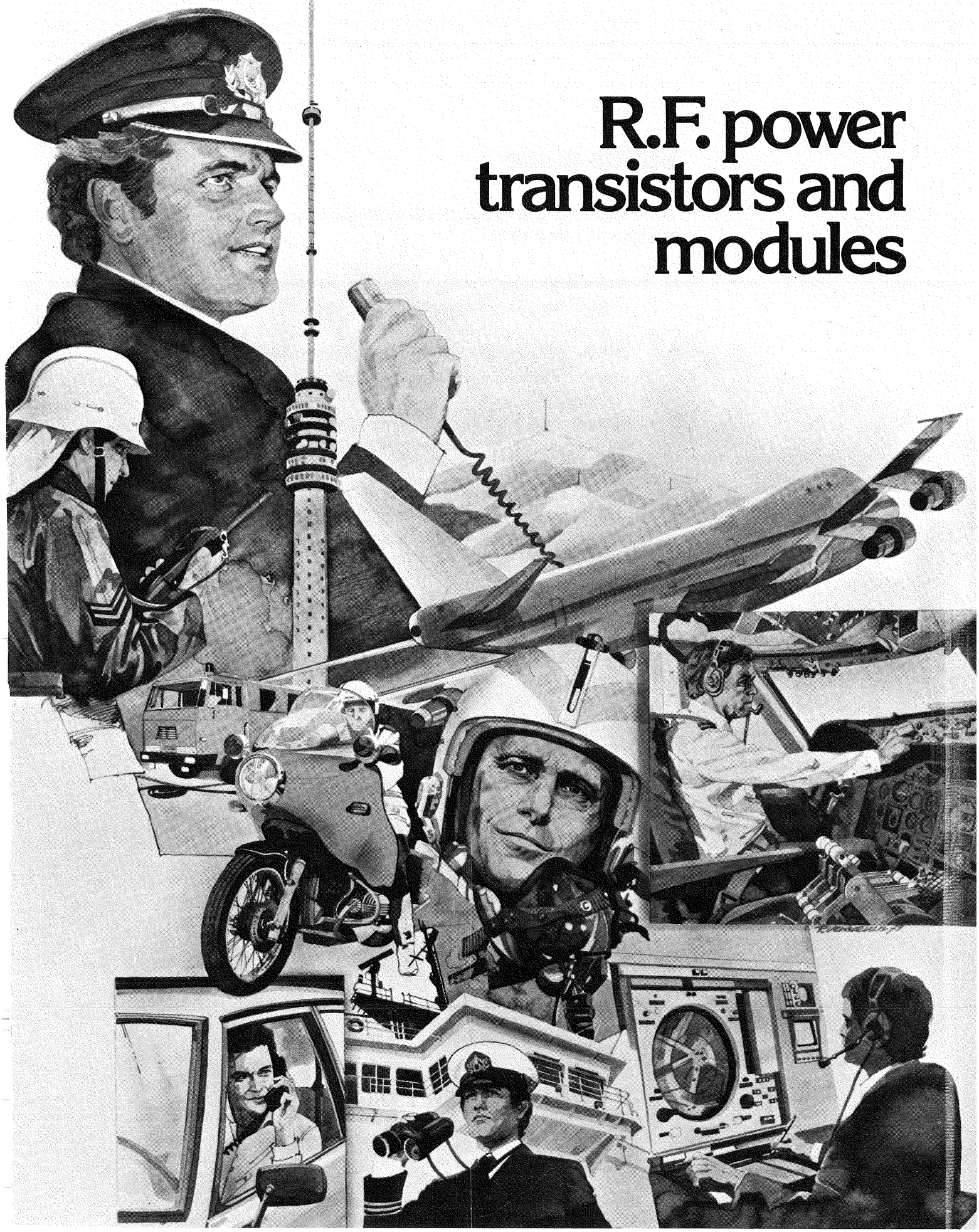
PHILIPS

Electronic components and materials

PHILIPS

R.F. power transistors and modules



status guide

The status code letters used in this catalogue indicate the status of the products at 1 May 1979

N = **New design type.** Recommended for new equipment design; production quantities available *after date of publication.*

D = **Design type.** Recommended for equipment design; production quantities available *after date of publication.*

C = **Current type.** No longer recommended for equipment design; available for equipment production and for use in existing equipment.

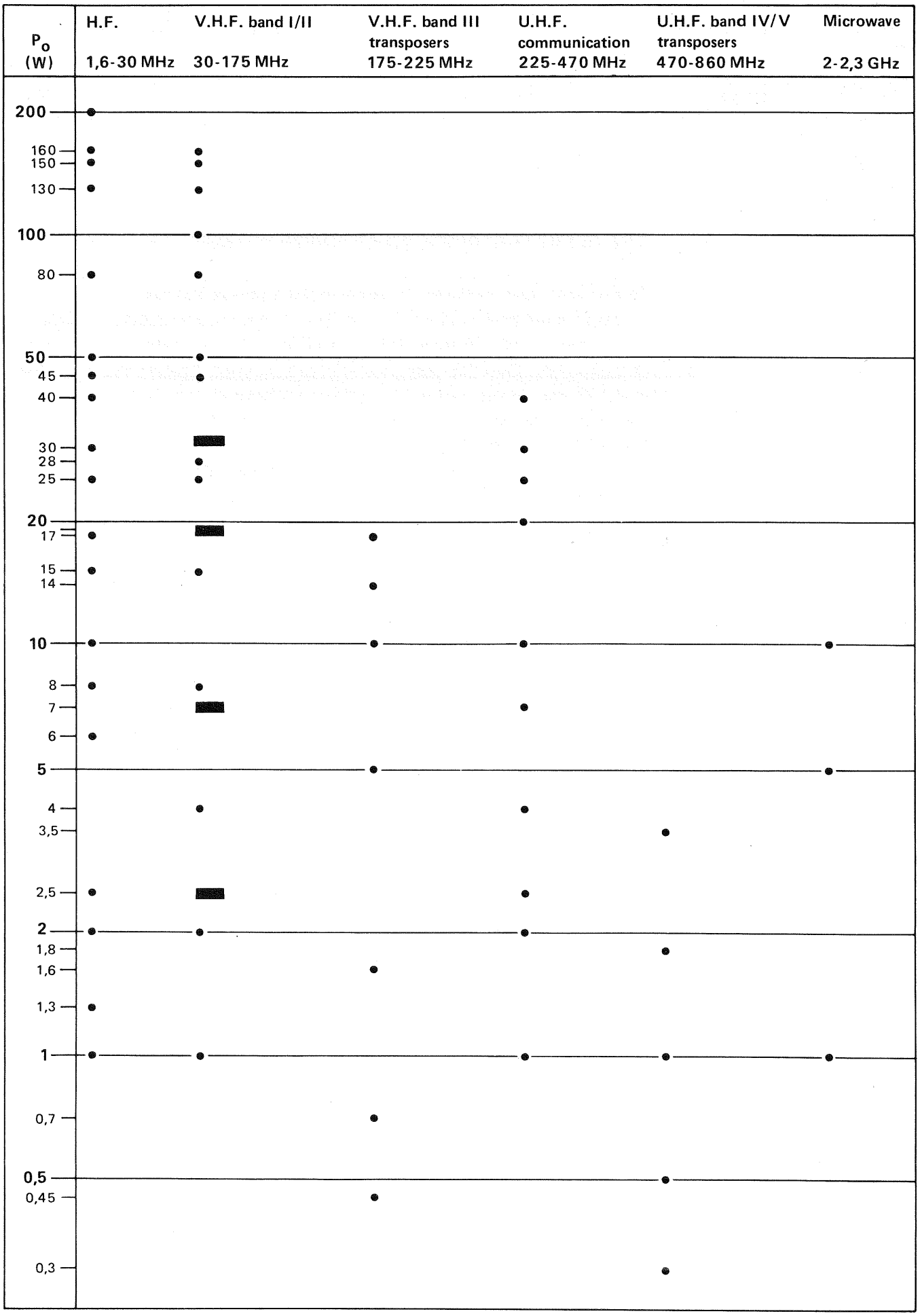
M = **Maintenance type.** No longer recommended for equipment production; available for maintenance of existing equipment.

THE DEFINITIVE GUIDE TO RF POWER TRANSISTORS

Our position as a leader in r.f. power transistors was not easily won.
It owes a great deal to our policy of rigorous testing and quality control at all stages of manufacture. It also demanded a considerable investment in technology. Over the years, we've improved crystal geometry, developed multi-emitter configurations, introduced diffused emitter ballast resistors for uniform current sharing and new metallization techniques to achieve the reliability of gold-to-gold bonding.
The return on that investment has been impressive. We are able to specify our transistors with confidence, back them with all the application support data you need, and then **guarantee** that they will not fail under the most arduous conditions.
In the frequency range from 1,6 MHz to 2,3 GHz we offer nearly 100 types, from low to high power. All details are shown in this catalogue.

We invite you to play the power game. Send for some samples. Their performance will not disappoint you.... we guarantee it.

