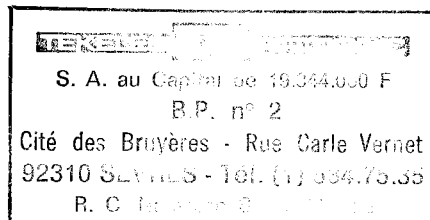


SHORTFORM

Semiconductor Products and Systems 1983



This publication aims to provide condensed information on the vast range of standard devices currently produced by SGS.

For easy consultation the products have been divided into several sections according to the main product families and in some cases depending on the main application sectors.

Each device is presented along with its essential electrical characteristics. If further information is required SGS will provide individual data sheets for all the devices on request.

All the data sheets for the individual devices are collected in "databooks" organized according to product families. These can be acquired through SGS sales network.

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40208B	58	M74HC192B1	64	M74HC4017B1	64	T54/74LS26	66
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Telecommunications is for SGS a priority market. The company sees its present and near future technology as being exactly suited to this market.

In addition the IRI-STET group (of which SGS-ATES is a member) has a heavy bias towards telecommunications which naturally gives an added incentive to the company's commitment to telecomms.

To date SGS has been involved in a number of projects with both Italian and other worldwide telecommunications manufacturers.

SGS has a wide range of products, both actual and under development for telecomms, that can roughly be split into two groups, telephone and centralized equipment.

In the sector of telephone equipment SGS has developed a lead in the production of integrated speech circuits and has produced, in addition to the world's first integrated speech circuit, the LS285, the LS156 for the Italian market and the LS288 according to German specifications.

At present the SGS telephone range includes:

- speech circuit
- dual tone MF generators
- line interface circuits
- loop disconnect diallers
- electronic bells
- protection circuits

The range of devices for centralized equipment includes:

- crosspoints
- balanced modulators
- channel amplifiers
- expandors
- CODECs and PCM filter
- op-amps.
- digital switching matrix
- crosspoints for PABX's

Other products not specifically intended for the telecomms market included a wide range of switching transistors, linear and digital integrated circuits.

These products coupled with the range of microprocessors which include the Z8, Z80, Z8000 and M3870 families, give SGS a very strong presence in the telecomms field.

INDEX OF THE SGS PRODUCT RANGE

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SGS PRODUCTS IN TELECOMMUNICATIONS EQUIPMENT

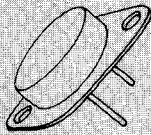
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POWER TRANSISTORS

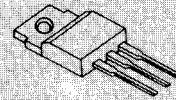


SGS power transistors cover a wide range of technologies optimized for almost every application. These include epitaxial base (medium voltage, high ruggedness, general purpose) epitaxial planar (high speed with good voltage capability) multiepitaxial planar (high current switching) and multiepitaxial mesa (high voltage-high power switching) and NOW N-channel POWER MOS. A wide choice of packages are available.

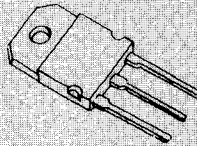
In order to be easy to use following power transistor selector guides cover only a part of the complete range. Other voltage ratings and gain selections shown on the full data sheets are equally available. Many older devices which are less popular for new designs are also in production. Your nearest SGS sales office or distributor has full details available on request.



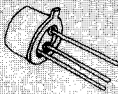
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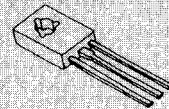
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POWER TRANSISTORS & DARLINGTONS



GENERAL PURPOSE

EPITAXIAL BASE – I_{CM} 1 to 15A; V_{CEO} 22 to 180V

NPN and PNP types

(perfect complementary pairs)

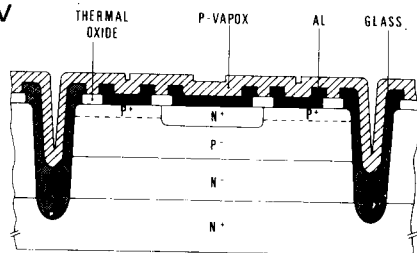
Medium V_{CEO} range (22 to 100V)

Medium switching speed

Medium f_T (2 to 20 MHz)

