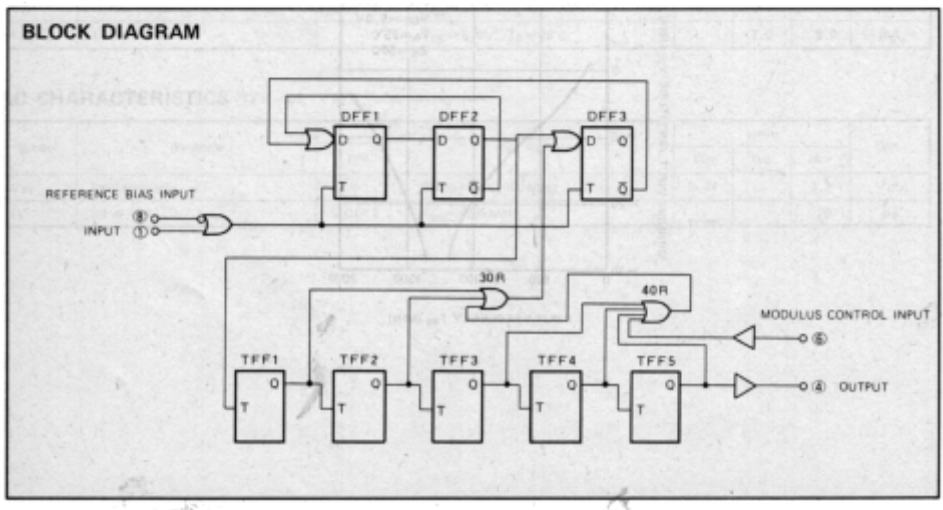
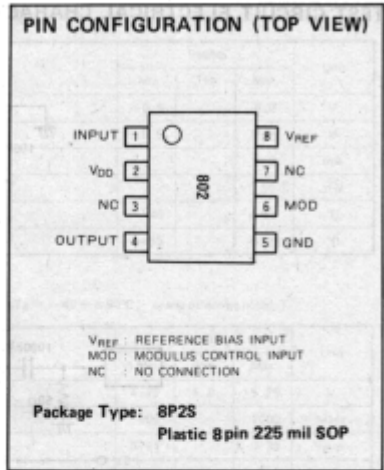
Mobile telephone, Personal radio, MCA radio

QUALITY GRADE

- GG

FUNCTION TABLE

MOD	Divided ratio	MOD Voltage
H	128 Divide	$4.0 \sim V_{DD}$
L	129 Divide	$0\text{V} \sim 1.0\text{V or OPEN}$



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ABSOLUTE MAXIMUM RATINGS ($T_A = -40 \sim +90^\circ\text{C}$, unless otherwise noted.)

Symbol	Parameter	Conditions	Ratings			Unit
			Min	Typ	Max	
V_{DD}	Supply voltage		-0.5		6.0	V
V_{IH}	Input voltage		-0.5		V_{DD}	V
I_O	Output current				5.0	mA
P_D	Power dissipation	$T_A = 90^\circ\text{C}$			50	mW
T_{opr}	Operating temperature		-40		+90	$^\circ\text{C}$
T_{stg}	Storage temperature		-55		+125	$^\circ\text{C}$

RECOMMENDED OPERATING CONDITIONS ($V_{DD} = 4.75 \sim 5.25\text{V}$, $T_A = -40 \sim +90^\circ\text{C}$, unless otherwise noted.)

Symbol	Parameter	Conditions	Limits			Unit
			Min	Typ	Max	
V_{DD}	Supply voltage		4.75	5.0	5.25	V
F_{IN}	Input frequency	$V_{IN} = 0.44\text{V}_{p-p} *$	400		1000	MHz
V_{IN}	Input voltage		0.44		1.30	V_{p-p}
I_O	Output current				0.5	mA
C_L	Output load capacitance	$R_L = 10\text{k}\Omega$			8	pF

* Sine wave

ELECTRICAL CHARACTERISTICS ($T_A = -40 \sim +90^\circ\text{C}$, unless otherwise noted.)

Symbol	Parameter	PIN	Test conditions	Limits			Unit
				Min	Typ	Max	
V_{IH}	High-level input voltage	MOD 6	$V_{DD} = 4.75 \sim 5.25\text{V}$	4.0		V_{DD}	V
V_{IL}	Low-level input voltage	MOD 6	$V_{DD} = 4.75 \sim 5.25\text{V}$	0		1.0	V
I_{IH}	High-level input current	MOD 6	$V_{DD} = V_{IH} = 5.25\text{V}$			300	μA
I_{IL}	Low-level input current	MOD 6	$V_{DD} = 5.25\text{V}$, $V_{IL} = 0\text{V}$	-10			μA
V_O	Output voltage	OUT 4	$V_{DD} = 5.0\text{V}$, $R_L = 10\text{k}\Omega$	0.5	1.0		V
I_{DD}	Circuit current		$V_{DD} = 5.0\text{V}$, $T_A = 25^\circ\text{C}$		5.0	6.0	mA