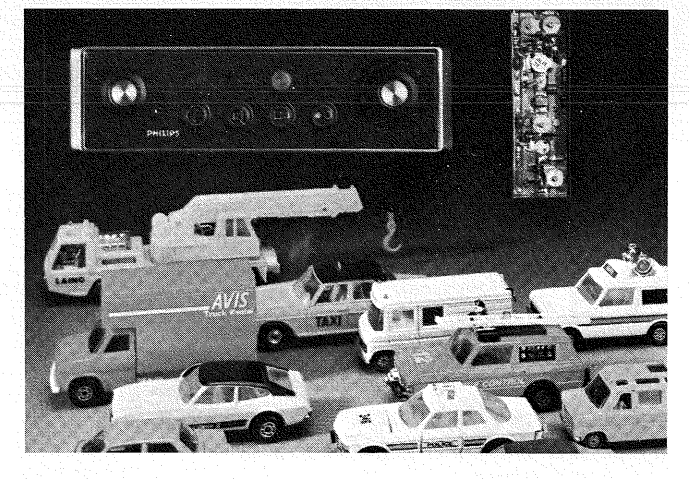
● transistors
▬ modules



Main r.f. power application areas with applicable transistors and modules

	type number	status code	envelope	V_{CE} V	P_L (P.E.P.) W	Gp dB
s.s.b. class-AB; f = 28 MHz; d_3; $d_5 < -30$ dB	**BLY92A**	C	SOT-48(2)		10	20
	BLY92C	D	SOT-120		10	20
	BLV21	D	SOT-123	28	10	20
	BLX13	C	SOT-56		25	18
	BLX13C	D	SOT-120		25	18
	BLW83	D	SOT-123		25	18
	BLX39	D	SOT-120	28	40	17
	BLW86	D	SOT-123		45	17
	BLX14	C	SOT-55		50	13
	BLW76	D	SOT-121A	28	80	13
	BLW77	D	SOT-121B	28	130	12
	BLX15	D	SOT-55	50	150	14
	BLW95	D	SOT-121A	50	160	14
	BLW96	N	SOT-121A	50	200	14
s.s.b. class-A; f = 28 MHz; d_3; $d_5 < -40$ dB	**BLY91A**	C	SOT-48(2)		1,3	
	BLY91C	D	SOT-120	26	1,3	20
	BLV20	D	SOT-123		1,3	
	BLY92A	C	SOT-48(2)		2,5	
	BLY92C	D	SOT-120		2,5	20
	BLV21	D	SOT-123	26	2,5	20
	BLX13	C	SOT-56		8	18
	BLX13C	D	SOT-120		8	20
	BLW83	D	SOT-123		10	20
	BLX39	D	SOT-120	26	15	18
	BLW86	D	SOT-123		17	20
	BLW78	D	SOT-121A		30	18
s.s.b. class-AB; f = 28 MHz; d_3; $d_5 < -30$ dB	**BLY88A**	C	SOT-48(2)			
	BLY88C	D	SOT-120	13,5	10	18
	BLV11	D	SOT-123			
	BLY89A	C	SOT-56			
	BLY89C	D	SOT-120	13,5	15	18
	BLW87	D	SOT-123			
	BLW60	C	SOT-56			
	BLW60C	D	SOT-120	12,5	30	18
	BLW85	D	SOT-123			
s.s.b. class-A; f = 28 MHz; d_3; $d_5 < -40$ dB	**BLY87A**	C	SOT-48(2)			
	BLY87C	D	SOT-120	12	1	18
	BLV10	D	SOT-123			
	BLY88A	C	SOT-48(2)			
	BLY88C	D	SOT-120	12	2	18
	BLV11	D	SOT-123			
	BLY89A	C	SOT-56			
	BLY89C	D	SOT-120	12	6	18
	BLW87	D	SOT-123			

selection guide



	type number	status code	envelope	f MHz	V_{CE} V	P_L W	G_p dB
v.h.f. base stations; class-B operation	**2N3866**	D	TO-39(1)			1	15
	BFS23A	D	TO-39(1)			4	10
	BLY91A	C	SOT-48(2)	175	28	8	12
	BLY91C	D	SOT-120			8	12
	BLV20	D	SOT-123			8	12
	BLY92A	C	SOT-48(2)			15	10
	BLY92C	D	SOT-120			15	10
	BLV21	D	SOT-123	175	28	15	10
	BLY93A	C	SOT-56			25	9
	BLY93C	D	SOT-120			25	9
	BLW84		SOT-123	175		25	9
	BLX39		SOT-120	175		45	7,5
	BLW86	D	SOT-123	175	28	45	7,5
	BLY94		SOT-55	175		50	7
	BLW76		SOT-121A	108		80	8
	BLW78		SOT-121A	150	28	100	6
	BLW77	D	SOT-121B	87,5	28	130	7,5
	BLX15		SOT-55	108	50	150	7,5
	BLW95		SOT-121A	108	50	160	7,0
v.h.f. mobile transmitters; class-B operation	**2N4427**	D	TO-39(1)		12	1	10
	BFQ42	D	TO-39(1)		13,5	2	11
	BFS22A	D	TO-39(1)	175	13,5	4	8
	BFQ43	D	TO-39(3)		13,5	4	12
	BLY87A	C	SOT-48(2)		13,5	8	9
	BLY87C	D	SOT-120			8	12
	BLV10	D	SOT-123			8	9
	BLW29	D	SOT-120	175	13,5	15	10
	BLY88A	C	SOT-48(2)			15	7,5
	BLY88C	D	SOT-120			15	7,5
	BLV11	D	SOT-123			15	7,5
	BLY89A	C	SOT-56			25	6
	BLY89C	D	SOT-120	175	13,5	25	6
	BLW87	D	SOT-123			25	6
	BLW31	D	SOT-120			28	9
	BLW60	C	SOT-56			45	5,5
	BLW60C	D	SOT-120	175	12,5	45	5,5
	BLW85	D	SOT-123			45	5
	BLY90	D	SOT-55			50	5
v.h.f. modules for mobile transmitters	**BGY32**	D	SOT-132	68- 88	12,5	18	22,6
	BGY33	D		80-108	12,5	18	22,6
	BGY35	D		132-156	12,5	18	20,8
	BGY36	D		148-174	12,5	18	20,8
	BGY38	N		156-163	13,5	31	21
u.h.f. modules for mobile transmitters	**BGY22**	D	SOT-75A	380-512	13,5	2,5	17
	BGY22A			420-480	12,5	2,5	17
	BGY23			380-480	13,5	7,0	4,5
	BGY23A			420-480	12,5	7,0	4,5

TV transposer types **BLW32 - BLW33 - BLW34** for application in band IV/V.

- Au-Au metallization for high reliability
- high power gain offering cheaper line-up
- sophisticated ion-implantation technology
- modern encapsulation giving optimum heatsinking
- complete line-up with small-signal driver transistors

	type number + status code		envelope	f MHz	V_{CE} V	P_L W	G_p dB		
u.h.f. base stations class-B operation	**2N3866**	D	TO-39(1)	470	28	1	7		
	BLX91A	D	SOT-48(1)			1	11		
	BLX92A	D	SOT-48(1)			2,5	11		
	BLX93A	D	SOT-48(1)			7	8,5		
	BLX94A	D	SOT-48(2)			25	6		
	BLX95	D	SOT-56			40	4,5		
u.h.f. mobile transmitters class-B operation	**BLX65**	D	TO-39(1)	470	12,5	2	6		
	BLW79	D	SOT-122			2	9		
	BLX66	D	SOT-48(4)			2,5	8,5		
	BLX67	C	SOT-48(1)			2,5	8,5		
	BLW80	D	SOT-122			4	8		
	BLX68	C	SOT-48(1)	470	12,5	7	5		
	BLW81	D	SOT-122		12,5	10	6		
	BLX69A	D	SOT-48(2)		13,5	20	4		
	BLW82	D	SOT-119		12,5	30	5		
				f MHz	V_{CE} V	$P_{o\ sync}$ W	G_p dB	I_C mA	d_{im} dB
TV transmitters; TV transposers band III; class-A operation	**BLX91A**		SOT-48(1)	225	25	0,45	17	75	55
	BLX92A		SOT-48(1)			0,7	17	115	
	BLX93A	D	SOT-48(1)			1,6	15	260	
	BLX94A		SOT-48(2)			5	12	800	
	BLW64		SOT-56			10	10	1600	
	BLW75		SOT-105			14	8	2400	
	BLV33	N	NO–207B	225	25	19	9	3250	
TV transmitters; TV transposers band IV-V; class-A operation	**BFR96**		SOT-37(2)	860	10	0,08	10	50	60
	BFQ34		SOT-122		15	0,3	10	120	
	BLW32	D	SOT-122		25	0,5	12	150	
	BLX96	C	SOT-48(3)		25	0,5	6	250	
	BLW33	D	SOT-122		25	1,0	10	300	
	BLX97	C	SOT-48(3)	860	25	1,0	5,5	500	60
	BLW34	D	SOT-122			1,8	9	600	
	BLX98	C	SOT-48(2)			3,5	5	850	
	BLW98	D	SOT-122			3,5	6,5	850	

	type number	status code	envelope	f GHz	V_{CE} V	P_L W	G_p dB
Microwave transistors	**PKB20010U**	D	FO53	2,0	28	12	6
	PKB23001U	D	FO53	2,3	28	1,5	7
	PKB23005U	D	FO53	2,3	28	8	7,2

line-ups

Recommended circuit line-ups in the main r.f. power application areas. A comprehensive range of output power levels is indicated together with our recommended types in the particular line-up configuration. The necessary input power level for each line-up is indicated in the first column. More detailed application information as well as computer aided design parameters are available on request.

S.S.B. transmitters (1,5 to 30 MHz)

input power mW	1st stage		2nd stage		3rd stage	P_L (P.E.P.) W	V_{CE} V	stud S flange F
30	BLY87C	*	2 x BLY89C			**30**		S
30	BLV10	*	2 x BLW87			**30**		F
50	BLY88C	*	2 x BLW60C			**50**	13	S
50	BLV11	*	2 x BLW85			**50**		F
100	BLY89C	*	4 x BLW60C			**100**		S
100	BLW87	*	4 x BLW85			**100**		F
50	BLY91C	*	2 x BLX13C			**50**		S
50	BLV20	*	2 x BLW83			**50**		F
150	BLW83	*	2 x BLW76			**150**	28	F
250	2 x BLW83	*	2 x BLW77			**250**		F
500	2 x BLW86	*	4 x BLW77			**450**		F
300	2 x BLX13C	**	2 x BLX15			**300**		S
300	2 x BLW83	**	2 x BLW95			**300**		F
600	2 x BLX39	**	4 x BLX15			**550**	50	S
600	2 x BLW86	**	4 x BLW95			**550**		F
40	BLY91C	**	2 x BLW78	**	8 x BLX15	**1000**		S/F
40	BLV20	**	2 x BLW78	**	8 x BLW95	**1000**		F

Military communication transmitters (25 to 80 MHz)

input power mW	1st stage		2nd stage	3rd stage	P_L W	V_{CE} V	stud S flange F
30	2N4427	*	2 x BLY87C		**15**		S
30	2N4427	*	2 x BLV10		**15**		F
60	BLY87C	*	2 x BLY88C		**25**	13	S
60	BLV10	*	2 x BLV10		**25**		F
100	BLY87C		2 x BLY89C		**50**		S
100	BLV10		2 x BLW87		**50**		F
50	BLY91C		2 x BLX13C		**60**		S
50	BLV20		2 x BLW83		**60**		F
100	BLY91C		2 x BLX39		**90**	28	S
100	BLV20		2 x BLW86		**90**		F
15	BLV20	*	2 x BLV20	2 x BLW78	**200**		F
25	BLV20	*	2 x BLW83	2 x BLW77	**250**		F

* Class-A operation.
** 28 V supply voltage; class-A operation.

