

AH202...AH240

GaAs HYPERABRUPT

TUNING VARACTORS

FEATURES

- Large capacitance change ratio : up to 9.5 : 1
- High Q : min 4000 at f = 50MHz and V=-4 V
- Case style flexibility
- 2 breakdown voltage ranges : 15, 22V

APPLICATIONS

VCO's, filters, phased locked loops by modulating the oscillating frequency.
Usable from VHF to Ka Band.

DESCRIPTION

The tuning varactors operate in junction capacitance variation versus reverse applied voltage. The dependence of junction capacitance C_j is given by :

$$C_j(V) = \frac{k}{\left[1 - \frac{V}{\phi}\right]^\gamma}$$

- ϕ = Built in potential (1.3 for GaAs material)
- V = Applied voltage
- γ = Capacitance voltage slope exponent (gamma) = 1.00 or 1.25
- k = Arbitrary constant

SELECTION CHART

	Ct - 4 (pF) (±20%)	0.7	1.0	1.4	2.2	3.0	4.2	5.8	6.9	9.5
GAMMA	VBR (V) min.	HYPERABRUPT VARACTORS								
1.00	15	AH202	AH203	AH204	AH205	AH206	AH207	AH208	AH209	AH210
1.00	22	AH212	AH213	AH214	AH215	AH216	AH217	AH218	AH219	AH220
1.25	15	AH222	AH223	AH224	AH225	AH226	AH227	AH228	AH229	AH230
1.25	22	AH232	AH233	AH234	AH235	AH236	AH237	AH238	AH239	AH240

ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	MIN.	MAX.	UNIT
Operating temperature	T_{op}	-40	+85	°C
Storage temperature	T_{stg}	-65	+175	°C

ELECTRICAL CHARACTERISTICS

TEST CONDITIONS		$V_R = -4\text{ V}$ $f = 1\text{ MHz}$	$f = 1\text{ MHz}$	$V_R = -4\text{ V}$ $f = 50\text{ MHz}$	$I_R = 10\ \mu\text{A}$	$V_R = -10\text{ V}$	LIMITING CONDITIONS		TEST CONDITION FOR CAPACITANCE RATIO		
CHARACTERISTICS $T_{\text{case}} = +25^\circ\text{C}$		$C_{T-4} \pm 20\%$ (2)	$C_{T-2} / **$ $C_{T(-A)}$	(1) Q-4	V_{BR}	I_R	TEMPERATURES OPERATING STORAGE		A		
TYPES	CASES*	pF	$\pm 12\%$ TYP	MIN.	V MIN.	μA MAX.	°C		V		
GAMMA : 1.00 ± 10 %											
AH202	F27d	0.7	2.8	4000	15	0.1	-40, +85	-65, +175	12		
AH203	F27d	1.0	3.1	4000	15	0.1			12		
AH204	F27d	1.4	3.3	3000	15	0.1			12		
AH205	F27d	2.2	3.5	3000	15	0.1			12		
AH206	F27d	3.0	3.7	2000	15	0.1			12		
AH207	F27d	4.2	3.8	2000	15	0.1			12		
AH208	F27d	5.8	3.9	1500	15	0.1			12		
AH209	F27d	6.9	3.9	1500	15	0.1			12		
AH210	F27d	9.5	3.9	1500	15	0.1			12		
AH212	F27d	0.7	3.6	4000	22	0.1			20		
AH213	F27d	1.0	4.1	4000	22	0.1			20		
AH214	F27d	1.4	4.5	3000	22	0.1			20		
AH215	F27d	2.2	5.1	3000	22	0.1			20		
AH216	F27d	3.0	5.4	2000	22	0.1			20		
AH217	F27d	4.2	5.7	2000	22	0.1			20		
AH218	F27d	5.8	5.7	1500	22	0.1			20		
AH219	F27d	6.9	6.0	1500	22	0.1			20		
AH220	F27d	9.5	6.1	1500	22	0.1			20		
GAMMA : 1.25 ± 10 %											
AH222	F27d	0.7	3.5	4000	15	0.1			-40, +85	-65, +175	12
AH223	F27d	1.0	4.0	4000	15	0.1	12				
AH224	F27d	1.4	4.3	3000	15	0.1	12				
AH225	F27d	2.2	4.8	3000	15	0.1	12				
AH226	F27d	3.0	5.0	2000	15	0.1	12				
AH227	F27d	4.2	5.2	2000	15	0.1	12				
AH228	F27d	5.8	5.4	1500	15	0.1	12				
AH229	F27d	6.9	5.5	1500	15	0.1	12				
AH230	F27d	9.5	5.6	1500	15	0.1	12				
AH232	F27d	0.7	4.6	4000	22	0.1	20				
AH233	F27d	1.0	5.5	4000	22	0.1	20				
AH234	F27d	1.4	6.3	3000	22	0.1	20				
AH235	F27d	2.2	7.3	3000	22	0.1	20				
AH236	F27d	3.0	7.9	2000	22	0.1	20				
AH237	F27d	4.2	8.5	2000	22	0.1	20				
AH238	F27d	5.8	9.0	1500	22	0.1	20				
AH239	F27d	6.9	9.2	1500	22	0.1	20				
AH240	F27d	9.5	9.5	1500	22	0.1	20				

* Other packages or chips form available on request.