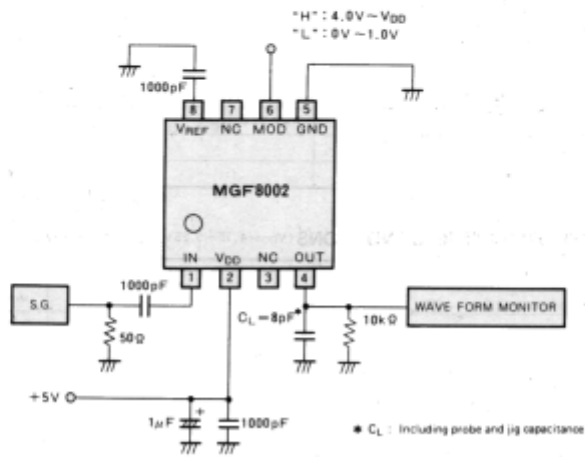
AC CHARACTERISTICS ($T_A = -40 \sim +90^\circ\text{C}$, unless otherwise noted.)

Symbol	Parameter	PIN	Test conditions	Limits			Unit
				Min	Typ	Max	
V_{IN}	Input sensitivity	IN 1	$F_{IN} = 400 \sim 1000\text{MHz}$	0.44		1.3	V_{p-p}
t_S	Set up time	MOD 6	$F_{IN} = 1000\text{MHz}$			20	ns

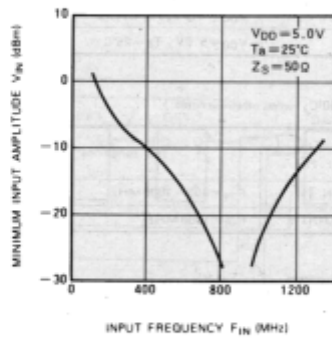
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MGF8000 Series (MGF8002)**

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TEST CIRCUIT ELECTRICAL CHARACTERISTICS

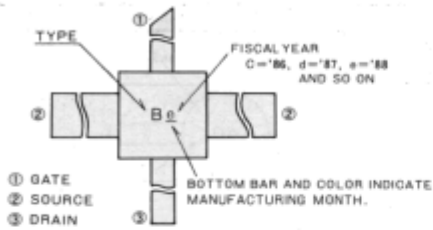


TYPICAL CHARACTERISTICS



**MITSUBISHI SEMICONDUCTOR <GaAs FET>
SYMBOL ON PACKAGE**

EXAMPLE OF SYMBOL ON MICRO DISK PACKAGE



	Without bottom bar	with bottom bar
Blue	Apr.	Oct.
Orange	May	Nov.
Black	June	Dec.
Red	July	Jan.
Green	Aug.	Feb.
Brown	Sep.	Mar.

* Left side character indicates the type number.
* Right side character, bottom bar and the color indicate manufacturing year and month.

**SYMBOL ON PACKAGE
Low Noise GaAs FET & HEMT**

Type	Symbol	Outline	Classification
MGF1100	D	GD-1	Low Noise Dual Gate
MGF1102	E	GD-2	
MGF1202	B	GD-3	
MGF1302	A	GD-4	
MGF1303	B		
MGF1304A	E		
MGF1305	D		
MGF1402	B		GD-9
MGF1412	C		
MGF1403	D		
MGF1404	E		
MGF1405	F		
MGF1423	G		
MGF1425	H		
MGF1501	I	GD-5	Low Noise Dual Gate FET (Mold)
MGF1502	I	GD-6	Low Noise FET (Mold)
MGF1902	A	GD-7	Low Noise FET (Tape-Carrier)
MGF1903	B		
MGF1904	C		
MGF4301A	R	GD-4	Low Noise HEMT
MGF4302A	S		
MGF4303A	M		
MGF4304A	N		
MGF4305A	P		
MGF4401A	J	GD-9	
MGF4402A	K		
MGF4403A	L		
MGF4404A	N		
MGF4405A	P		
MGF4901A	D	GD-7	Low Noise HEMT (Tape-Carrier)
MGF4902A	E		
MGF4903A	F		
MGF3000	A	GD-8	S.B.D.