High ruggedness

Monolithic Darlington capability



EPITAXIAL BASE

I_C (A)	V_{CBO} (V)	V_{CEO} (V)	P_{tot} (W)	Package	NPN	PNP	@		@	
							h_{FE} min	I_C/V_{CE} (A/V)	V_{CEsat} max (V)	I_C/I_B (A/mA)
1	40	40	30	TO-220	TIP29	TIP30	15	1/4	0.7	1/125
1	60	60	30	TO-220	TIP29A	TIP30A	15	1/4	0.7	1/125
1	80	80	30	TO-220	TIP29B	TIP30B	15	1/4	0.7	1/125
1	100	100	30	TO-220	TIP29C	TIP30C	15	1/4	0.7	1/125
2	45	45	25	TO-126	BD233	BD234	25	1/2	0.6	1/100
2	55	45	30	TO-220	BD239	BD240	15	1/4	0.7	1/200
2	60	60	25	TO-126	BD235	BD236	25	1/2	0.6	1/100
2	70	60	30	TO-220	BD239A	BD240A	15	1/4	0.7	1/200
2	100	80	25	TO-126	BD237	BD238	25	1/2	0.6	1/100
2	90	80	30	TO-220	BD239B	BD240B	15	1/4	0.7	1/200
2	115	100	30	TO-220	BD239C	BD240C	15	1/4	0.7	1/200
2	60	60	50	TO-220	TIP110	TIP115	1000	1/4	2.5	2/8
2	80	80	50	TO-220	TIP111	TIP116	1000	1/4	2.5	2/8
2	100	100	50	TO-220	TIP112	TIP117	1000	1/4	2.5	2/8
3	45	45	30	TO-126	BD175	BD176	15	1/2	0.8	1/100
3	60	60	30	TO-126	BD177	BD178	15	1/2	0.8	1/100
3	80	80	30	TO-126	BD179	BD180	15	1/2	0.8	1/100
3	55	45	40	TO-220	BD241	BD242	25	1/4	1.2	3/600
3	40	40	40	TO-220	TIP31	TIP32	25	1/4	1.2	3/375
3	70	60	40	TO-220	BD241A	BD242A	25	1/4	1.2	3/600
3	60	60	40	TO-220	TIP31A	TIP32A	25	1/4	1.2	3/375
3	90	80	40	TO-220	BD241B	BD242B	25	1/4	1.2	3/600
3	80	80	40	TO-220	TIP31B	TIP32B	25	1/4	1.2	3/375
3	80	80	40	TO-220	TIP31C	TIP32C	25	1/4	1.2	3/600
3	115	100	40	TO-220	BD241C	BD242C	25	1/4	1.2	3/600
3	100	100	40	TO-220	TIP31C	TIP32C	25	1/4	1.2	3/375

POWER TRANSISTORS & DARLINGTONS



EPITAXIAL BASE (continued)

I _C (A)	V _{CBO} (V)	V _{CEO} (V)	P _{tot} (W)	Package	NPN	PNP	@		@	
							h _{FE} min	I _C /V _{CE} (A/V)	V _{CEsat} max (V)	I _C /I _B (A/mA)
4	40	40	40	TO-126	2N5190	2N5193	25	1.5/2	0.6	1.5/150
4	60	60	40	TO-126	BD677	BD678	750	1.5/3	2.5	1.5/6
4	80	80	40	TO-126	BD679	BD680	750	1.5/3	2.5	1.5/6
4	80	80	40	TO-126	2N5192	2N5195	20	1.5/2	0.6	1.5/150
4	100	100	40	TO-126	BD681	BD682	750	1.5/3	2.5	1.5/6
4	22	22	36	TO-126	BD433	BD434	50	2/1	0.5	2/200
4	32	32	36	TO-126	BD435	BD436	50	2/1	0.5	2/200
4	45	45	36	TO-126	BD437	BD438	40	2/1	0.6	2/200
4	45	45	40	TO-126	BD675A	BD676A	750	2/3	2.8	2/8
4	45	45	50	TO-220	BD533	BD534	25	2/2	0.8	2/200
4	60	60	36	TO-126	BD439	BD440	25	2/1	0.8	2/200
4	60	60	40	TO-126	BD677A	BD678A	750	2/3	2.8	2/8
4	60	60	50	TO-220	BD535	BD536	25	2/2	0.8	2/200
4	80	80	36	TO-126	BD441	BD442	15	2/1	0.8	2/200
4	80	80	40	TO-126	BD679A	BD680A	750	2/3	2.8	2/8
4	80	80	50	TO-220	BD537	BD538	15	2/2	0.8	2/200
4	180	180	10	TO-39	BDW91	BDW92	1000	2/5	2	2/4
5	60	60	65	TO-220	TIP120	TIP125	1000	3/3	2	3/12
5	80	80	65	TO-220	TIP121	TIP126	1000	3/3	2	3/12
5	100	100	65	TO-220	TIP122	TIP127	1000	3/3	2	3/12
6	45	45	50	TO-220	BDW23	BDW24	750	2/3	2	2/8
6	60	60	50	TO-220	BDW23A	BDW24A	750	2/3	2	2/8
6	80	80	50	TO-220	BDW23B	BDW24B	750	2/3	2	2/8
6	100	100	50	TO-220	BDW23C	BDW24C	750	2/3	2	2/8
6	140	140	60	TO-220	BDX53E	BDX54E	500	2/5	2	2/10
6	150	150	15	TO-39	BDX53S	BDX54S	500	2/5	2	2/8
6	160	160	60	TO-220	BDX53F	BDX54F	500	2/5	2	2/10
6	45	45	65	TO-220	BD243	BD244	15	3/4	1.5	6/1000
6	40	40	65	TO-220	TIP41	TIP42	15	3/4	1.5	6/600
6	60	60	65	TO-220	BD243A	BD244A	15	3/4	1.5	6/1000
6	60	60	65	TO-220	TIP41A	TIP42A	15	3/4	1.5	6/600
6	80	80	65	TO-220	BD243B	BD244B	15	3/4	1.5	6/1000
6	80	80	65	TO-220	TIP41B	TIP42B	15	3/4	1.5	6/600
6	100	100	65	TO-220	BD243C	BD244C	15	3/4	1.5	6/1000
6	100	100	65	TO-220	TIP41C	TIP42C	15	3/4	1.5	6/600
7	80	70	40	TO-220	2N6292	2N6107	30	4/2	1	2/200
7	40	30	40	TO-220	2N6288	2N6111	30	4/3	1	3/300