Mobile transmitters (68 to 87,5 MHz)

input power mW	1st stage	2nd stage	3rd stage	P_L W	V_{CE} V	stud S flange F
20	2N4427	BLY87C		**8**		S
20	2N4427	BLV10		**8**		F
35	2N4427	BLW29		**14**		S
10	BSX19	BGY32		**18**	13	F
70	BFQ42	BLW31		**28**		S
160	BFQ43	BLW60C		**45**		S
160	BFQ43	BLW85		**45**		F

Base stations (68 to 87,5 MHz)

input power mW	1st stage	2nd stage	3rd stage	P_L W	V_{CE} V	stud S flange F
65	BFS23A	BLY93C		**25**	28	S
65	BFS23A	BLW84		**25**	28	F
125	BLX92A	BLX39		**50**	28	S
15	2N3866	BLV21	BLW78	**100**	28	F
50	2N3866 **	BLY93C **	BLX15	**150**	50	S
50	2N3866 **	BLW84 **	BLW95	**150**	50	F

F.M. broadcast transmitters (87,5 to 108 MHz)

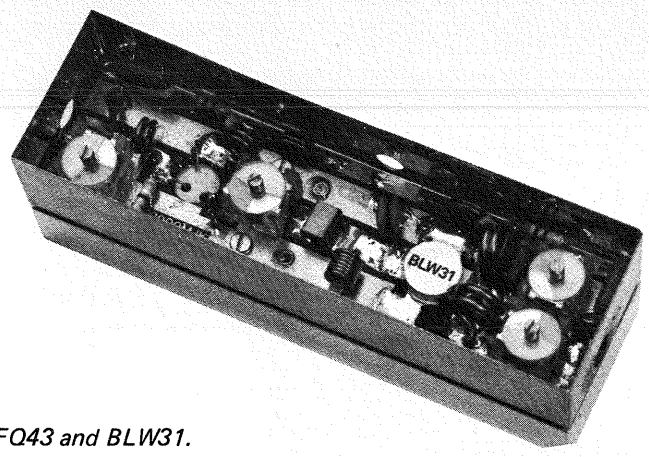
input power mW	1st stage	2nd stage	3rd stage	P_L W	V_{CE} V	stud S flange F
100	BGY33	2 x BLW85		**80**	13	F
140	BLX92A	BLX39		**50**	28	S
40	2N3866	BLV21	BLW78	**100**	28	F
75	BLX92A **	BLX39 **	BLX15	**150**	50	S
75	BLX92A **	BLW86 **	BLW95	**150**	50	S/F
140	BLX92A **	BLX39 **	2 x BLX15	**250**	50	S
140	BLX92A **	BLW86 **	2 x BLW95	**250**	50	S/F

A.M. aircraft transmitters (118 to 136 MHz)

input power mW	1st stage	2nd stage	3rd stage	$P_{L(carr)}$ W	V_{CE} V	stud S flange F
110	BLX92A	BLY93C		**6**		S
240	BLY91C	BLX39		**12**		S
240	BLV20	BLW86		**12**	13/28	F
100	BLX92A	BLY93C	BLW78	**25**		S/F
100	BLX92A	BLW84	BLW78	**25**		S/F

** 28 V supply voltage.

line-ups



V.H.F. power amplifier with BFQ43 and BLW31.

Portable and mobile transmitters (132 to 174 MHz)

input power mW	1st stage	2nd stage	3rd stage	P_L W	V_{CE} V	stud S flange F
40	2N4427	BFQ43		**2**	7,5	–
100	2N4427	BLY87C		**8**	13	S
100	2N4427	BLV10		**8**	13	F
125	BFQ42	BLW29		**14**	13	S
150	BGY36			**18**	13	F
250	BFQ43	BLW31		**28**	13	S
120	BFQ42	BLW29	BLW60C	**45**	13	S
150	BGY36	BLW85		**45**	13	F

Base stations (132 to 174 MHz)

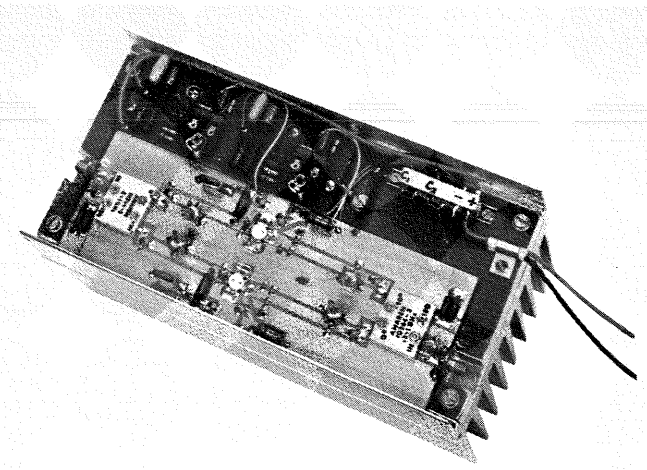
input power mW	1st stage	2nd stage	3rd stage	P_L W	V_{CE} V	stud S flange F
200	BLY91C	BLY93C		**25**		S
200	BLV20	BLW84		**25**		F
25	2N3866	BLY91C	BLX39	**50**	28	S
25	2N3866	BLV20	BLW86	**50**		F
200	BFS23A	BLY93C	2 x BLX39	**100**		S
200	BFS23A	BLW84	2 x BLW86	**100**		F

TV transmitters and transposers (Band III: 174 to 230 MHz)

input power mW	1st stage	2nd stage	3rd stage	4th stage	$P_{o\ sync}$ W	V_{CE} V	stud S flange F
15	BLX93A	BLW64	2 x BLW75		**25**		
60	BLX94A	BLW75	4 x BLW75		**50**	25	S
10	BLX93A	BLW64	2 x BLW75	8 x BLW75	**100**		

Portable and mobile transmitters (400 to 470 MHz)

input power mW	1st stage	2nd stage	3rd stage	4th stage	P_L W	V_{CE} V	stud S flange F
15	BFR96	BLW79	BLW80		**2**	7,5	S
50	BLW79	BLW80	BLW81		**10**	13	S
220	BLW79	BLW81	BLX69A		**18**	13	S
50	BLW79	BLW80	BLW81	BLW82	**30**	13	S/F



TV transposer wide-band amplifier with 2 x BLW98.

Base stations (400 to 470 MHz)

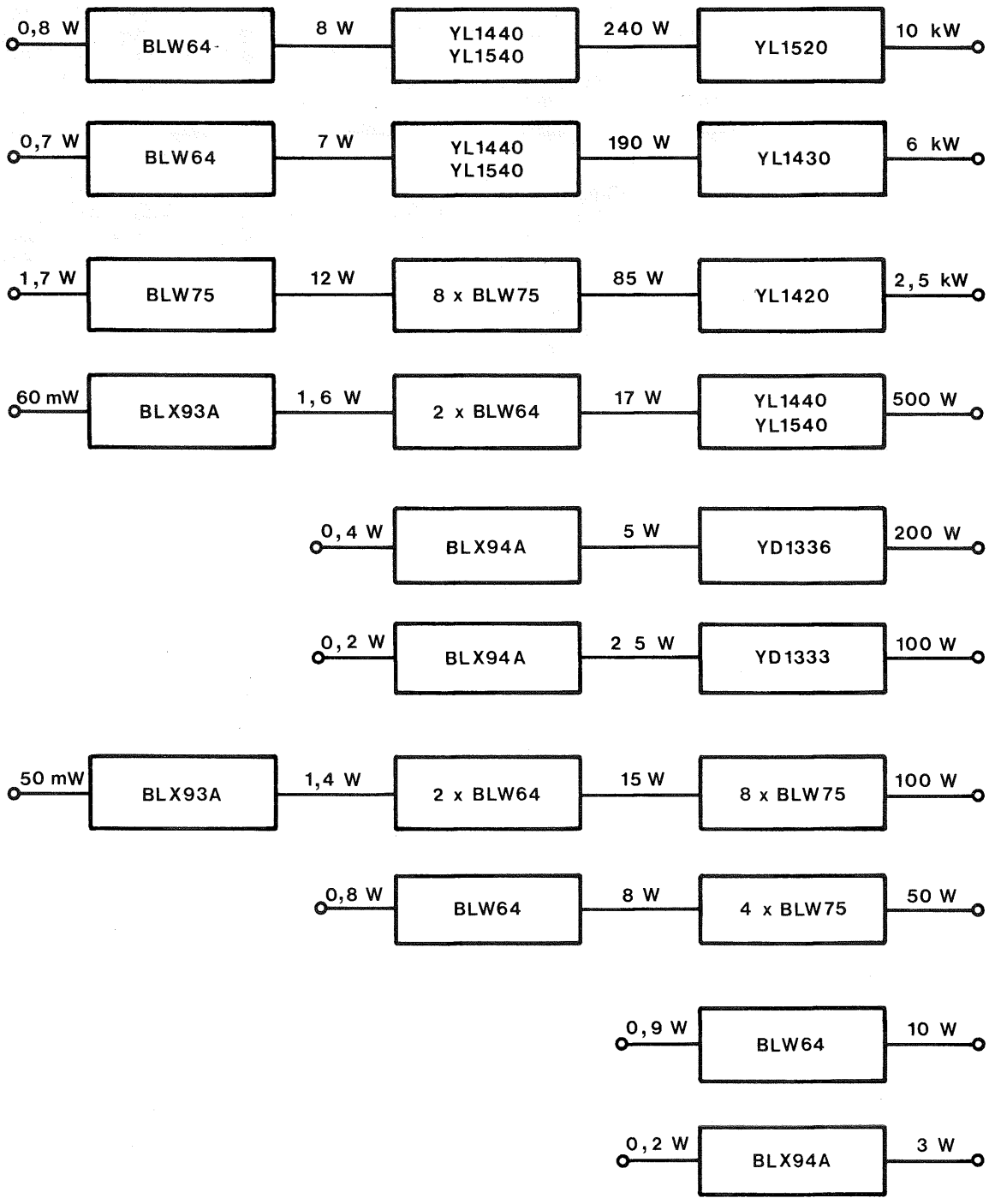
input power mW	1st stage	2nd stage	3rd stage	4th stage	P_L W	V_{CE} V	stud S flange F
70	BLX91A	BLX93A	BLX94A		**25**	28	S
70	BLX91A	BLX93A	BLX94A	2 x BLX95	**72**		

