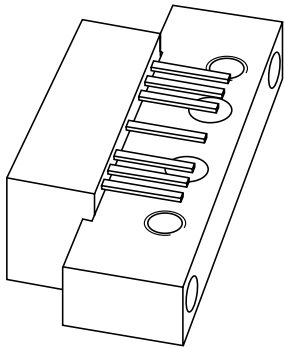


DATA SHEET



CGD914; CGD914MI 860 MHz, 20 dB gain power doubler amplifier

Product specification
Supersedes data of 2000 Jul 25

2001 Nov 01

860 MHz, 20 dB gain power doubler amplifier

CGD914; CGD914MI

FEATURES

- Excellent linearity
- Extremely low noise
- Excellent return loss properties
- Rugged construction
- Gold metallization ensures excellent reliability.

APPLICATIONS

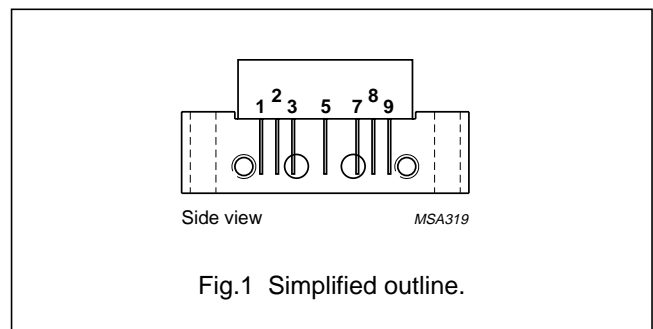
- CATV systems operating in the 40 to 870 MHz frequency range.

DESCRIPTION

Hybrid amplifier module in a SOT115J package operating at a voltage supply of 24 V (DC), employing both GaAs and Si dies. Both modules are electrically identical, only the pinning is different.

PINNING - SOT115J

PIN	DESCRIPTION	
	CGD914	CGD914MI
1	input	output
2 and 3	common	common
5	+V _B	+V _B
7 and 8	common	common
9	output	input



QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
G _p	power gain	f = 45 MHz	19.75	20.25	dB
		f = 870 MHz	20.2	21.5	dB
I _{tot}	total current consumption (DC)	V _B = 24 V	345	375	mA

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 60134).

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V _B	supply voltage	–	30	V
V _i	RF input voltage	–	–	
	single tone	–	70	dBmV
	132 channels flat	–	45	dBmV
T _{stg}	storage temperature	–40	+100	°C
T _{mb}	operating mounting base temperature	–20	+100	°C

860 MHz, 20 dB gain power doubler amplifier

CGD914; CGD914MI

CHARACTERISTICSBandwidth 45 to 870 MHz; $V_B = 24$ V; $T_{mb} = 35$ °C; $Z_S = Z_L = 75$ Ω .

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
G _p	power gain	f = 45 MHz	19.75	20	20.25	dB
		f = 870 MHz	20.2	21	21.5	dB
SL	slope straight line	f = 45 to 870 MHz	0.2	1	1.5	dB
FL	flatness straight line	f = 45 to 100 MHz	-0.25	-	+0.25	dB
		f = 100 to 800 MHz	-0.6	-	+0.4	dB
		f = 800 to 870 MHz	-0.45	-	+0.2	dB
	flatness narrow band	in each 6 MHz segment	-	-	±0.1	dB
S ₁₁	input return losses	f = 40 to 80 MHz	20	-	-	dB
		f = 80 to 160 MHz	20	-	-	dB
		f = 160 to 320 MHz	18	-	-	dB
		f = 320 to 550 MHz	16	-	-	dB
		f = 550 to 650 MHz	15	-	-	dB
		f = 650 to 750 MHz	14	-	-	dB
		f = 750 to 870 MHz	14	-	-	dB
		f = 870 to 914 MHz	10	-	-	dB
S ₂₂	output return losses	f = 40 to 80 MHz	21	-	-	dB
		f = 80 to 160 MHz	21	-	-	dB
		f = 160 to 320 MHz	20	-	-	dB
		f = 320 to 550 MHz	19	-	-	dB
		f = 550 to 650 MHz	18	-	-	dB
		f = 650 to 750 MHz	17	-	-	dB
		f = 750 to 870 MHz	16	-	-	dB
		f = 870 to 914 MHz	14	-	-	dB
S ₂₁	phase response	f = 50 MHz	-45	-	+45	deg
S ₁₂	reverse isolation	RF _{out} to RF _{in}	-	-	22	dB
CTB	composite triple beat	79 chs; f _m = 445.25 MHz; note 1	-	-	-76	dB
		112 chs; f _m = 649.25 MHz; note 2	-	-	-64	dB
		132 chs; f _m = 745.25 MHz; note 3	-	-	-55	dB
		79 chs flat; V _o = 44 dBmV; f _m = 547.25 MHz	-	-	-73	dB
		112 chs flat; V _o = 44 dBmV; f _m = 745.25 MHz	-	-	-64	dB
		132 chs flat; V _o = 44 dBmV; f _m = 745.25 MHz	-	-	-60	dB
X _{mod}	cross modulation	79 chs; f _m = 55.25 MHz; note 1	-	-	-70	dB
		112 chs; f _m = 55.25 MHz; note 2	-	-	-62	dB
		132 chs; f _m = 55.25 MHz; note 3	-	-	-57	dB
		79 chs flat; V _o = 44 dBmV; f _m = 55.25 MHz	-	-	-69	dB
		112 chs flat; V _o = 44 dBmV; f _m = 55.25 MHz	-	-	-65	dB
		132 chs flat; V _o = 44 dBmV; f _m = 55.25 MHz	-	-	-63	dB