* Darlington types.

POWER TRANSISTORS & DARLINGTONS



EPITAXIAL BASE (continued)

I_C (A)	V_{CBO} (V)	V_{CEO} (V)	P_{tot} (W)	Package	NPN	PNP	h_{FE} min	I_C/V_{CE} (A/V)	V_{CEsat} max (V)	I_C/I_B (A/mA)	
*	8	40	40	65	TO-220	2N6386					
*	8	45	45	60	TO-220	BDX53	BDX54	1000	3/3	2	3/6
*	8	60	60	60	TO-220	BDX53A	BDX54A	750	3/3	2	3/12
*	8	60	60	90	TO-3	MJ1000	MJ900	750	3/3	2	3/12
*	8	80	80	60	TO-220	BDX53B	BDX54B	1000	3/3	2	3/12
*	8	80	80	90	TO-3	MJ1001	MJ901	750	3/3	2	3/12
*	8	100	100	60	TO-220	BDX53C	BDX54C	1000	3/3	2	3/12
*	8	60	60	70	TO-220	TIP130	TIP135	750	3/3	2	3/12
*	8	80	80	70	TO-220	TIP131	TIP136	1000	4/4	2	4/16
*	8	100	100	70	TO-220	TIP132	TIP137	1000	4/4	2	4/16
*	10	45	45	100	TO-3	BDX85	BDX86	1000	3/3	2	4/16
*	10	60	60	100	TO-3	BDX85A	BDX86A	1000	3/3	2	4/16
*	10	80	80	100	TO-3	BDX85B	BDX86B	1000	3/3	2	4/16
*	10	100	100	100	TO-3	BDX85C	BDX86C	1000	3/3	2	4/16
*	10	60	60	125	SOT-93	TIP140	TIP145	1000	5/4	3	10/40
*	10	80	80	125	SOT-93	TIP141	TIP146	1000	5/4	3	10/40
*	10	100	100	125	SOT-93	TIP142	TIP147	1000	5/4	3	10/40
*	10	60	60	65	TO-220	2N6387		1000	5/3	2	5/10
*	10	60	60	150	TO-3	MJ3000	MJ2500	1000	5/3	2	5/20
*	10	60	60	150	TO-3	2N5877	2N5875	20	4/4	1	5/500
*	10	70	60	75	TO-220	MJE3055T	MJE2955T	20	4/4	1.1	4/400
*	10	80	60	150	TO-3	2N3715	2N3791	30	3/2	0.8	5/500
*	10	80	80	65	TO-220	2N6388		1000	5/3	2	5/10
*	10	80	80	150	TO-3	MJ3001	MJ2501	1000	5/3	2	5/20
*	10	80	80	150	TO-3	2N5878	2N5876	20	4/4	1	5/500
*	10	100	80	150	TO-3	2N3716	2N3792	30	3/2	0.8	5/500
*	12	45	45	75	TO-220	BD705	BD706	20	4/4	1	4/400
*	12	60	60	75	TO-220	BD707	BD708	15	4/4	1	4/400
*	12	80	80	75	TO-220	BD709	BD710	15	4/4	1	4/400
*	12	100	100	75	TO-220	BD711	BD712	15	4/4	1	4/400
*	12	60	60	125	SOT-93	BDV65	BDV64	1000	5/4	2	5/20
*	12	80	80	125	SOT-93	BDV65A	BDV64A	1000	5/4	2	5/20
*	12	100	100	125	SOT-93	BDV65B	BDV64B	1000	5/4	2	5/20
*	12	45	45	80	TO-220	BDW93	BDW94	750	5/3	2	5/20
*	12	60	60	80	TO-220	BDW93A	BDW94A	750	5/3	2	5/20
*	12	80	80	80	TO-220	BDW93B	BDW94B	750	5/3	2	5/20
*	12	100	100	80	TO-220	BDW93C	BDW94C	750	5/3	2	5/20
*	12	45	45	120	TO-3	BDX87	BDX88	1000	5/3	2	6/24