MITSUBISHI SEMICONDUCTOR <GaAs FET>

SYMBOL ON PACKAGE

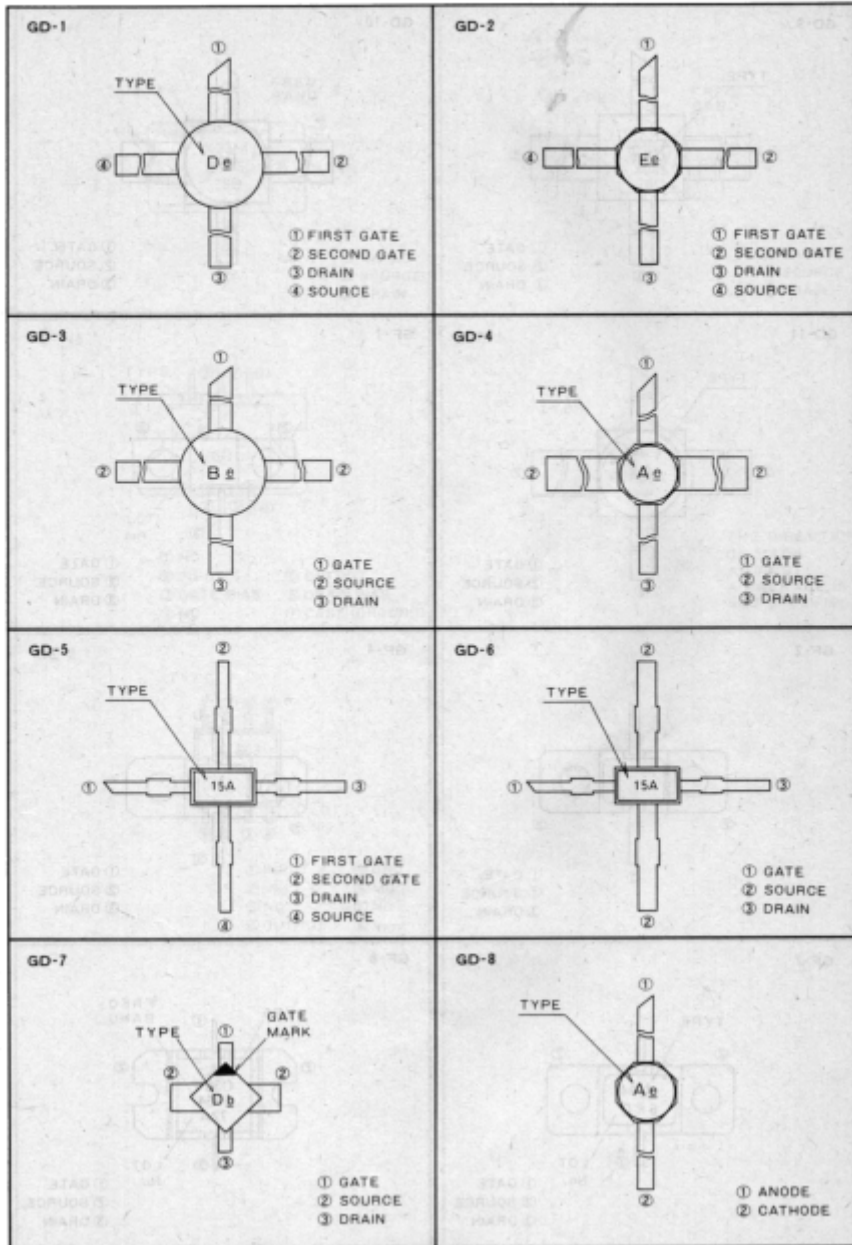
Power GaAs FET

Type	Symbol	Outline	Classification
MGF1601	B	GD-10	Power FET (Micro Disk)
MGF1601	A	GD-11	
MGF1602		GF-1	Power FET (Fringe Type)
MGF2116		GF-2	
MGF2117		GF-1	
MGF2124		GF-4	
MGF2148			
MGF2172			
MGF2407		GF-1	
MGF2415			
MGF2430			
MGF2445		GF-4	
MGF0904	94	GF-7	Power FET (Internally Matched)
MGF0905	95		
MGFC36V SERIES	C36V	GF-8	
MGFC39V SERIES	C39V		
MGFX35V9095	X35V	GF-14	
MGFX38V9095	X38V		
MGFK25M4045	K25M	GF-11	
MGFK30M4045	K30M		
MGFK33M4045	K33M		
MGFK35M4045	K35M	GF-14	
MGFK35V4045	K35V		
MGFK37V4045	K37V		