TV transmitters and transposers (Band IV/V: 470 to 860 MHz)

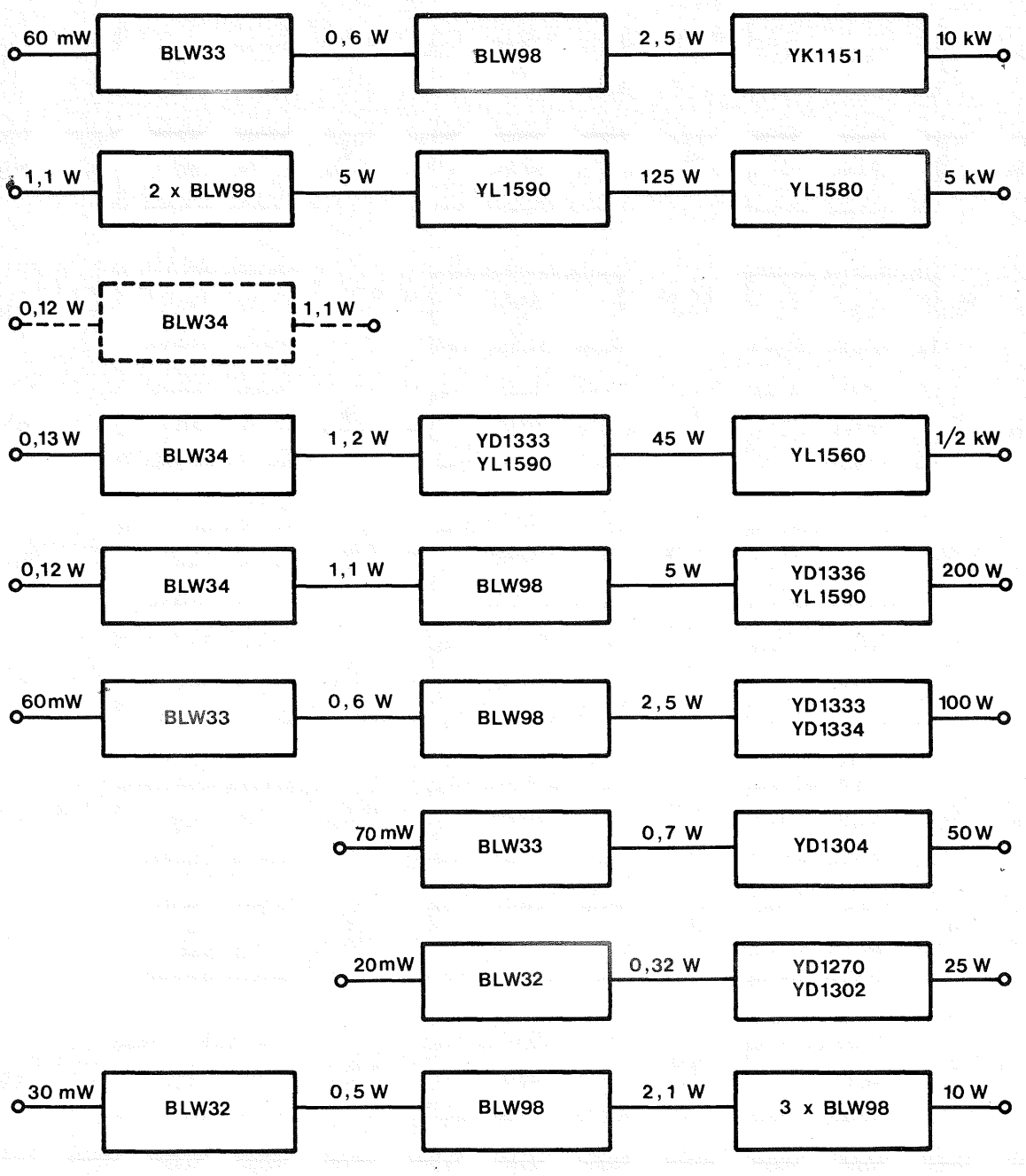
input power mW	1st stage	2nd stage	3rd stage	4th stage	$P_{o\ sync}$ W	V_{CE} V	stud S flange F
7	BFQ34	BLW34	BLW98		**3**		
3	BFQ34	BLW33	BLW98	2 x BLW98	**6**	25	S
5	BLW32	BLW34	2 x BLW98	4 x BLW98	**12**		