* Darlington types.

POWER TRANSISTORS & DARLINGTONS



EPITAXIAL BASE (continued)

I _C (A)	V _{CBO} (V)	V _{CEO} (V)	P _{tot} (W)	Package	NPN	PNP	h _{FE} min	@		I _C /I _B (A/mA)
								I _C /V _{CE} (A/V)	V _{CEsat} max (V)	
* 12	60	60	120	TO-3	BDX87A	BDX88A	1000	5/3	2	6/24
* 12	80	80	120	TO-3	BDX87B	BDX88B	1000	5/3	2	6/24
* 12	100	100	120	TO-3	BDX87C	BDX88C	1000	5/3	2	6/24
15	100	60	115	TO-3	2N3055E	MJ2955	20	4/4	1.1	4/400
15	45	45	90	TO-220	BD905	BD906	15	5/4	1	5/500
15	45	45	125	TO-3	BDW51	BDW52	20	5/4	1	5/500
15	60	60	90	TO-220	BD907	BD908	15	5/4	1	5/500
15	60	60	125	TO-3	BDW51A	BDW52A	20	5/4	1	5/500
15	80	80	90	TO-220	BD909	BD910	15	5/4	1	5/500
15	80	80	125	TO-3	BDW51B	BDW52B	20	5/4	1	5/500
15	100	100	90	TO-220	BD911	BD912	15	5/4	1	5/500
15	100	100	125	TO-3	BDW51C	BDW52C	20	5/4	1	5/500
15	50	40	150	TO-3	2N3771		15	15/4	2	15/1500
15	100	60	150	TO-3	2N3772		15	10/4	1.4	10/1500
* 16	60	60	150	TO-3	MJ4033	MJ4030	1000	10/3	4	16/80
* 16	80	80	150	TO-3	MJ4034	MJ4031	1000	10/3	4	16/80
* 16	100	100	150	TO-3	MJ4035	MJ4032	1000	10/3	4	16/80
* 20	60	60	160	TO-3	2N6282	2N6285	750	10/3	3	20/200
* 20	80	80	160	TO-3	2N6283	2N6286	750	10/3	3	20/200
* 20	100	100	160	TO-3	2N6284	2N6287	750	10/3	3	20/200
25	40	40	125	SOT-93	TIP35	TIP36	25	1.5/4	1.8	15/1500
25	60	60	125	SOT-93	TIP35A	TIP36A	25	1.5/4	1.8	15/1500
25	80	80	125	SOT-93	TIP35B	TIP36B	25	1.5/4	1.8	15/1500
25	100	100	125	SOT-93	TIP35C	TIP36C	25	1.5/4	1.8	15/1500
25	60	60	200	TO-3	2N5885	2N5883	20	10/4	1	15/1500
25	80	80	200	TO-3	2N5886	2N5884	20	10/4	1	15/1500
* 30	60	60	200	TO-3	MJ11012	MJ11011	200	30/5	4	30/300
* 30	90	90	200	TO-3	MJ11014	MJ11013	200	30/5	4	30/300
* 30	120	120	200	TO-3	MJ11016	MJ11015	200	30/5	4	30/300
30	40	40	200	TO-3	2N5301	2N4398	15	15/2	0.75	10/1000
30	60	60	200	TO-3	2N5302	2N4399	15	15/2	0.75	10/1000
30	80	80	200	TO-3	2N5303	2N5745	15	10/2	1	10/1000

* Darlington types.