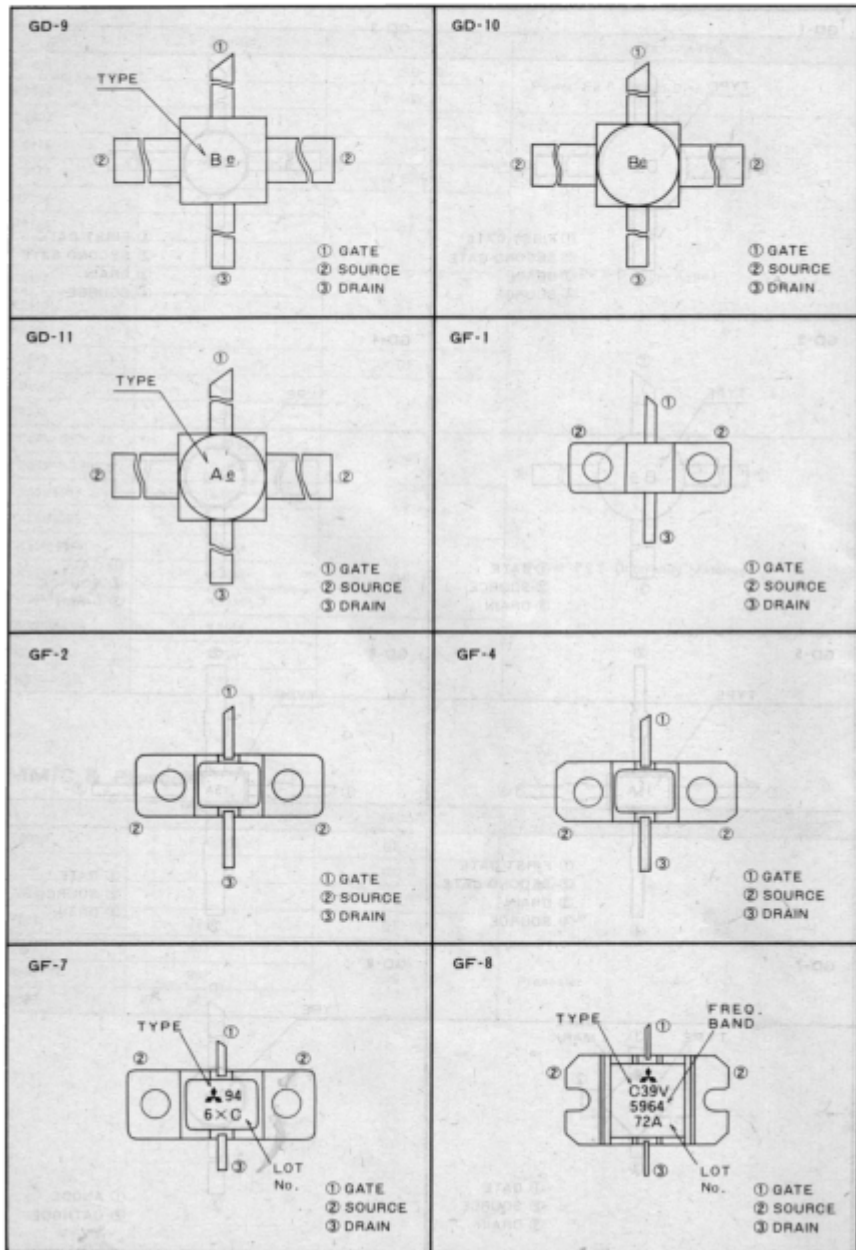
GaAs MMIC & Prescaler

Type	Symbol	Outline	Classification
MGF7002A	F7002A	GE-1	MMIC
MGF7003	F	GD-4	
MGF7004	2	GD-6	
MGF7201	721	GF-15	
MGF8001	801	GE-2	Prescaler
MGF8002	802		
MGF8003	803		

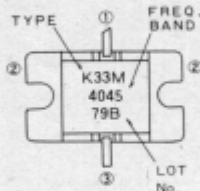
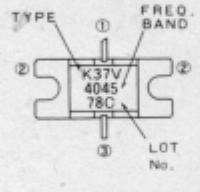
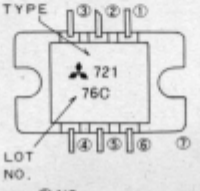
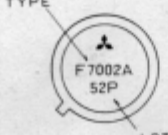
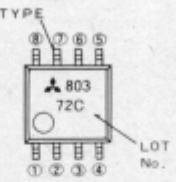
**MITSUBISHI SEMICONDUCTOR <GaAs FET>
SYMBOL ON PACKAGE**



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<p>GF-11</p>  <p>① GATE ② SOURCE ③ DRAIN</p>	<p>GF-14</p>  <p>① GATE ② SOURCE ③ DRAIN</p>
<p>GF-15</p>  <p>① NC ⑤ OUTPUT ② INPUT ⑥ DRAIN BIAS ③ GATE BIAS ⑦ CASE (GROUND) ④ NC</p>	<p>GE-1</p>  <p>THE DIRECTION OF MARK AGAINST A PACKAGE IS NOT SPECIFIED</p>
<p>GE-2</p>  <p>① INPUT ⑤ GND ② V_{DD} ⑥ MOD ③ NC ⑦ NC ④ OUTPUT ⑧ V_{REF}</p>	