860 MHz, 20 dB gain power doubler amplifier

CGD914; CGD914MI

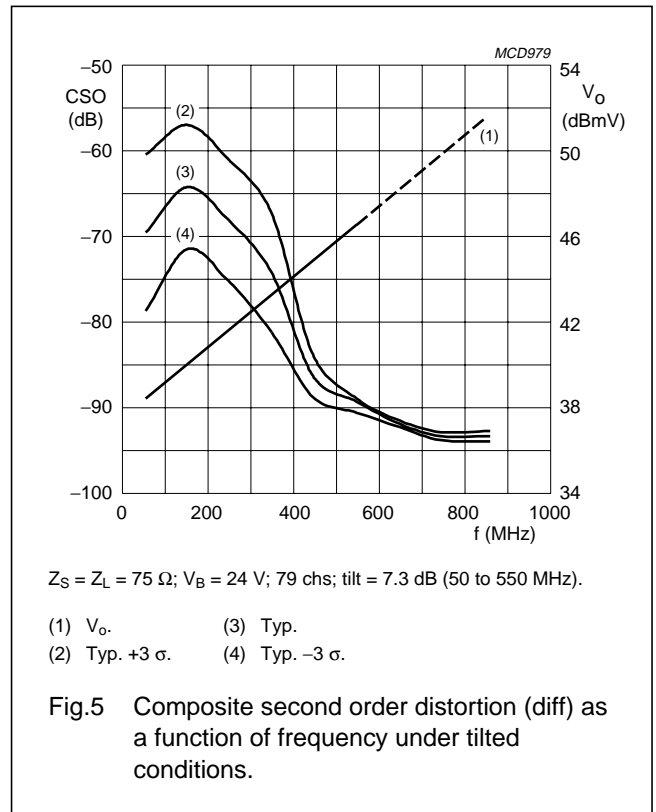
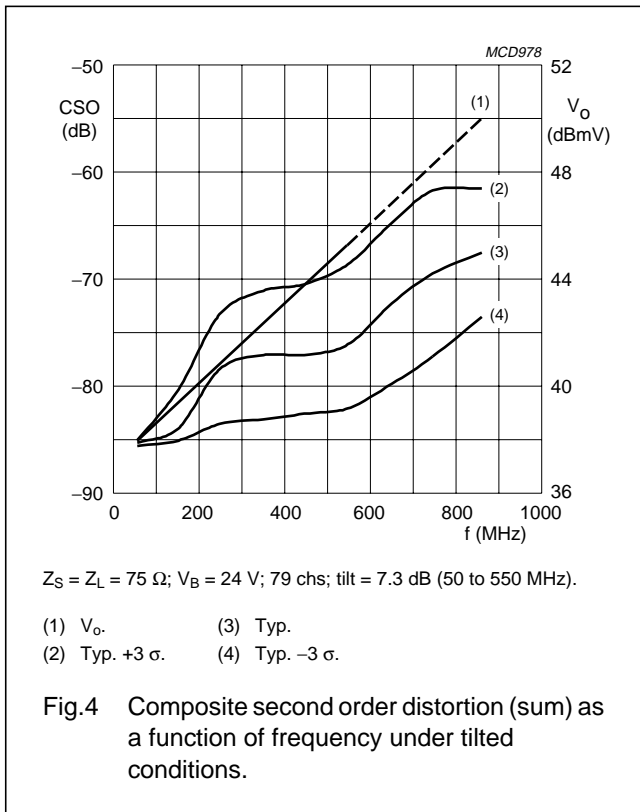
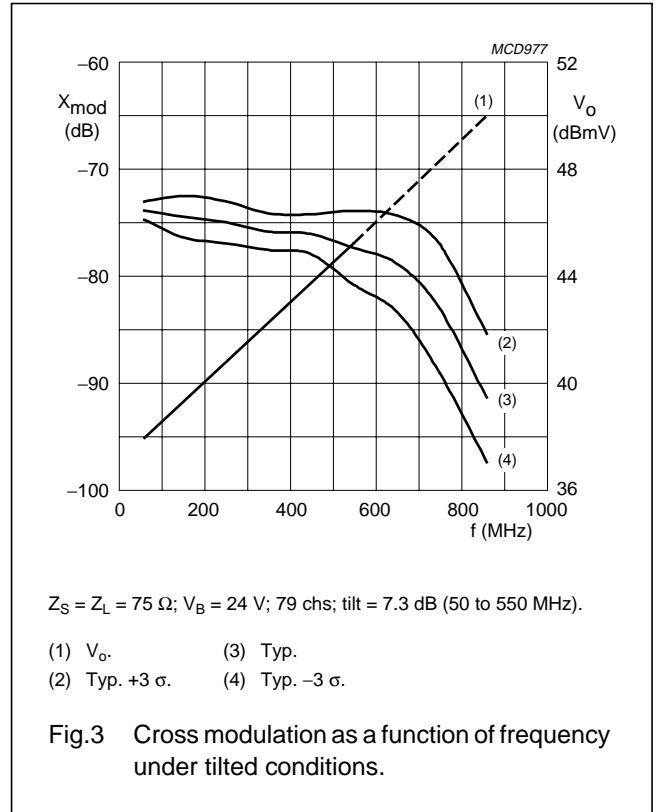
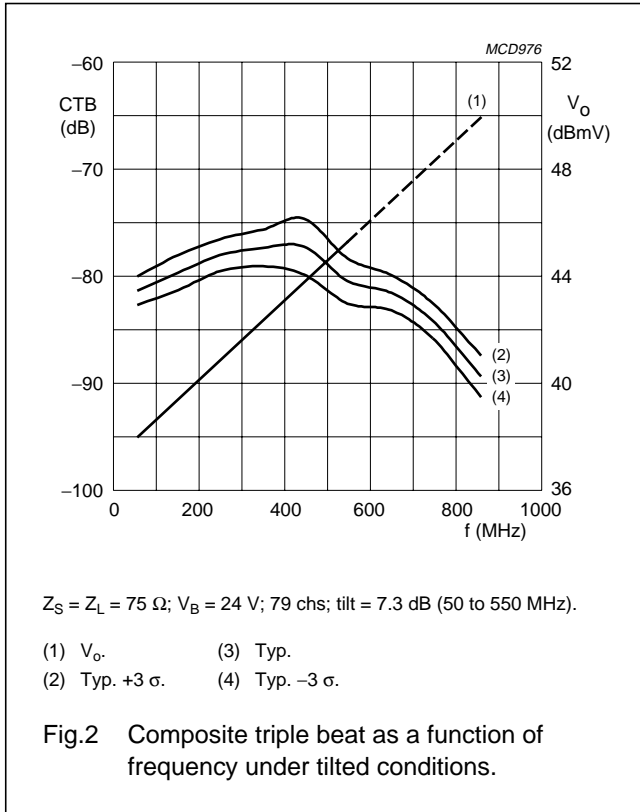
SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
CSO Sum	composite second order distortion (sum)	79 chs; $f_m = 446.5$ MHz; note 1	–	–	–71	dB
		112 chs; $f_m = 746.5$ MHz; note 2	–	–	–60	dB
		132 chs; $f_m = 860.5$ MHz; note 3	–	–	–56	dB
		79 chs flat; $V_o = 44$ dBmV; $f_m = 548.5$ MHz	–	–	–63	dB
		112 chs flat; $V_o = 44$ dBmV; $f_m = 746.5$ MHz	–	–	–54	dB
		132 chs flat; $V_o = 44$ dBmV; $f_m = 860.5$ MHz	–	–	–49	dB
CSO Diff	composite second order distortion (diff)	79 chs; $f_m = 150$ MHz; note 1	–	–	–59	dB
		112 chs; $f_m = 150$ MHz; note 2	–	–	–53	dB
		132 chs; $f_m = 150$ MHz; note 3	–	–	–48	dB
		79 chs flat; $V_o = 44$ dBmV; $f_m = 150$ MHz	–	–	–60	dB
		112 chs flat; $V_o = 44$ dBmV; $f_m = 150$ MHz	–	–	–59	dB
		132 chs flat; $V_o = 44$ dBmV; $f_m = 150$ MHz	–	–	–57	dB
NF	noise figure	$f = 50$ MHz	–	2.5	3	dB
		$f = 550$ MHz	–	2.5	3	dB
		$f = 750$ MHz	–	2.6	3.5	dB
		$f = 870$ MHz	–	3	3.5	dB
d_2	second order distortion	note 4	–	–	–60	dB
		note 5	–	–	–54	dB
		note 6	–	–	–50	dB
V_o	output voltage	$d_{im} = -60$ dB; note 7	69	–	–	dBmV
		$d_{im} = -60$ dB; note 8	66	–	–	dBmV
		$d_{im} = -60$ dB; note 9	63	–	–	dBmV
I_{tot}	total current consumption (DC)	note 10	345	360	375	mA