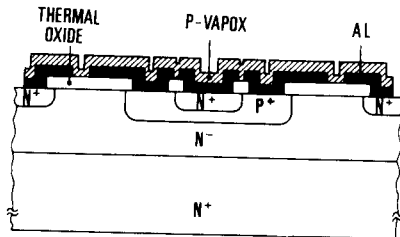
POWER TRANSISTORS & DARLINGTONS



LOW & MEDIUM VOLTAGE FAST SWITCHING

EPITAXIAL PLANAR - I_{CM} 0.5 to 10A; V_{CEO} 45 to 350V

- NPN and PNP types
- Good voltage capability (V_{CES} up to 400V)
- Low saturation voltage
- Low leakage
- Very high f_T (up to 100 MHz).
- Very high speed
- Moderate ruggedness
- Total base-collector passivation



EPITAXIAL PLANAR

I_C (A)	V_{CBO} (V)	V_{CEO} (V)	P_{tot} (W)	Package	NPN	PNP	h_{FE} @		V_{CESat} @	
							min	I_C/V_{CE} (A/V)	max (V)	I_C/I_B (A/mA)
0.5	300	300	20	TO-126	MJE340	MJE350	30	0.05/10	—	—
1	45	45	12	TO-126	BD135	BD136	40	0.15/2	0.5	0.5/50
1	60	60	12	TO-126	BD137	BD138	40	0.15/2	0.5	0.5/50
1	80	80	12	TO-126	BD139	BD140	40	0.15/2	0.5	0.5/50
1	120	120	10	TO-39	2N5682	2N5680	40	0.25/2	1	0.5/50
1	200	200	10	TO-39		2N5415	30	0.05/10	2.5	0.05/5
1	300	250	10	TO-39	2N3440		40	0.02/10	0.5	0.05/4
1	350	300	10	TO-39		2N5416	30	0.05/10	2.5	0.05/5
1	450	350	10	TO-39	2N3439		40	0.02/10	0.5	0.05/4
1.5	120	120	5	TO-39	BSW67		15	1/5	1	1/150
1.5	150	150	5	TO-39	BSW68		15	1/5	1	1/150
2	50	45	25	TO-126	BD375	BD376	40	0.15/2	1	1/100
2	75	60	25	TO-126	BD377	BD378	40	0.15/2	1	1/100
2	100	80	25	TO-126	BD379	BD380	40	0.15/2	1	1/100
3	250	150	10	TO-39	BU125S		30	0.25/3	1.5	0.5/50
3	200	200	25	TO-126	BU325		30	0.5/5	1.5	0.5/50
3	250	200	10	TO-39	BUY49S		40	0.5/5	0.2	0.5/50
3	40	40	6	TO-39		2N4234	30	0.25/1	0.6	1/125
5	100	60	5	TO-39	BFX34		40	2/2	1	5/500
5	65	60	5	TO-39		BSS44	40	2/2	1	5/500
5	150	80	7	TO-39	2N4897		40	2/2	1	5/500
5	100	80	11.7	TO-39	2N5154	2N5153	70	2.5/5	0.7	2.5/250
5	100	100	6	TO-39	2N5338		20	5/2	1.2	5/500
5	100	100	6	TO-39	2N5339		40	5/2	1.2	5/500
7	130	60	10	TO-39	BU125		15	5/2	1	5/500
7	100	60	10	TO-39	BUY68		40	1/1	1	5/500
7	150	120	10	TO-39	BUY47		15	5/5	1	5/500
7	330	—	60	TO-220	BU407D		8	5/1	1	5/650
7	330	150	60	TO-220	BU407		10	5/1	1	5/500
7	200	170	10	TO-39	BUY48		15	5/5	1	5/500
7	400	—	60	TO-220	BU406D		8	5/1	1	5/650
7	400	200	60	TO-220	BU406		10	5/1	1	5/500
7	400	200	50	TO-3	BUY18S		20	1/5	1	5/500
* 8	330	150	60	TO-220	BU807		100	5/2	1.5	5/50
* 8	400	200	60	TO-220	BU806		100	5/2	1.5	5/50

* Darlington types.

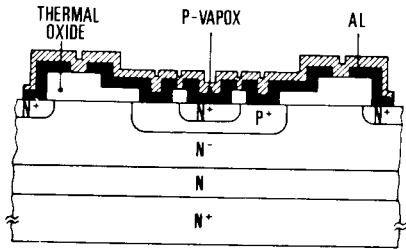
POWER TRANSISTORS & DARLINGTONS



LOW & MEDIUM VOLTAGE FAST SWITCHING, HIGH RUGGEDNESS

MULTIEPITAXIAL PLANAR – I_{CM} 1 to 70A, V_{CEO} 75 to 450V

- I_C range up to 70A
- Good h_{FE} linearity
- Very low leakage
- High switching speed
- High $E_{s/b}$ capability
- Totale base-collector passivation