line-ups

BAND III TRANSPOSERS

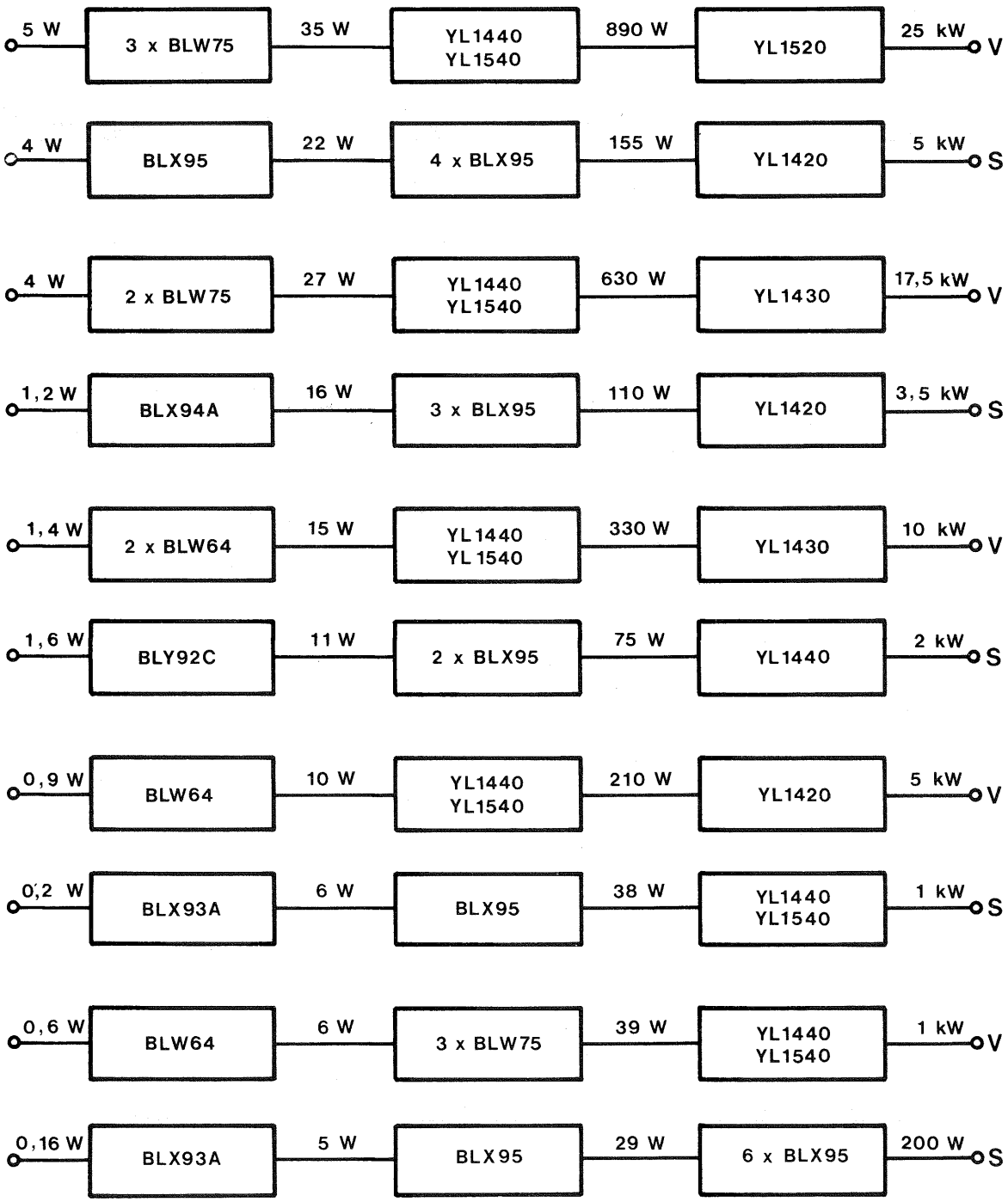


BAND IV/V TRANSPOSERS

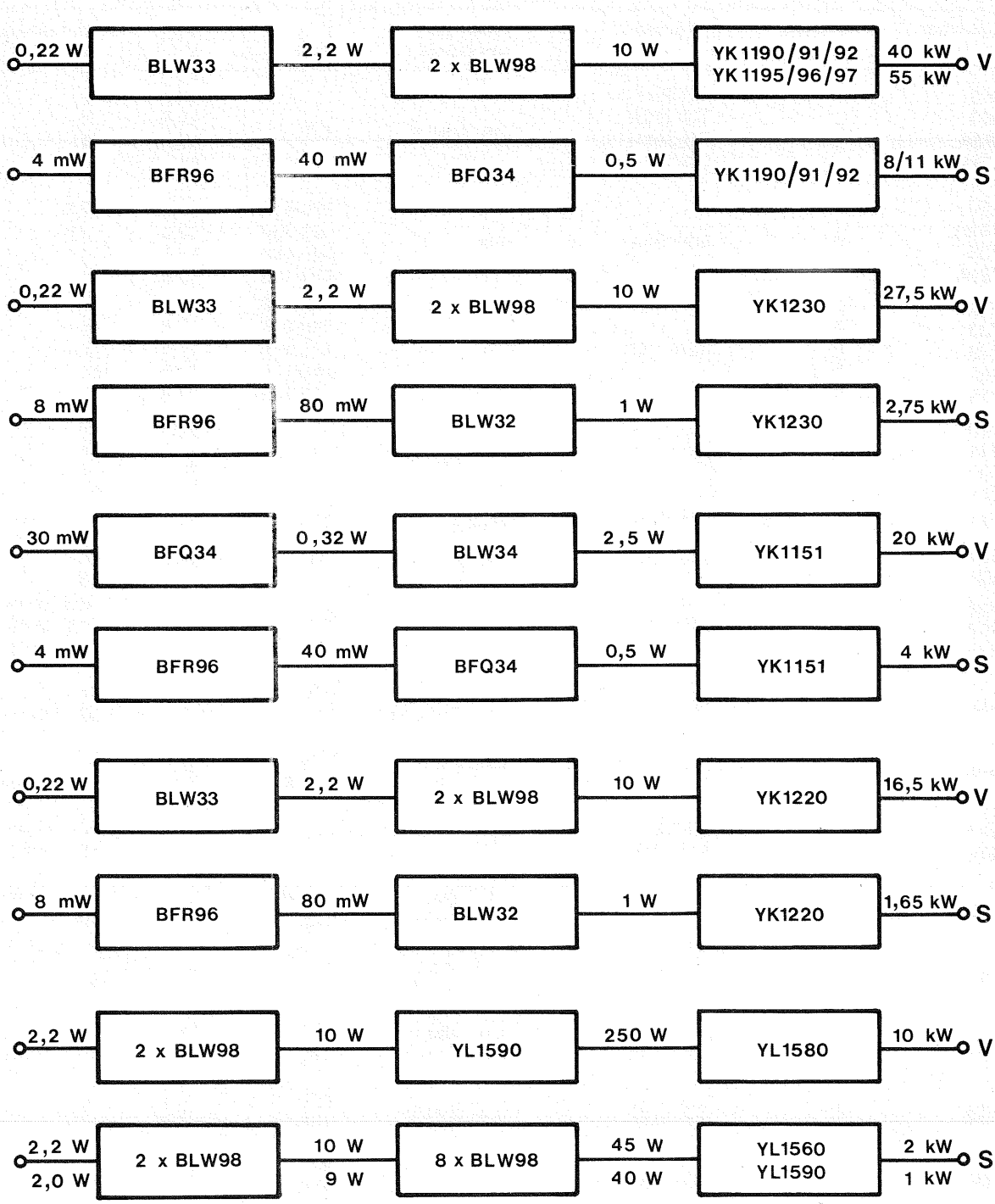


line-ups

BAND III TRANSMITTERS



BAND IV/V TRANSMITTERS



abridged data

For detailed information
Handbook SC4a

type number	status code	envelope	mode of operation	f MHz	V_{CE} V	output power W		Gp dB
BFQ42		TO-39(1)			13,5	2		11
BFQ43	D	TO-39(3)	c.w. class-B	175	13,5	4		12
BFS22A		TO-39(1)			13,5	4		8
BFS23A		TO-39(1)			28	4		10
BGY22				380-512	13,5	2,5		17
BGY22A	D	SOT-75A	c.w.	420-480	12,5	2,5		17
BGY23				380-480	13,5	7		4,5
BGY23A				420-480	12,5	7		4,5
BGY32	D			68- 88	12,5	18		22,6
BGY33	D			80-108	12,5	18		22,6
BGY35	D	SOT-132	c.w.	132-156	12,5	18		20,8
BGY36	D			148-174	12,5	18		20,8
BGY38	N			156-163	13,5	31		21
BLV10					13,5	8		9
BLV11	D	SOT-123	c.w. class-B	175	13,5	15		8
BLV20					28	8		12
BLV21					28	15		10
BLV33	N	NO-207B	class-A	225	25	19		9
BLW29	D	SOT-120	c.w. class-B	175	13,5	15		10
BLW31						28		9
BLW32						0,5	(note 1)	11
BLW33	D	SOT-122	class-A	860	25	1,0	(note 1)	10
BLW34						1,8	(note 1)	9
BLW60	C	SOT-56	c.w. class-B	175	12,5	45		5,5
			s.s.b. class-AB	1,6-28	12,5	3-30	(note 2)	19,5
BLW60C	D	SOT-120	c.w. class-B	175	12,5	45		5,5
			s.s.b. class-AB	1,6-28	12,5	3-30	(note 2)	19,5
BLW64	D	SOT-56	class-A	224,25	25	10	(note 3)	9,5
BLW75		SOT-105				14	(note 3)	8
BLW76	D	SOT-121A	s.s.b. class-AB	1,6-28	28	8-80	(note 2)	13
			c.w. class-B	108		80		7,9
BLW77	D	SOT-121B	s.s.b. class-AB	1,6-28	28	15-130	(note 2)	12
			c.w. class-B	87,5		130		7,5
BLW78	D	SOT-121A	c.w. class-B	150	28	100		6
			s.s.b. class-A	28	26	30	(note 4)	19,5
BLW79	D	SOT-122	c.w. class-B	470	12,5	2		9
				175				13,5
BLW80	D	SOT-122	c.w. class-B	470	12,5	4		8
				175				15

Notes: 1. $P_{o\ sync}$ at $d_{im} < -60$ dB. 2. P.E.P. at $d_3 < -30$ dB. 3. $P_{o\ sync}$ at $d_{im} < -55$ dB. 4. P.E.P. at $d_3 < -40$ dB.

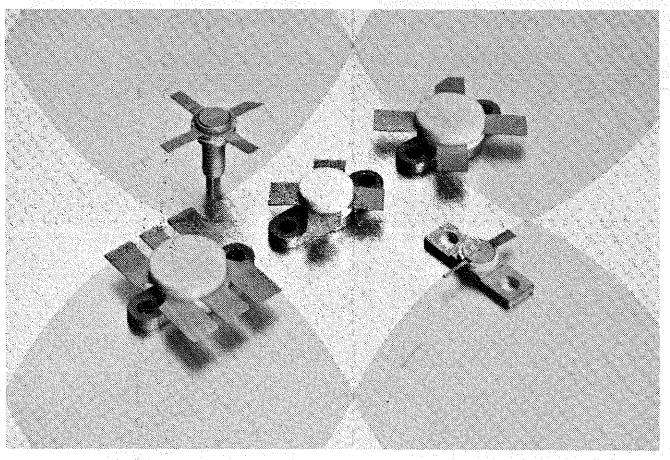
Our data handbooks are unique in the amount of information they contain. For standard operating conditions:

- read-off curves for power gain, input impedance, output impedance versus operating frequency
- circuit schematic
- print layout
- component mounting diagram
- VSWR curves
- d.c. SOAR curve
- r.f. SOAR curve

type number	status code	envelope	mode of operation	f MHz	V_{CE} V	output power W		Gp dB
BLW81	D	SOT-122	c.w. class-B	470 175	12,5	10		6 13,5
BLW82	D	SOT-119	c.w. class-B	470	12,5 13,5	30		5 6,1
BLW83	D	SOT-123	s.s.b. class-A s.s.b. class-AB	1,6-28	26 28	0-10 3-30		20 21
BLW84	D	SOT-123	c.w. class-B	175	28	25		9
BLW85	D	SOT-123	c.w. class-B s.s.b. class-AB	175 1,6-28	12,5	45 3-30	(note 1)	5 19,5
BLW86	D	SOT-123	c.w. class-B s.s.b. class-AB s.s.b. class-A	175 1,6-28 1,6-28	28 28 26	45 5-47,5 17	(note 1) (note 2)	7,5 19 22
BLW87	D	SOT-123	c.w. class-B	175	13,5	25		6
BLW95	D	SOT-121A	s.s.b. class-AB	28	50	160		14
BLW96	N	SOT-121A	s.s.b. class-AB	1,6-28	50	200	(note 1)	13,5
BLW98	D	SOT-122	class-A	860	25	3,5	(note 3)	6,5
BLX13	C	SOT-56	s.s.b. class-A s.s.b. class-AB c.w. class-B	28 28 70	26 28 28	0-8 25 25	(note 2) (note 1)	18 18 17
BLX13C	D	SOT-120	s.s.b. class-A s.s.b. class-AB	1,6-28	26 28	0-8 3-25	(note 2) (note 1)	20 21
BLX14	C	SOT-55	s.s.b. class-A s.s.b. class-AB c.w. class-B c.w. class-B	1,6-28 1,6-28 70 30	28	15 7,5-50 50 50	(note 2) (note 1)	13 13 7,5 16
BLX15	D	SOT-55	s.s.b. class-AB s.s.b. class-A c.w. class-B c.w. class-B	1,6-28 1,6-28 70 108	50 40 50 50	20-150 30 150 150	(note 1) (note 2)	14 14 10 7,5
BLX39	D	SOT-120	c.w. class-B s.s.b. class-AB s.s.b. class-A	175 1,6-28 1,6-28	28 28 26	45 5-42,5 15	(note 1) (note 2)	7,5 19 20
BLX65	D	TO-39(1)	c.w. class-B	470 175	12,5	2		6 12
BLX66	D	SOT-48(4)	c.w. class-B	470 175	12,5	2,5 3		8,5 20
BLX67	C	SOT-48(1)	c.w. class-B	470 175	12,5	2,5 3		8,5 20

Notes: 1. P.E.P at $d_3 < -30$ dB. 2. P.E.P at $d_3 < -40$ dB. 3. $P_{o\ sync}$ at $d_{im} < -60$ dB.