Notes

- $V_o = 38$ dBmV at 54 MHz; Tilt = 7.3 dB (55 to 547 MHz) extrapolated to 12 dB at 870 MHz.
- $V_o = 38$ dBmV at 54 MHz; Tilt = 10.2 dB (55 to 745 MHz) extrapolated to 12 dB at 870 MHz.
- $V_o = 38$ dBmV at 54 MHz; Tilt = 12 dB (55 to 865 MHz).
- $f_p = 55.25$ MHz; $V_p = 60$ dBmV; $f_q = 493.25$ MHz; $V_q = 60$ dBmV; measured at $f_p + f_q = 548.5$ MHz.
- $f_p = 55.25$ MHz; $V_p = 60$ dBmV; $f_q = 691.25$ MHz; $V_q = 60$ dBmV; measured at $f_p + f_q = 746.5$ MHz.
- $f_p = 55.25$ MHz; $V_p = 60$ dBmV; $f_q = 805.25$ MHz; $V_q = 60$ dBmV; measured at $f_p + f_q = 860.5$ MHz.
- Measured according to DIN45004B: $f_p = 540.25$ MHz; $V_p = V_o$; $f_q = 547.25$ MHz; $V_q = V_o - 6$ dB; $f_r = 549.25$ MHz; $V_r = V_o - 6$ dB; measured at $f_p + f_q - f_r = 538.25$ MHz.
- Measured according to DIN45004B: $f_p = 740.25$ MHz; $V_p = V_o$; $f_q = 747.25$ MHz; $V_q = V_o - 6$ dB; $f_r = 749.25$ MHz; $V_r = V_o - 6$ dB; measured at $f_p + f_q - f_r = 738.25$ MHz.
- Measured according to DIN45004B: $f_p = 851.25$ MHz; $V_p = V_o$; $f_q = 858.25$ MHz; $V_q = V_o - 6$ dB; $f_r = 860.25$ MHz; $V_r = V_o - 6$ dB; measured at $f_p + f_q - f_r = 849.25$ MHz.
- The module normally operates at $V_B = 24$ V, but is able to withstand supply transients up to 30 V.

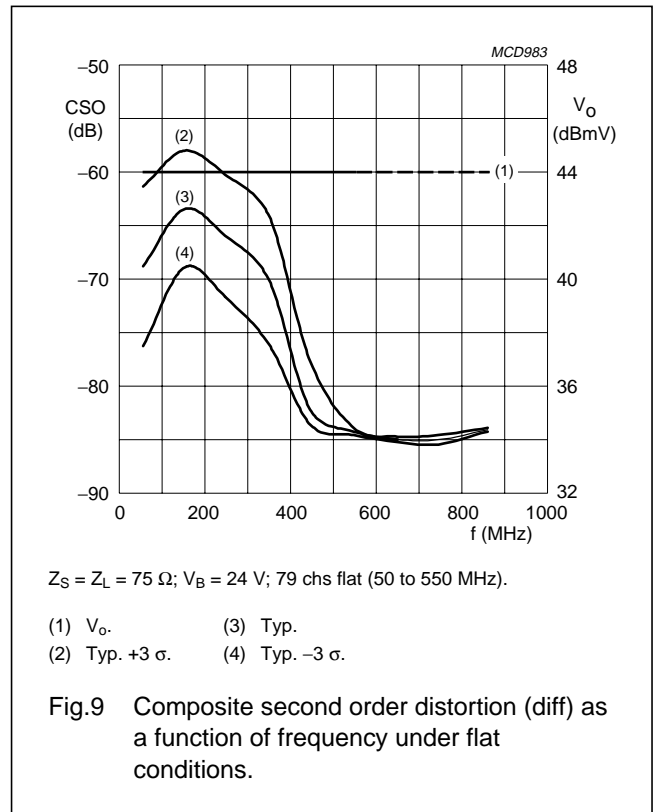
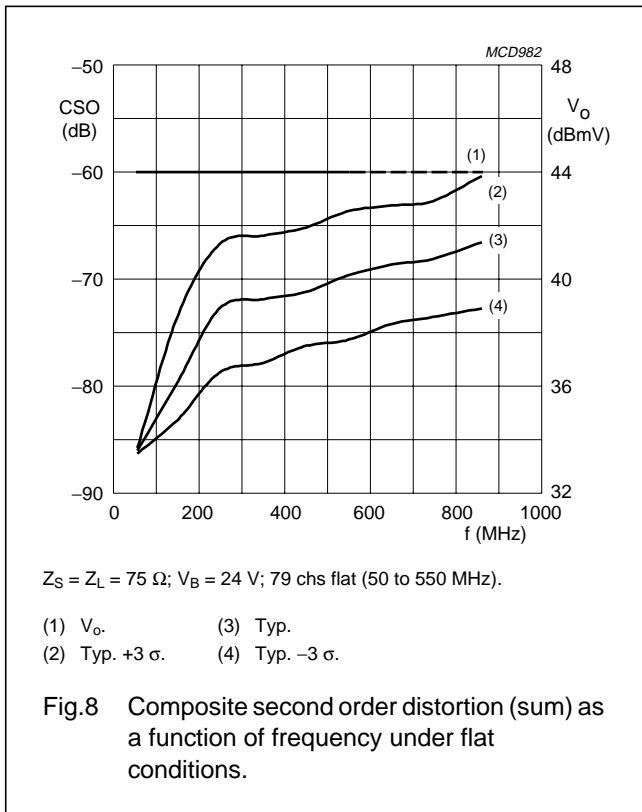
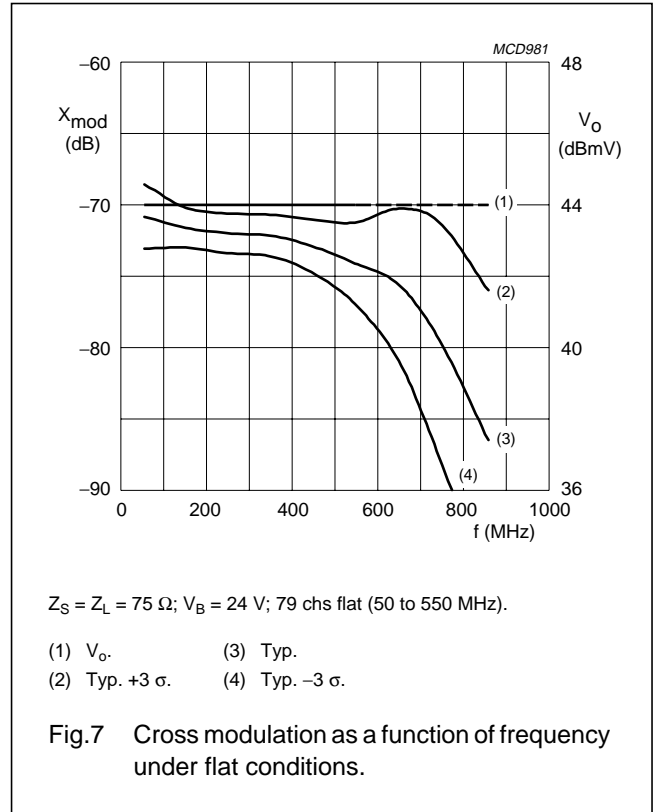
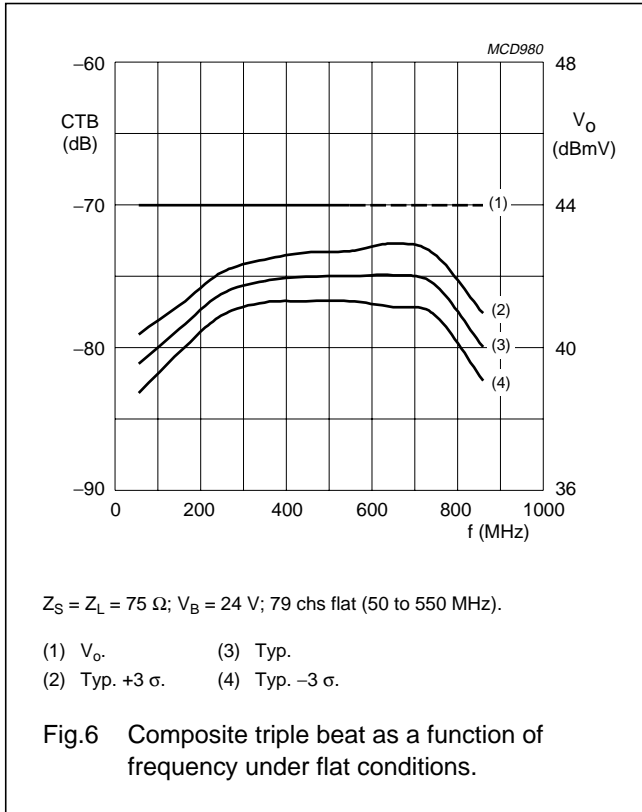
860 MHz, 20 dB gain power doubler amplifier