MULTIEPITAXIAL PLANAR

I_C (A)	V_{CBO} (V)	V_{CEO} (V)	P_{tot} (W)	Package	NPN	h_{FE} min	I_C/V_{CE} (A/V)	V_{CEsat} max (V)	I_C/I_B (A/mA)
1	350	250	40	TO-220	TIP47	10	1/10	1	1/200
1	400	300	40	TO-220	TIP48	10	1/10	1	1/200
1	450	350	40	TO-220	TIP49	10	1/10	1	1/200
1	500	400	40	TO-220	TIP50	10	1/10	1	1/200
1.5	600	300	40	TO-126	MJE13002	5	1/2	1	1/250
1.5	700	400	40	TO-126	MJE13003	5	1/2	1	1/250
* 2.5	600	400	36	TO-126	BU801	100	1/3	2.2	1/15
3	250	200	15	TO-126	BUY49P	40	0.5/5	0.2	0.5/50
4	40	30	30	TO-220	D44C1/2/3	25/100/40	0.2/1	0.5	1/100/50/50
4	55	45	30	TO-220	D44C4/5/6	25/100/40	0.2/1	0.5	1/100/50/50
4	70	60	30	TO-220	D44C7/8/9	25/100/40	0.2/1	0.5	1/100/50/50
4	90	80	30	TO-220	D44C10/11/12	25/100/40	0.2/1	0.5	1/100/50/50
4	200	125	31	TO-220	D44Q1	20	2/10	1	2/200
4	250	175	31	TO-220	D44Q3	20	2/10	1	2/200
4	300	225	31	TO-220	D44Q5	20	2/10	1	2/200
* 6	400	350	60	TO-220	BU910	20	4/1.8	1.8	2.5/50
* 6	450	400	60	TO-220	BU911	20	4/1.8	1.8	2.5/50
* 6	500	450	60	TO-220	BU912	20	4/1.8	1.8	2/50
* 7	140	90	50	TO-220	2N6702	20	5/2	0.8	5/500
* 7	600	400	75	TO-220	BU810	100	2/2	3	7/700
10	30	30	50	TO-220	D44H1/2	20/40	4/1	1	8/800/400
10	45	45	50	TO-220	D44H4/5	20/40	4/1	1	8/800/400
10	60	60	50	TO-220	D44H7/8	20/40	4/1	1	8/800/400
10	80	80	50	TO-220	D44H10/11	20/40	4/1	1	8/800/400
10	100	80	60	TO-3	BDY91	20	10/5	0.5	5/500
10	120	100	60	TO-3	BDY90	20	10/5	0.5	5/500
10	150	120	140	TO-3	2N6354	20	5/2	0.5	5/500
* 10	400	350	105	SOT-93	BU920P	50	7/1.8	1.8	5/50
* 10	450	400	105	SOT-93	BU921P	50	7/1.8	1.8	5/50
* 10	500	450	105	SOT-93	BU922P	50	7/1.8	1.8	5/50

*Darlington types

POWER TRANSISTORS & DARLINGTONS



MULTIEPITAXIAL PLANAR (continued)