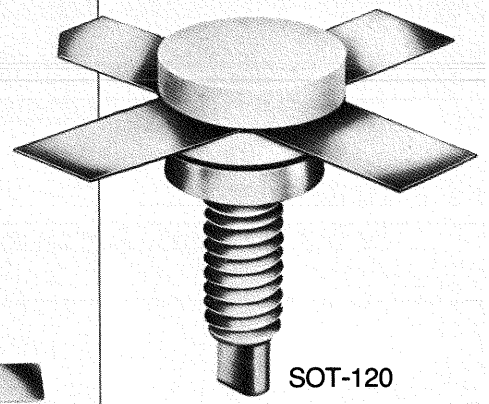
abridged data



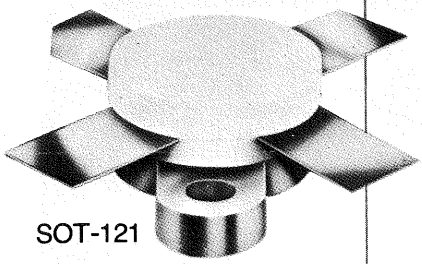
type number	status code	envelope	mode of operation	f MHz	V_{CE} V	output power W	Gp dB
BLX68	C	SOT-48(1)	c.w. class-B	470 175	12,5	7 7,2	5 12,6
BLX69A	D	SOT-48(2)	c.w. class-B	470	13,5	20	4
BLX91A		SOT-48(1)				1	11
BLX92A	D	SOT-48(1)	c.w. class-B	470	28	2,5	11
BLX93A		SOT-48(1)				7	8,5
BLX94A		SOT-48(2)				25	6
BLX95	D	SOT-56	c.w. class-B	470	28	40	4,5
BLX96		SOT-48(3)				0,5 (note 1)	6
BLX97	C	SOT-48(3)	class-A	860	25	1,0 (note 1)	5,5
BLX98		SOT-48(2)				3,5 (note 1)	5
BLY87A	C	SOT-48(2)				8	9
BLY87C	D	SOT-120				8	12
BLY88A	C	SOT-48(2)	c.w. class-B	175	13,5	15	7,5
BLY88C	D	SOT-120				15	8
BLY89A	C	SOT-56				25	6
BLY89C	D	SOT-120				25	6
BLY90	D	SOT-55	c.w. class-B	175	12,5	50	5
BLY91A	C	SOT-48(1)				8	12
BLY91C	D	SOT-120	c.w. class-B	175	28	8	12
BLY92A	C	SOT-48(1)				15	10
BLY92C	D	SOT-120				15	10
BLY93A	C	SOT-56				25	9
BLY93C	D	SOT-120	c.w. class-B	175	28	25	9
BLY94	D	SOT-55				50	7
PKB20010U				2000		12	6
PKB23001U	D	FO53	c.w. class-C	2300	28	1,5	7
PKB23005U				2300		8	7,2
2N3375	C	TO-60	c.w. class-B	100 400	28	7,5 3	8,8 4,8
2N3553	C	TO-39(1)		175		2,5	10
2N3632	C	TO-60	c.w. class-B	175	28	13,5	5,9
2N3866	D	TO-39(1)		400		1	10
2N3924		TO-39(1)				4	6
2N3926	C	TO-60	c.w. class-B	175	13,5	7	5,4
2N3927		TO-60				12	4,8
2N4427	D	TO-39(1)	c.w. class-B	175	12	1	10

Note:
1. $P_{o\ sync}$ at $d_{im} < -60$ dB.

SOT-132



SOT-120



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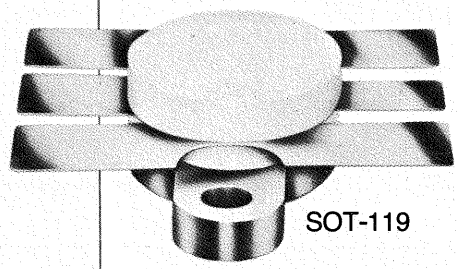

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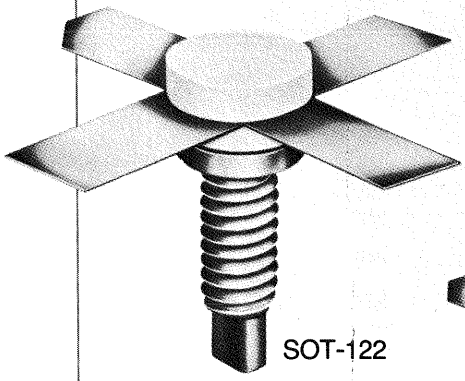

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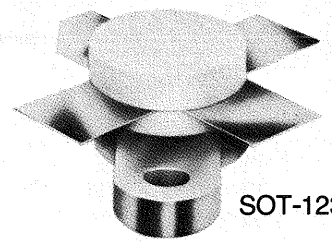

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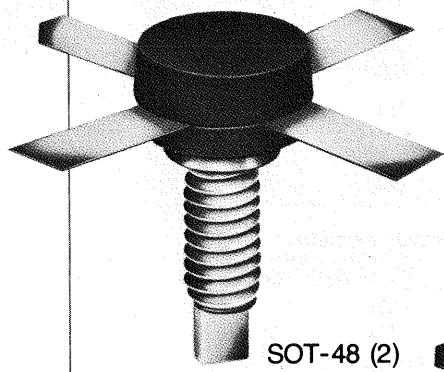
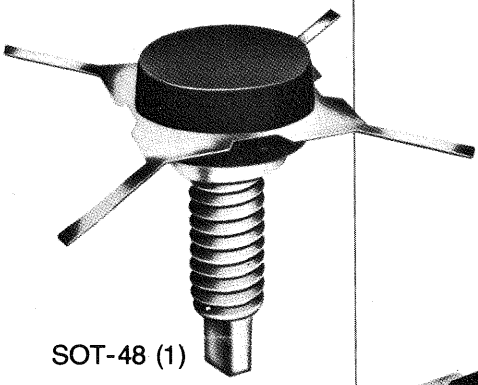


SOT-48 (2)



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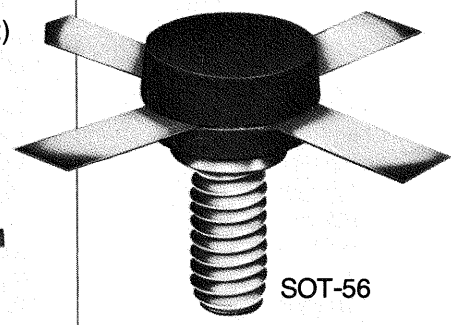
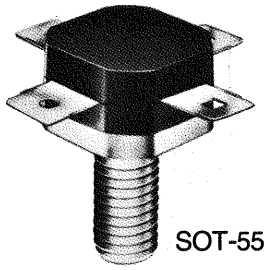
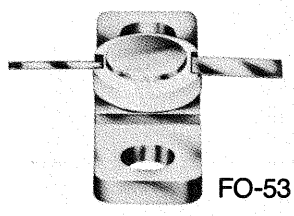


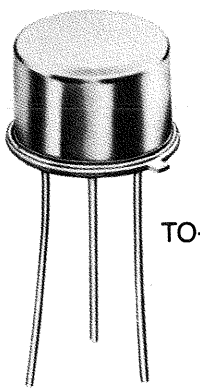
SOT-56



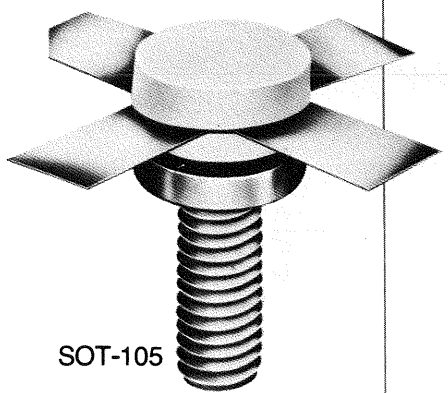
SOT-55



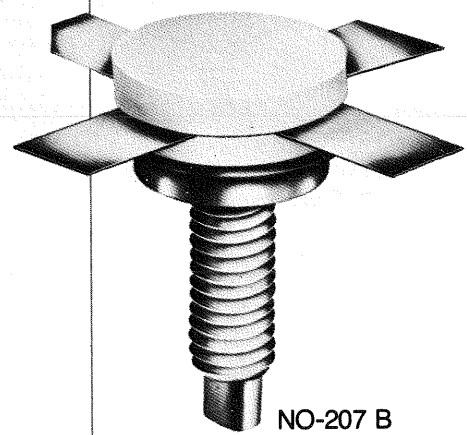
FO-53



TO-39



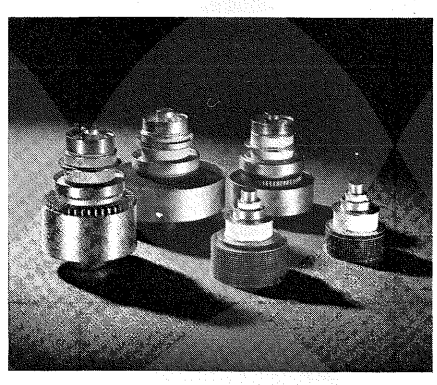
SOT-105



NO-207 B

transmitting tubes

tv service
tv transposer service



Triodes for transposer service

Cooling: forced air

Tetrodes for television service

type	output power sync	power gain	frequency at full ratings max	V_f	I_f	V_a	V_{g2}	I_a sync black	V_a max	W_a max sync	h x dia. max
	kW	dB	MHz	V	A	kV	V	A	kV	kW	mm
YL1590	**0,6**	15,4	1000	3,9	52	3,5	700	0,64	4,0	2	108 x 73
YL1540	**1,15**	20	260	4,2	53	3	700	0,7	4	2	122 x 63,3
YL1440	**1,55**	26					500			1,5	125 x 63,3
YL1560	**5,5**	16,5	1000	5	130	5,5	700	1,9	6	7	153 x 140,3
YL1420	**8,6**	24	260	6,3	120	5	600	2,1	6,5	6	174 x 125,1
YL1580	**12**	16,5	1000	7	130	6	800	2,7	7,2	12	181 x 191,6
YL1430	**18,4**	25	260	8	120	7	700	2,9	9	12	211 x 164,2
YL1520	**27,5**	28,5	260	11,5	120	8	700	4	9	18	226 x 164,2
YL1530	**37,5**	15	260	7,5	175	9	900	4,5	12	30	264 x 215