CGD914; CGD914MI



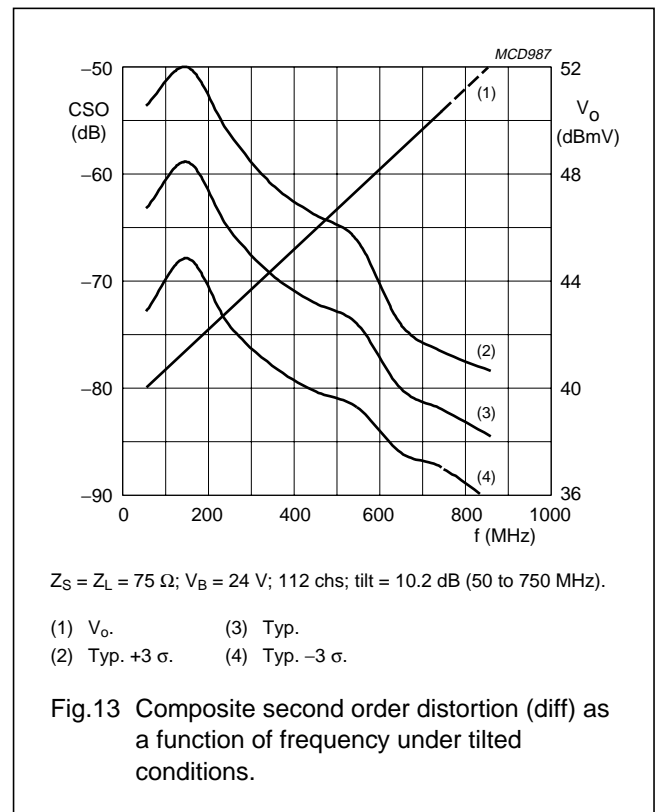
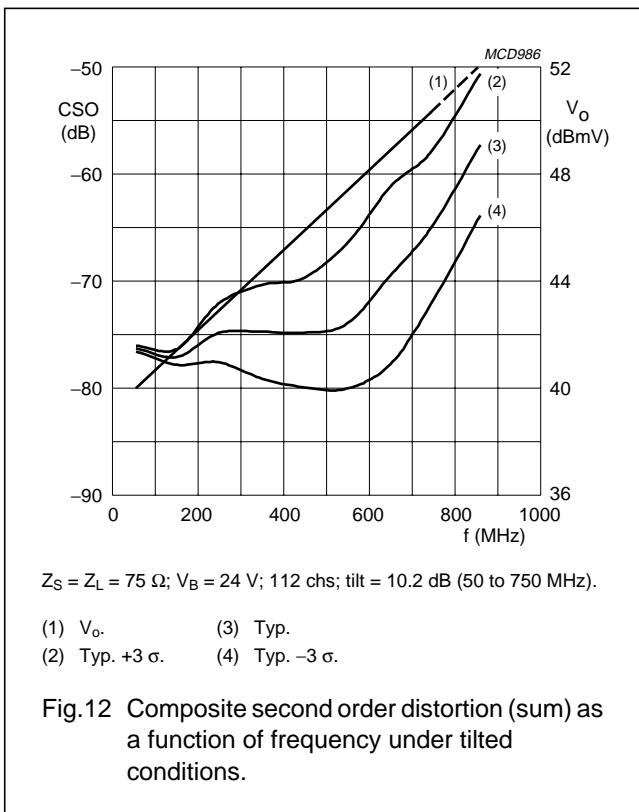
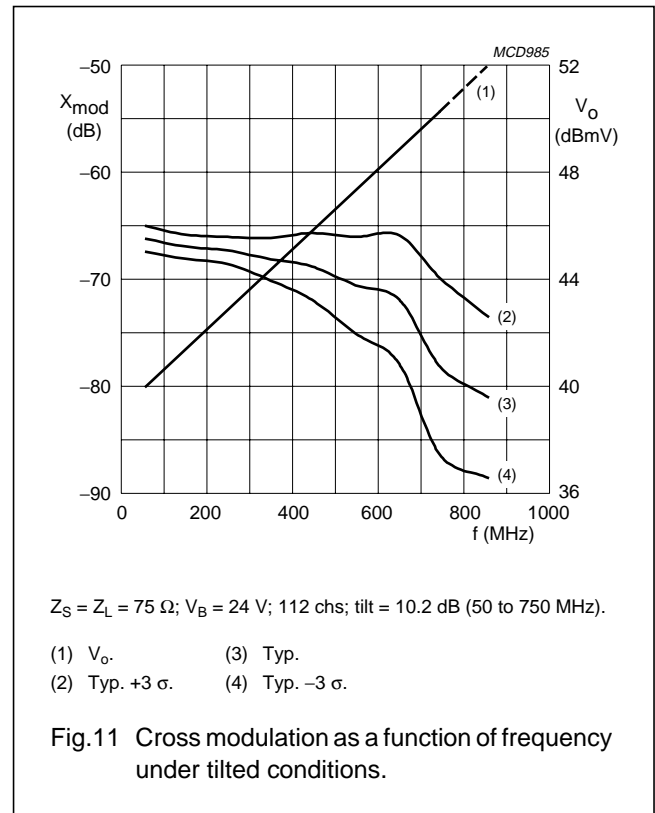
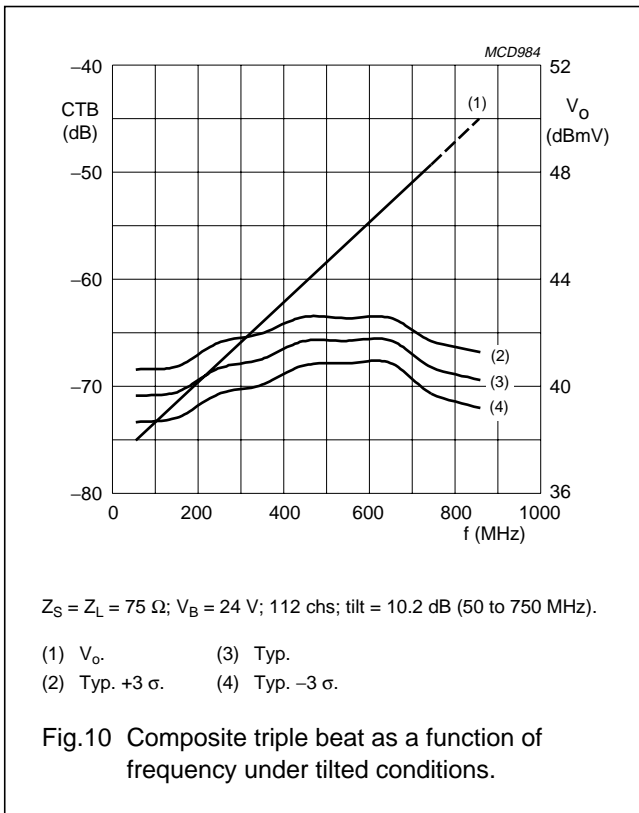
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