I _C (A)	V _{CB0} (V)	V _{CEO} (V)	P _{tot} (W)	Package	NPN	@		@	
						h _{FE} min	I _C /V _{CE} (A/V)	V _{CEsat} max (V)	I _C /I _B (A/mA)
12	300	250	120	TO-3	BUX42	8	6/4	1.2	4/400
15	150	110	140	TO-3	2N6496	12	8/2	1	8/800
15	250	200	120	TO-3	BUX41	8	8/4	1.2	5/500
* 15	400	350	105	SOT-93	BU930P	40	10/1.8	1.8	8/100
* 15	450	400	105	SQT-93	BU931P	40	10/1.8	1.8	8/100
* 15	500	450	105	SOT-93	BU932P	53	8/1.8	1.8	8/150
* 15	400	350	150	TO-3	BU930	100	7/1.6	1.8	10/250
* 15	450	400	150	TO-3	BU931	100	7/1.6	1.8	10/250
* 15	500	450	150	TO-3	BU932	53	8/1.8	1.8	8/450
* 16	450	350	175	TO-3	SGS10004	10	16/5	1.8	8/400
* 16	500	400	175	TO-3	SGS10005	10	16/5	1.8	8/400
* 16	450	350	150	SOT-93	SGS10004P	10	16/5	1.8	8/400
* 16	500	400	150	SOT-93	SGS10005P	10	16/5	1.8	8/400
18	220	160	120	TO-3	BUX41N	8	12/4	1.2	8/800
20	120	75	140	TO-3	2N5039	20	10/5	1	10/1000
20	150	90	140	TO-3	2N5038	20	12/5	1	12/1200
20	160	125	120	TO-3	BUX40	8	15/4	1.2	10/1000
20	220	160	150	TO-3	BUX11N	10	15/4	0.6	8/800
20	250	200	150	TO-3	BUX11	10	12/4	0.6	6/600
20	300	250	150	TO-3	BUX12	10	10/4	1	5/500
* 20	400	350	175	TO-3	MJ10004	50	5/5	1.9	10/400
* 20	450	400	175	TO-3	MJ10005	50	5/5	1.9	10/400
* 20	400	350	150	SOT-93	MJ10004P	50	5/5	1.9	10/400
* 20	450	400	150	SOT-93	MJ10005P	50	5/5	1.9	10/400
25	120	80	175	TO-3	BDY57	20	10/4	1.4	10/1000
25	160	125	175	TO-3	BDY58	20	10/4	1.4	10/1000
25	160	125	150	TO-3	BUX10	10	20/4	0.6	10/1000
30	120	90	140	TO-3	2N5671	20	20/5	0.75	15/1200
30	150	120	140	TO-3	2N5672	20	20/5	0.75	15/1200
40	150	120	140	TO-3 (M)	2N6033	10	40/2	1	40/4000
40	250	200	250	TO-3 (M)	BUV21	10	25/4	0.6	12/1200
40	300	250	250	TO-3 (M)	BUV22	10	20/4	1	10/1000
50	120	90	140	TO-3 (M)	2N6032	10	50/2.6	1.3	50/5000
50	160	125	250	TO-3 (M)	BUV20	10	50/4	0.6	25/2500
60	300	200	350	TO-3 (M)	BUR51	15	50/4	1	30/2000
60	350	250	350	TO-3 (M)	BUR52	15	40/4	1.8	25/2000
70	200	125	350	TO-3 (M)	BUR50	15	50/4	1	35/2000

* Darlington types

(M) Modified TO-3 with 1-5 mm pins

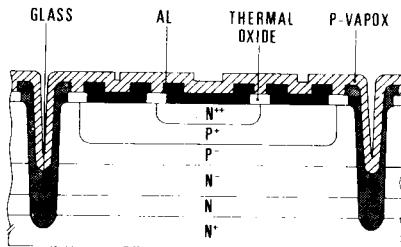
POWER TRANSISTORS



HIGH VOLTAGE FAST SWITCHING

MULTIEPITAXIAL MESA — I_{CM} 4 to 30A; V_{CEO} 325 to 600V

NPN and PNP types
 High voltage (V_{CBO} up to 1000V)
 High power
 Very good $I_{s/b}$ and $E_{s/b}$ performance
 High switching speed
 High f_T (20 MHz)
 Good stability



MULTIEPITAXIAL MESA

I_C (A)	V_{CBO} (V)	V_{CEO} (V)	P_{tot} (W)	Package	NPN	PNP	@		@	
							h_{FE} min	I_C/V_{CE} (A/V)	V_{CEsat} max (V)	I_C/I_B (A/mA)
2	800	400	40	TO-220	BUX84		5	1/3	1.5	0.3/30
2	800	400	40	TO-220	BUX84A		5	1/3	0.8	0.3/30
3	350	250	100	SOT-93	TIP51		5	3/1.5	1.5	3/600
3	400	300	100	SOT-93	TIP52		5	3/1.5	1.5	3/600
3	450	350	100	SOT-93	TIP53		5	3/1.5	1.5	3/600
3	500	400	100	SOT-93	TIP54		5	3/1.5	1.5	3/600
4	700	400	75	TO-220	MJE13005		10	1/5	0.6	2/500
5	850	400	85	TO-220	BUV46		5	3.5/5	1.5	2.5/500
5	850	400	100	SOT-93	BUV11		5	3/1.5	1.5	3/600
6	400	350	75	TO-3		BUW22	12	0.5/5	1.5	2.5/1000
6	450	400	75	TO-3		BUW22A	12	0.5/5	1.5	2.5/1000
6	400	350	65	TO-220		BUW22P	12	0.5/5	1.5	2.5/1000
6	450	400	65	TO-220		BUW22AP	12	0.5/5	1.5	2.5/1000
6	800	375	75	TO-3	BU326		25 •	1/5	1.5	2.5/500
6	800	375	113	SOT-93	BU426		25 •	0.6/5	1.5	2.5/500
6	800	400	60**	TO-3	BU326S		3.5	4/5	1.5	2.5/500
6	900	400	75	TO-3	BU326A		25 •	1/5	1.5	2.5/500
6	900	400	113	SOT-93	BU426A		25 •	0.6/5	1.5	2.5/500
8	450	400	120	TO-3	BUX44		8	4/4	1.5	4/800
8	700	400	80	TO-220	MJE13007		8	2/5	1.5	5/1000
8	850	400	125	TO-3	2N6545		4	8/5	1.5	5/1000
8	850	400	125	SOT-93	BUW12		5	6/1.5	1.5	6/1200
8	1000	450	125	SOT-93	BUW12A		5	6/1.5	1.5	6/1200
8.5	850	400	107	TO-3	BUX47		3	9/3	1.5	6/1200
9	850	400	120	SOT-93	BUV47		3.2	8/3	1.5	5/1000
9	1000	450	120	SOT-93	BUV47A		3.2	8/3	1.5	5/1000