** Total capacitance ratios will vary with choice of case style.

(1) Determined on a sample basis

(2) $CT = C_j + C_p$ with $C_p = 0.2\text{ pF}$ for F27d (For other packages, see the values of C_p)

TECHNICAL DATA

TYPICAL PERFORMANCE CURVES

3

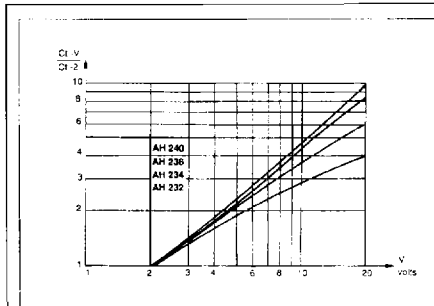


Fig. 3 : TYPICAL $\frac{C1-V}{C1-2}$ RATIO VERSUS REVERSE VOLTAGE

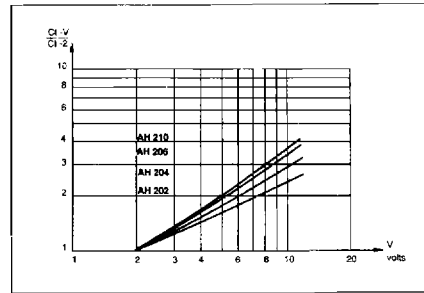


Fig. 2 : TYPICAL $\frac{C1-V}{C1-2}$ RATIO VERSUS REVERSE VOLTAGE

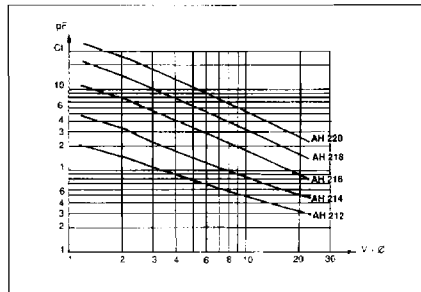


Fig. 5 : TYPICAL CAPACITANCE VERSUS REVERSE VOLTAGE ($\phi = 1.3 V$)

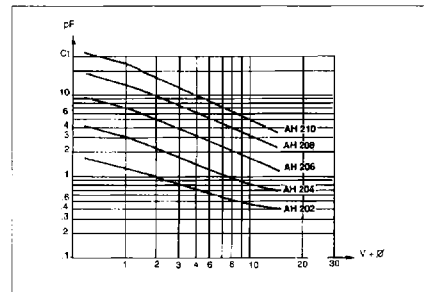


Fig. 4 : TYPICAL CAPACITANCE VERSUS REVERSE VOLTAGE ($\phi = 1.3 V$)

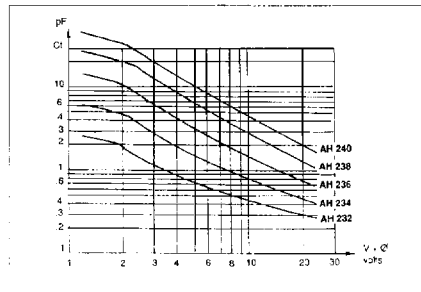


Fig. 7 : TYPICAL CAPACITANCE VERSUS REVERSE VOLTAGE ($\phi = 1.3 V$)

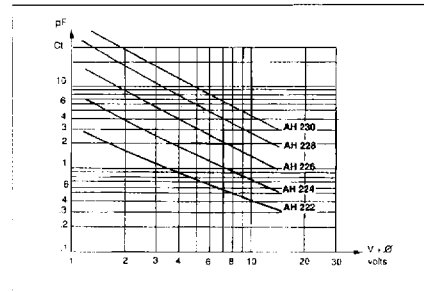
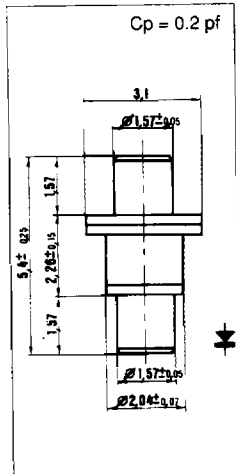


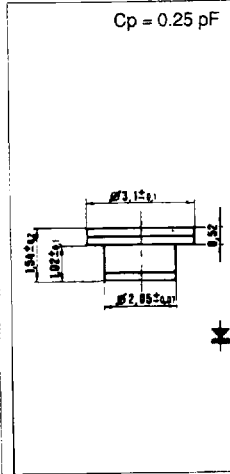
Fig. 6 : TYPICAL CAPACITANCE VERSUS REVERSE VOLTAGE ($\phi = 1.3 V$)

PACKAGES

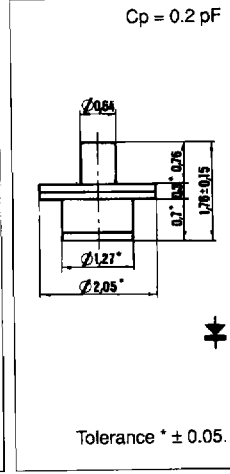
F27d



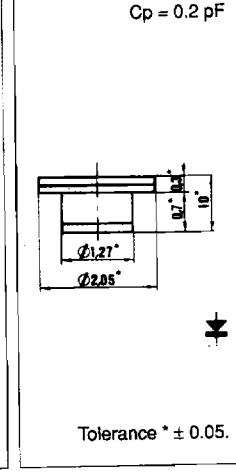
F30



F54



F54s



M208 serie