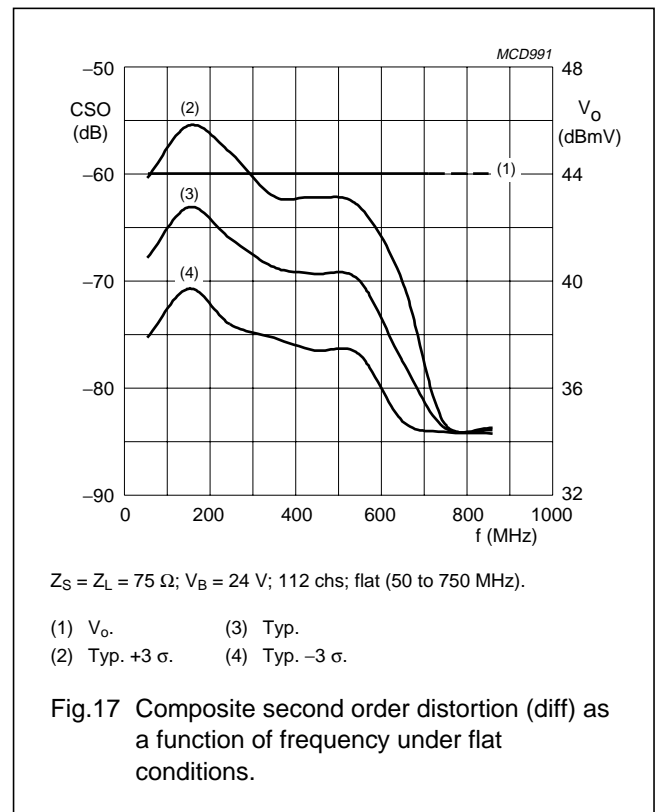
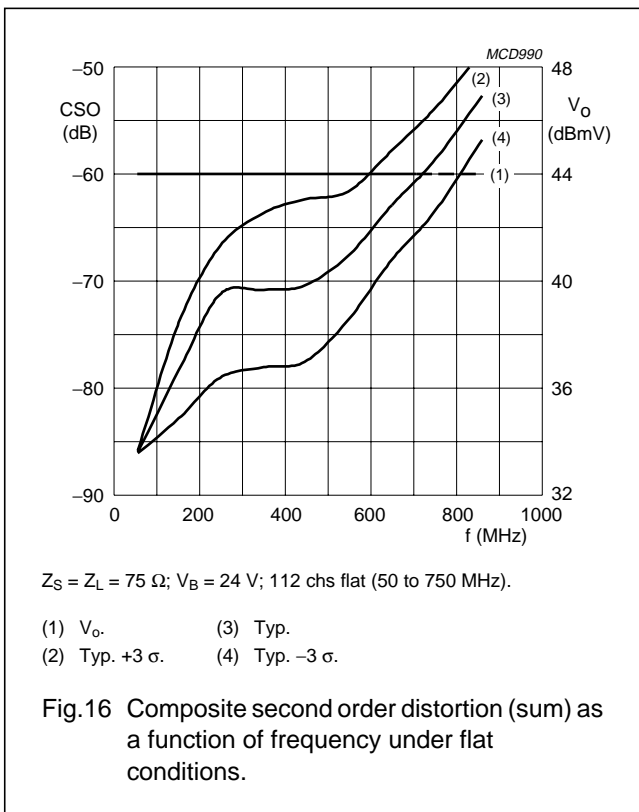
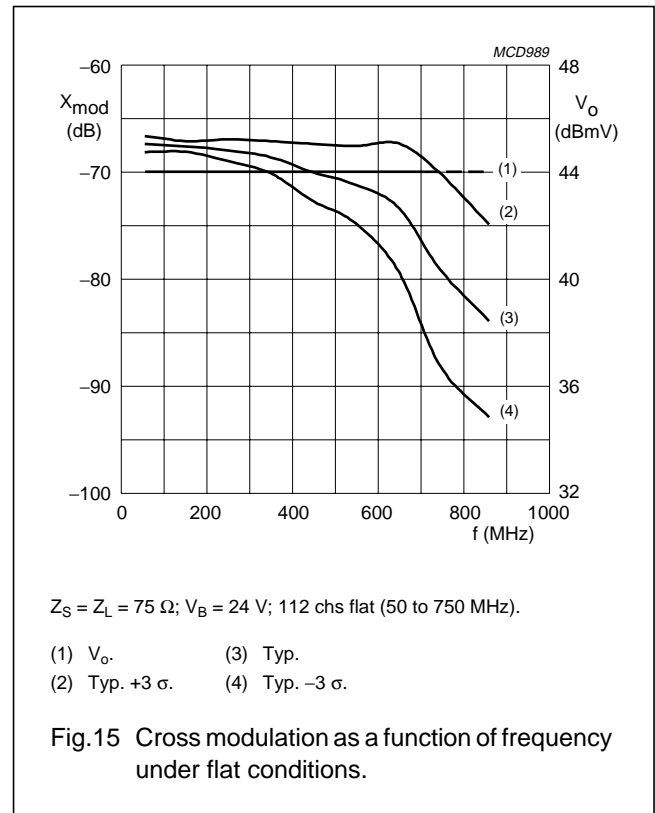
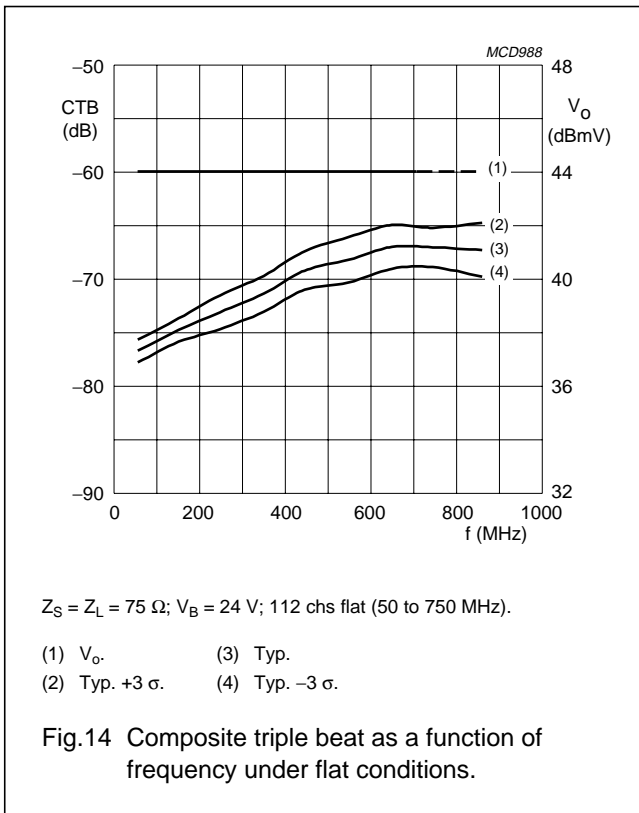
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CGD914; CGD914MI