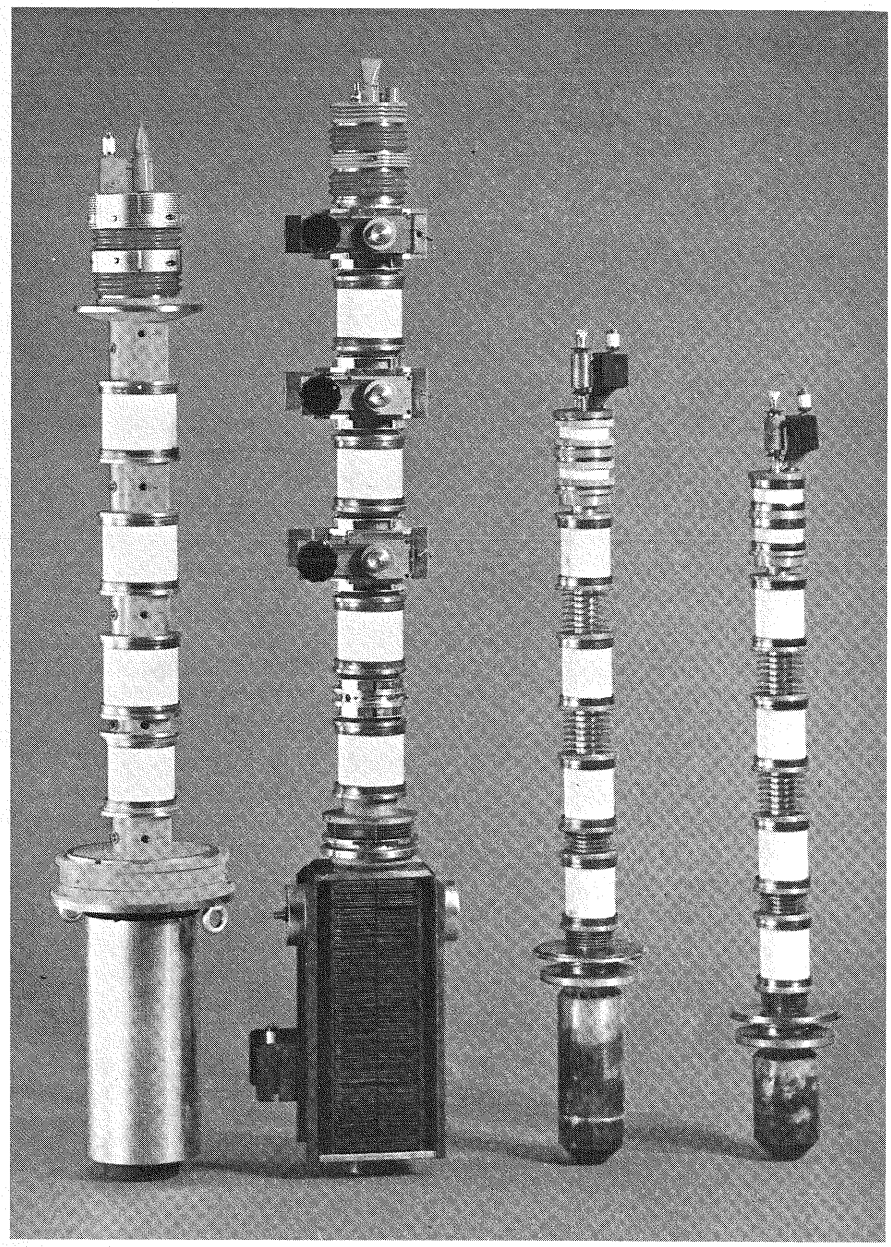
Triodes for television transposer service

type	output power sync	power gain	frequency at full ratings max	V_f	I_f	V_a	I_a	V_a max	W_a max	h x dia. max
	W	dB	MHz	V	A	kV	A	kV	kW	mm
YD1270	**25**	19	1000	6,3	1,2	1,5	0,12	1,7	0,2	88,6 x 50,5
YD1303	**25**	20	1000	5	2,0	1,2	0,10	2	0,15	55,5 x 68,1
YD1300	**35**	20	1000	5	2,0	1,7	0,12	2	0,3	55,2 x 45,4
YD1302	**55**	19	1000	5	2,1	1,9	0,13	2	0,325	64,2 x 54,1
YD1304	**55**	19	1000	5	2,5	1,8	0,13	2	0,325	64,2 x 54,1
YD1333	**110**	16,5	1000	6,3	5,3	2	0,25	3,5	0,9	88,5 x 71
YD1334	**110**	16,5	1000	6,3	5,3	2,5	0,25	3,5	1,8	96,5 x 96
YD1330	**220**	16,5	1000	6,3	5,3	3	0,42	3,5	1,8	106 x 71
YD1336	**220**	16,5	1000	6,3	5,3	3	0,42	3,5	1,8	96,5 x 96
YD1335	**550**	15	1000	6,3	5,3	3,5	0,25	3,8	1,9	96,5 x 96
YD1337	**400**	15	1000	6,3	5,3	1,7	0,40	2,2	0,7	88,5 x 71

Tetrodes for television transposer service

type	output power sync	power gain	frequency at full ratings max	V_f	I_f	V_a	V_{g2}	I_a	V_a max	W_a max	h x dia. max
	kW	dB	MHz	V	A	kV	V	A	kV	kW	mm
YL1590	**0,22**	15,6	1000	3,9	52	3,5	700	0,62	4	2	108 x 73
YL1440	**0,55**	15	260	4,2	53	2,5	600	0,73	4	1,5	125 x 63,3
YL1560	**2,2**	16,5	1000	5	130	5,5	700	1,8	6	7	152 x 140,3
YL1420	**2,5**	15	260	6,3	120	4	700	1	6,5	6	174 x 125,1
YL1580	**4,4**	17	1000	7	130	6,5	700	2,9	7,5	14	181 x 191,6
YL1430	**7**	15	260	8	120	6	800	1,2	9	12	211 x 164,2
YL1520	**10,5**	16	260	11,5	120	8	900	1,8	9	18	225 x 164,2

u.h.f. power klystrons



Our range of klystrons covers the output power classes between 10 and 58 kW over the tv bands IV and V. They are designed such that high efficiency can be obtained in combination with a high gain.
YK1195, YK1196 and YK1197 deliver 58 kW in three overlapping bands between 470 and 860 MHz. Each tube requires its own accessories. The tubes are vapour cooled and electro-magnetically focused.
YK1190, YK1191 and YK1192 are similar to the foregoing but deliver only 45 kW.
YK1151 can deliver 25 kW over both bands IV and V; therefore two sets of accessories are available. The tube is air cooled and permanent magnetically focused.
YK1230 can deliver 27,5 kW over both bands IV and V using only one set of accessories. The tube is electro-magnetically focused and can be alternatively used for water, vapour or vapour-condensation cooling. YK1220 is similar to the foregoing tube but can deliver only 16,5 kW.

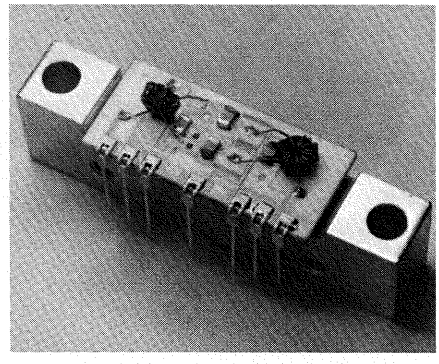
type	frequency range MHz	output power (peak sync) kW	gain dB	beam voltage kV	beam current A	efficiency %	focusing
YK1151	470 to 860	12,5	40	20 *	2,1	39	permanent magnetic
YK1151	470 to 860	25	44	24 *	3,0	41	permanent magnetic
YK1190	470 to 610	45	41	25,5	3,8	48	electromagnetic
YK1191	590 to 720	45	44	25,5	3,8	48	electromagnetic
YK1192	710 to 860	45	41	25,5	3,9	46,5	electromagnetic
YK1195	470 to 610	58	37	26	4,85	47,5	electromagnetic
YK1196	590 to 720	58	39	26	4,85	47,5	electromagnetic
YK1197	710 to 860	58	40	27	4,9	45	electromagnetic
YK1220	470 to 860	16,5	28	17,5	2	45	electromagnetic
YK1230	470 to 860	27,5	36	23,5	2,5	45	electromagnetic

* Operation with depressed collector potential.

wideband transistors and modules

selection guide

Wideband transistors for MATV and CATV modules,
with long-term reliability.



CATV module.

BFQ34 and **BFR94** meet all NCTA cross-modulation and DIN inter-modulation requirements.
We guarantee 12-channel cross-modulation distortion to NCTA standard (> –105 dB) and three-tone intermodulation according to DIN norm.

Islanded collector area prevents "hot spots" and diffused emitter ballast resistors (20) avoid second breakdown, hence rugged devices.

Ti-Pt-Au metallization:
Gold for conduction;
Titanium for adhesion;
Platinum as migration barrier.