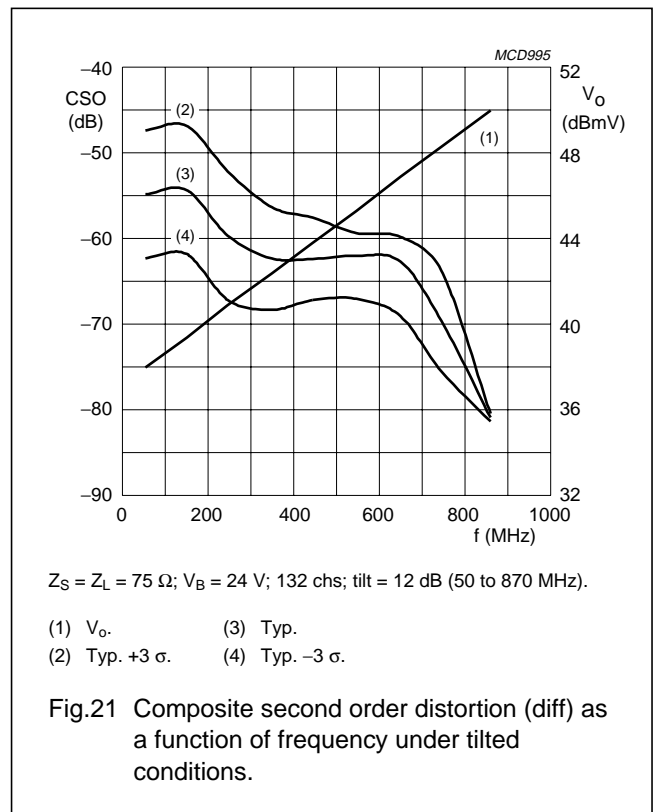
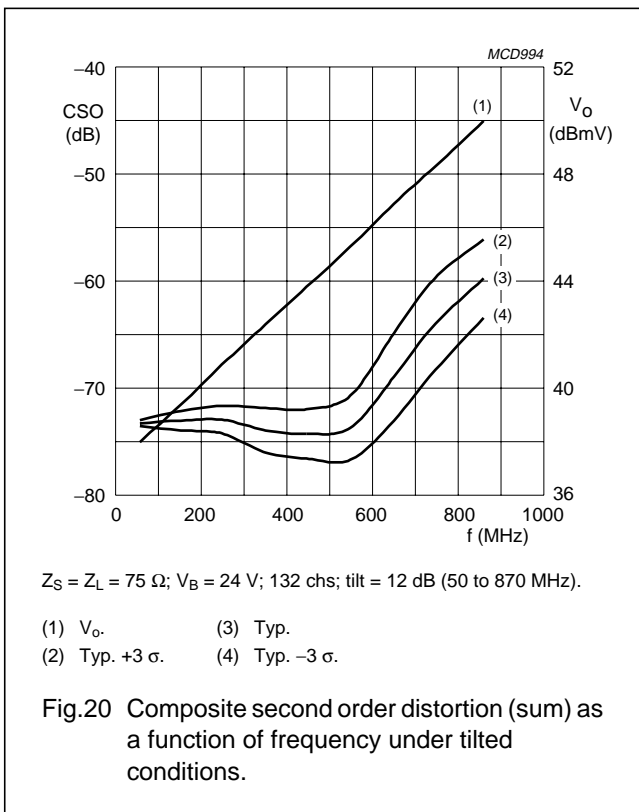
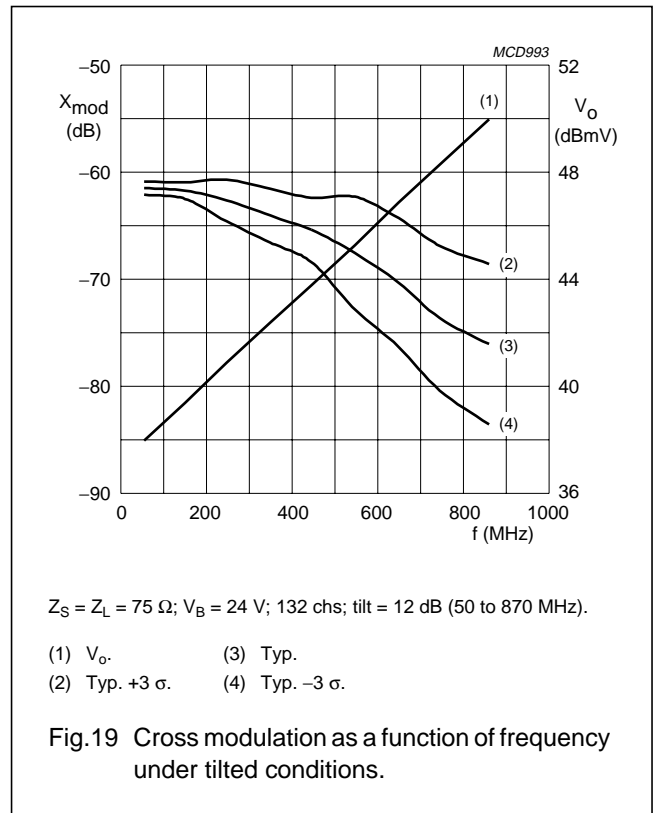
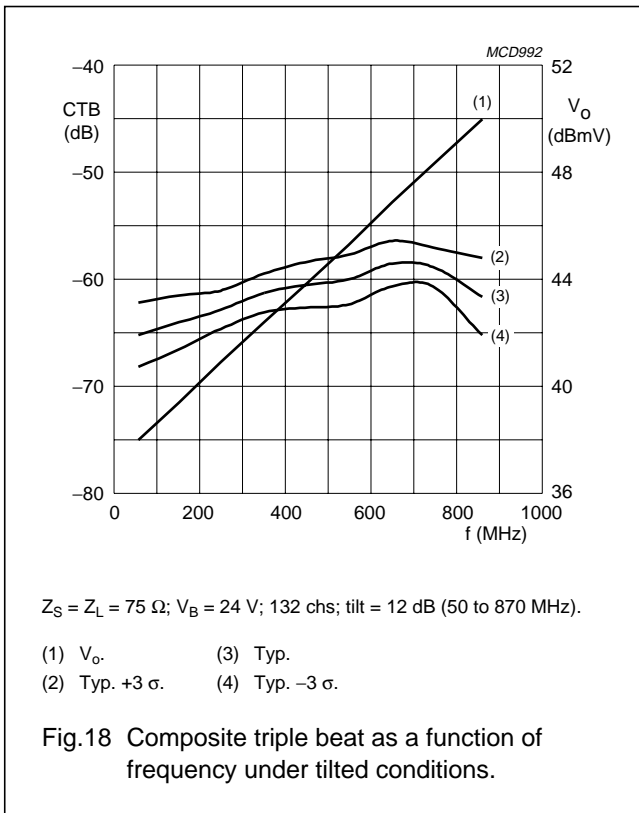
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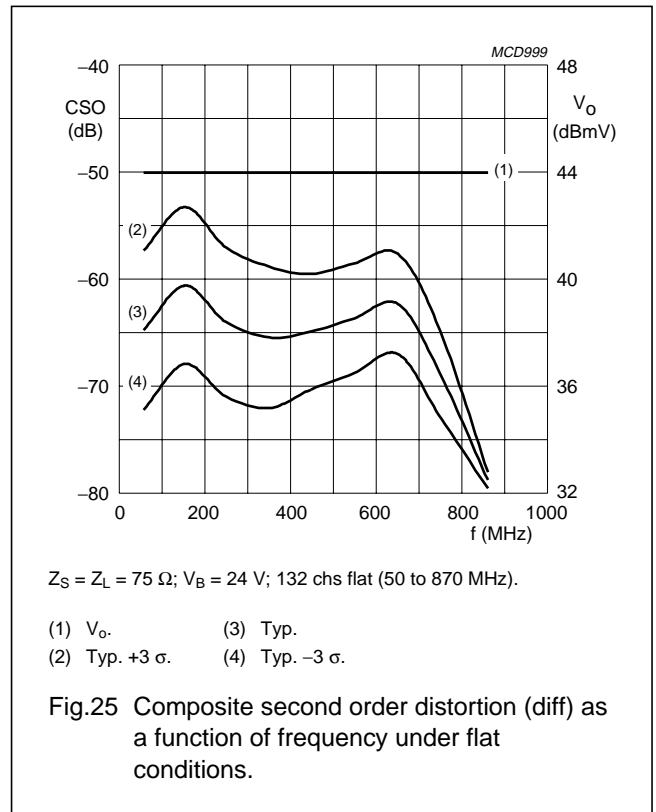
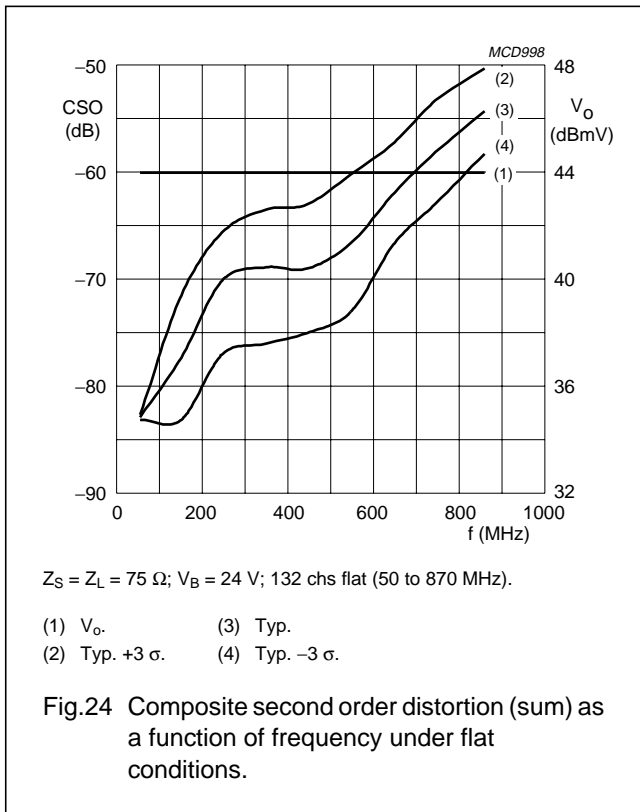
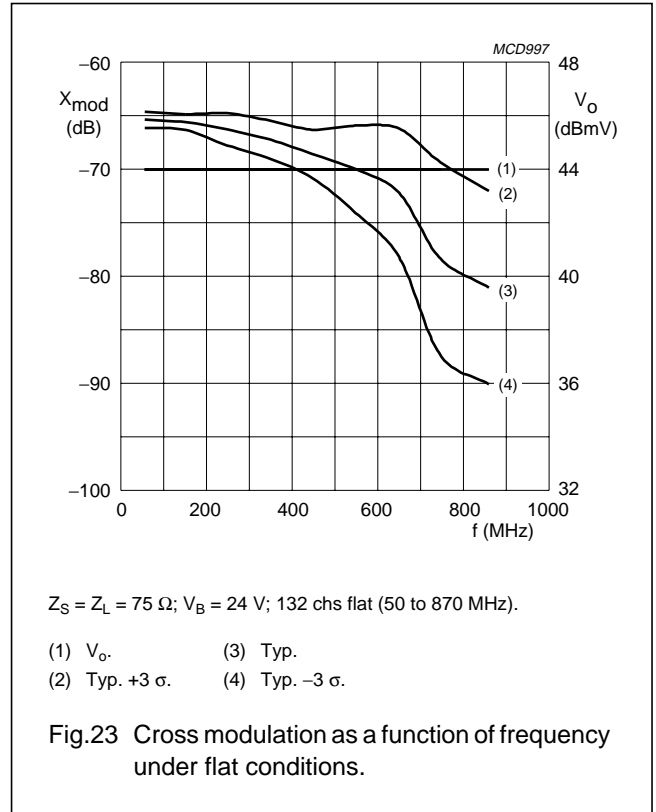
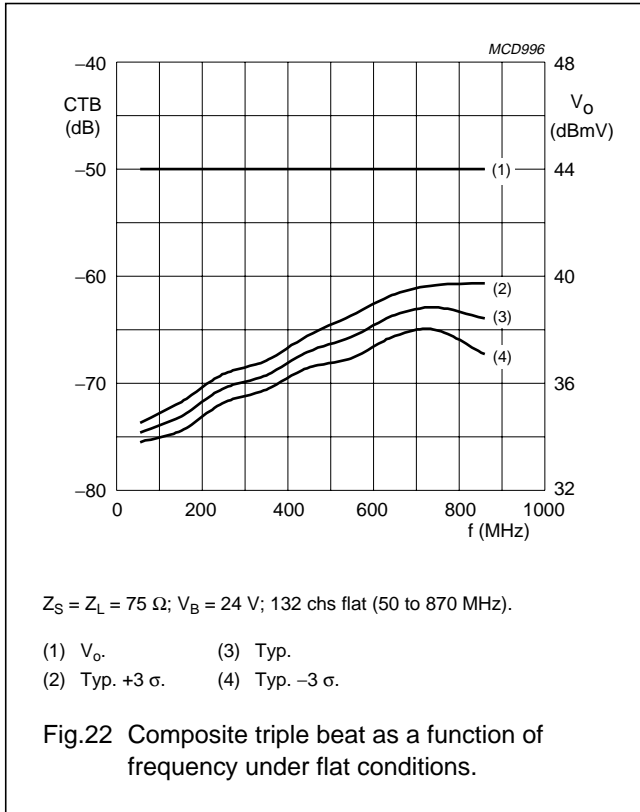
860 MHz, 20 dB gain power doubler amplifier