Corresponding types in SOT-23 or SOT-89

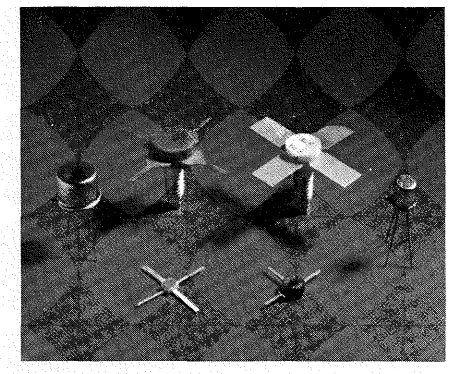
	SOT-23	SOT-89
BFQ23	**BFT93**	—
BFQ34	—	**BFQ18**
BFR90	**BFR92**	—
BFR91	**BFR93**	—
BFR96	—	**BFQ19**
BFW16A	—	**BFQ17**
BFW30	**BFR53**	—
BFY90	**BFS17**	—

Application	Recommended types
wideband aerial amplifiers band I up to V (40-860 MHz) wideband distribution amplifiers	BFQ22 to 24, BFQ32, BFQ34 BFR34, BFR90, 90A, 91, BFR95, 96, BFW30, BFW92, 93, BFX89, BFY90
low noise wideband amplifiers in measuring equipment r.f. amplifiers and mixers for communication systems (microwave link radar i.f. amplifiers)	BFQ22 to 24, BFQ34 BFR49, BFR90, 90A, 91, BFY90
high output channel and band aerial amplifiers in driver and final stages channel amplifiers in CATV and MATV wideband amplifiers	BFQ34, BFR64, 65, BFR95 BFW16A, 17A
high-voltage output stages in CATV wideband amplifiers	BFQ34, BFR94

CATV amplifier modules

			CIRCUIT VALUES						
type	status	case	V_B	I_{tot} max	T_{mb} max	G_P	flatness 40 to 300 MHz	V_o at –60 dB distortion	F max
			V	mA	°C	dB	dB	dBmV	dB
BGY37	C	SOT-115	24	220	90	16,4	± 0,1	65	7
BGY50	D	SOT-115	24	180	90	12,5	≤ 0,2	61	7
BGY51	D	SOT-115	24	220	90	12,5	≤ 0,2	63,5	8
BGY52	D	SOT-115	24	180	90	16,4	≤ 0,1	61	6
BGY53	D	SOT-115	24	220	90	16,4	≤ 0,1	63,5	7
BGY54	D	SOT-115	24	180	90	17,0	≤ 0,1	61	6
BGY55	D	SOT-115	24	220	90	17,0	≤ 0,1	63,5	7

abridged data



Wideband transistors

type all n-p-n	status	case	CIRCUIT VALUES (TYP) f	P_o*	Gp (G_{UM})	V_{CE}	I_C	RATINGS V_{CEO}	I_{CM}	P_{tot}	CHARACTERISTICS h_{FE}	f_T typ	F typ
			MHz	mW	dB	V	mA	V	mA	mW		GHz	dB
BFX89	D	TO-72	200 800	6	22 7	10	8	15	50	200	20-150	1,2	3,3 7,0
BFW92	D	SOT-37	200 800	8	23 11	10	10	15	50	190	20-150	1,6	4 at 500 MHz
BFY90	D	TO-72	200 800	12	23 8	10	14	15	50	200	25-150	1,4	2,5 5,5
BFW30	D	TO-72	200 800	15	21 7,5	5	30	10	100	250	> 25	1,6	< 5,0 at 500 MHz
BFW93	D	SOT-37	200 800	15	(22) (10,5)	5	30	10	100	190	> 25	1,7	< 5,0 at 500 MHz
BFW16A	D	TO-39	200 800	150 90	16 6,5	18	70	25	300	1500	> 25	1,2	< 6,0 —
BFW17A	D	TO-39	200	150	16	18	70	25	300	1500	> 25	1,1	—
BFR64	D	SOT-48	200 800	150 90	16 6,5	20	70	25	500	3500	> 25	1,2	6,0 —
BFR65	D	SOT-48	200 800	450 —	19 4,5	20	200	25	1000	5000	> 30	>1,2	— —

type	polarity	status	case	CHARACTERISTICS (TYP) dim** at conditions	$f_{(p+q-r)}$	V_{CE}	I_C	V_o	G_{UM} typ	F typ	at f
				dB	MHz	V	mA	mV	dB	dB	MHz
BFQ22	N	D	TO-72	—	—	—	—	—		1,9	500
BFQ23	P	D	SOT-37	–60	493,25	5	30	300	16,5	2,4	500
BFQ24	P	D	TO-72	—	—	—	—	—		2,4	500
BFQ32	P	D	SOT-37	–60	493,25	10	50	500	14	3,75	500
BFQ34	N	D	SOT-122	–60	793,25	15	120	1200	16	8	500
BFQ51	P	N	SOT-37	—	—	—	—	—	19	2,6	500
BFQ52	P	N	TO-72	—	—	—	—	—	17	2,7	500
BFQ53	N	N	TO-72	—	—	—	—	—	18	2,4	500
BFR49	N	D	SOT-100	—	—	—	—	—	17	2,5	1000
BFR90 **BFR90A**	N N	D N	SOT-37	–60	493,25	10	14	150	19,5	2,4	500
BFR91	N	D	SOT-37	–60	493,25	5	30	300	16,5	1,9	500
BFR94	N	D	SOT-48	–60	493,25	20	90	700	13,5	5	200
BFR95	N	D	TO-39	–61	194,25	18	80	1000	13,5	9	200
BFR96	N	D	SOT-37	–60	493,25	10	50	500	16	3,3	500

* VSWR at output < 2 measured at $f_{(2q-p)}$.
f_p = 202 MHz, f_q = 205 MHz or f_p = 798 MHz, f_q = 802 MHz.
** Intermodulation distortion measured according to DIN three-tone test.

wideband transistors and modules

hybrid i.c. amplifiers

Intended for use in RATV, MATV and CATV systems and for general purposes in v.h.f. and u.h.f. applications.

All amplifiers:

frequency range	f	40 to 860 MHz
source and load (characteristic) imp.	$R_S = R_\ell = Z_O$	75 Ω
operating ambient temperature	T_{amb}	–20 to + 70 °C
operating mounting-base temperature (OM323; A and OM337; A)	T_{mb}	–30 to + 100 °C
pinning (except OM322)	suitable for 0,1-inch grid	
finish	resin coated	

Typical characteristics at V_B = 24 V ± 10%

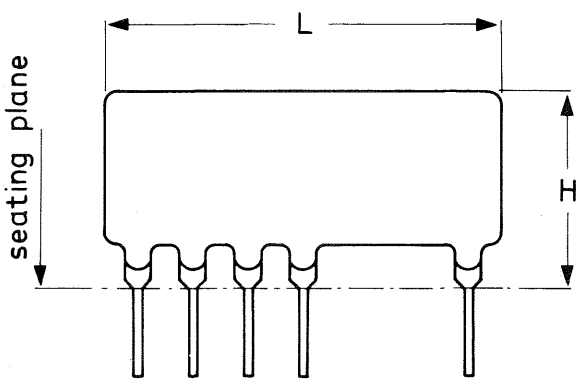
type	gain $\lvert s_f \rvert^2$ dB	V_O(r.m.s.)* dBμV	supply current mA	noise figure dB	max VSWR typical values input	output	dimensions L mm	H mm
OM320	15,5	92	23	5,5	2,2	2,5	30	12
OM321	15,5	98	33	6	2,5	2	30	12
OM322	15	103	60	7	1,7	1,7	—	—
OM323; A**	15	113	100	9	1,9	2,3	30	18
OM335	27	98	35	5,5	1,9	3,2	30	18
OM336	22	105	65	7	1,4	1,6	30	19
OM337; A**	26	112	115	9,8	2,3	1,8	30	18
OM339	28	105	67	6	1,5	1,5	30	19

Typical characteristics at V_B = 12 V ± 10%

OM350	18	98	18	6	1,5	1,9	18	9
OM360	23	105	55	7	1,4	1,6	26	9
OM361	28	105	50	6	1,3	1,5	26	9

* Minimum output voltage at –60 dB intermodulation distortion (DIN 45004, 3-tone, f = 470 MHz).

** The OM323A and OM337A need an external collector-coil and blocking capacitor, whereas, the OM323 and OM337 have these components built-in.



Conversion table for 75 Ω impedance

dBμV	mV	dBm
92	39,8	– 16,75
98	79,4	– 10,75
103	141,3	– 5,75
105	177,8	– 3,75
112	398,1	+ 3,25
113	446,7	+ 4,25

fibre-optic communications

emitters-receivers

Optical fibre technology has matured to the point where it is a serious contender to take over many of the traditional tasks of coaxial cable. Amongst its advantages are

- very large bandwidth, high information capacity
- immunity to electromagnetic interference
- low attenuation, independent of frequency
- electrical isolation of input and output, no earth-loop problems
- wide-range temperature independence

As input and output devices for optical fibres, the emitters and receivers listed here are but the first in a projected range of Philips products for fibre-optic signal transfer in the broadcasting and telecommunication industries.

Emitters – GaAlAs DHJ LED modules	
OF840 **OF841**	A small light guide (diameter 200 μm) achieves the optical coupling with the emitting junction (NA ~ 0,5). The module is designed to be the active component of either a BNC, TNC of RIM–SMA optical connector.
OF842 **OF843**	The emitting junction is coupled to a step index optical fibre. (core diameter 200 μm)

Reverse current at V_R = 2 V		I_R	max	200 μA
Forward current (d.c.)		I_F	max	100 mA
Total power dissipation up to T_{amb} = 25 °C		P_{tot}	max	200 mW
Radiant intensity on axis at I_F = 50 mA	OF840; 842	I_o	typ	300 μW.sr^{-1}
	OF841; 843	I_o	typ	150 μW.sr^{-1}
Wavelength at peak emission		λp	typ	830 nm

Receivers – Si P.I.N. photodiode modules	
OF844	The sensitive area is coupled to a step index optical fibre (core diameter 200 μm)
OF845	A small light guide (diameter 600 μm) achieves the optical coupling with the sensitive area. The module is designed to be the active component of either a BNC, TNC or RIM–SMA optical photoreceiver.

Continuous reverse voltage		V_R	max	50 V
Dark reverse current (V_R = 10 V)	OF844	$I_{R(D)}$	typ	100 pA
	OF845	$I_{R(D)}$	typ	200 pA
Sensitivity at λ = 830 nm		S	typ	0,40 A/W
Wavelength at peak response		λp	typ	830 nm