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860 MHz, 20 dB gain power doubler amplifier

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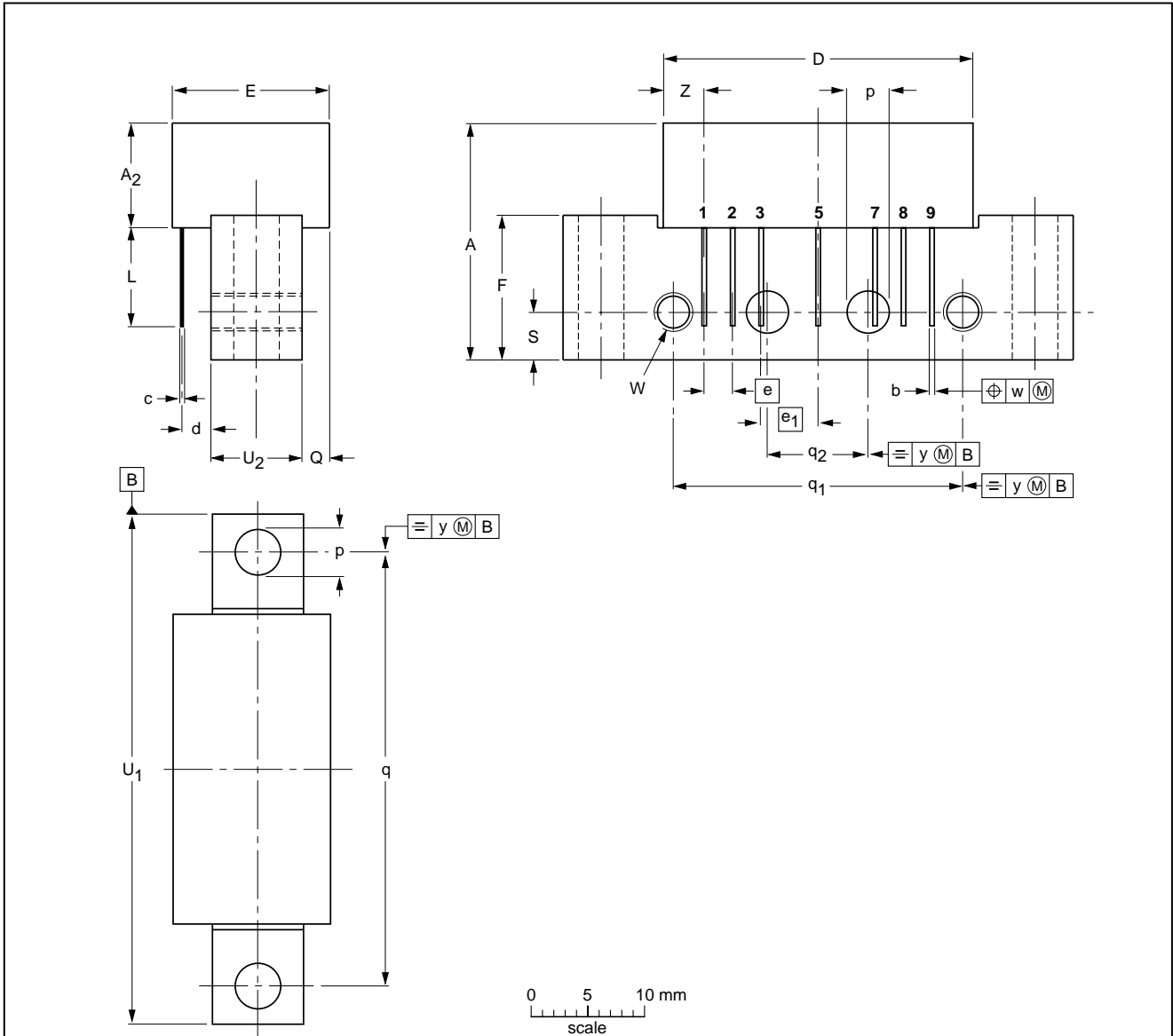
860 MHz, 20 dB gain power doubler amplifier

CGD914; CGD914MI

PACKAGE OUTLINE

Rectangular single-ended package; aluminium flange; 2 vertical mounting holes; 2 x 6-32 UNC and 2 extra horizontal mounting holes; 7 gold-plated in-line leads

SOT115J



DIMENSIONS (mm are the original dimensions)

UNIT	A max.	A ₂ max.	b	c	D max.	d max.	E max.	e	e ₁	F	L min.	p	Q max.	q	q ₁	q ₂	S	U ₁ max.	U ₂	W	w	y	Z max.
mm	20.8	9.1	0.51 0.38	0.25	27.2	2.54	13.75	2.54	5.08	12.7	8.8	4.15 3.85	2.4	38.1	25.4	10.2	4.2	44.75	8	6-32 UNC	0.25	0.1	3.8

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ			
SOT115J						99-02-06

860 MHz, 20 dB gain power doubler amplifier

CGD914; CGD914MI

DATA SHEET STATUS

DATA SHEET STATUS ⁽¹⁾	PRODUCT STATUS ⁽²⁾	DEFINITIONS
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This product is supplied in anti-static packing to prevent damage caused by electrostatic discharge during transport and handling. For further information, refer to Philips specs.: SNW-EQ-608, SNW-FQ-302A, and SNW-FQ-302B.

860 MHz, 20 dB gain power doubler amplifier

CGD914; CGD914MI

NOTES

860 MHz, 20 dB gain power doubler amplifier

CGD914; CGD914MI

NOTES

860 MHz, 20 dB gain power doubler amplifier

CGD914; CGD914MI

NOTES

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