• Typical

•• $T_{case} = 75^\circ C$

POWER TRANSISTORS



MULTIEPITAXIAL MESA (continued)

I_C (A)	V_{CBO} (V)	V_{CEO} (V)	P_{tot} (W)	Package	NPN	PNP	@		@	
							h_{FE} min	I_C/V_{CE} (A/V)	V_{CEsat} max (V)	I_C/I_B (A/mA)
10	450	450	125	TO-3		BUW32A	12	1/5	1.5	5/1500
10	400	350	105	SOT-93		BUW32P	12	1/5	1.5	5/1500
10	400	350	125	TO-3		BUW32	12	1/5	1.5	5/1500
10	450	400	105	SOT-93		BUW32AP	12	1/5	1.5	5/1500
10	400	325	120	TO-3	BUX43		8	5/4	2	5/1000
10	800	325	100	TO-3	BUY69B		15	2.5/10	3.3	8/2500
10	500	400	125	TO-3	BUW34		15	1/5	1.5	5/1000
10	800	400	125	TO-3	BUW35		15	1/5	1.5	5/1000
10	450	400	150	TO-3	BUX14		8	6/4	1.6	6/1200
10	800	400	100	TO-3	BUX80		5	5/1.5	1.5	5/1000
10	1000	400	100	TO-3	BUY69A		15	2.5/10	3.3	8/2500
10	900	450	125	TO-3	BUW36		15	1/5	1.5	5/1000
10	1000	450	100	TO-3	BUX81		3.2	8/3	3	8/2500
15	400	350	150	TO-3		BUW42	12	3/5	1.5	10/3000
15	450	400	150	TO-3		BUW42A	12	3/5	1.5	10/3000
15	400	350	125	SOT-93		BUW42P	12	3/5	1.5	10/3000
15	450	400	125	SOT-93		BUW42AP	12	3/5	1.5	10/3000
15	400	325	150	TO-3	BUX13		8	8/4	1.5	8/1600
15	500	400	175	TO-3	BUW44		6	6/1.5	3	10/2000
15	800	400	175	TO-3	BUW45		7	7/1.5	1.5	10/2000
15	^{850/450} 400	400	175	TO-3	BUX48		5	15/3	1.5	10/2000
15	850	400	175	TO-3	2N6547		5	15/5	1.5	10/2000
15	900	450	175	TO-3	BUW46		7	7/1.5	1.5	10/2000
15	1000	450	175	TO-3	BUX48A		5	12/3	1.5	8/1600
15	1000	600	175	TO-3	BUX48B		5	6/1.5	2	8/2500
15	1000	700	175	TO-3	BUX48C		4	6/1.5	2	8/2500
15	500	500	250	TO-3	BUV25		8	8/4	1	8/1600
15	850	400	150	SOT-93	BUV48		5	15/5	5	15/3000
15	1000	450	150	SOT-93	BUV48A		5	12/5	5	12/2400
15	1000	600	150	SOT-93	BUV48B		4	6/1.5	2	8/2500
15	1000	700	150	SOT-93	BUV48C		4	6/1.5	2	8/2500
20	450	400	250	TO-3		BUV24	8	12/4	1	12/2400
30	400	325	250	TO-3		BUV23	8	16/4	1	16/3200
30	850	400	250	TO-3		BUX98	5	20/1.5	1.5	20/4000
30	1000	450	250	TO-3		BUX98A	4.8	24/5	5	24/5000
30	1000	600	250	TO-3		BUX98B	2.5	20/3	3	20/8000
30	1000	700	250	TO-3		BUX98C	2.5	20/3	3	20/8000

POWER TRANSISTORS



HIGH VOLTAGE POWER MOS FAST SWITCHING

N-CHANNEL POWER MOS

Type	PACKAGE	$V_{(BR) DSS}$ (V)	$I_{D \max}$ (cont) (A)	$R_{DS(on) \max}$ (Ω)	P_{tot} (W)	$G_{fs \min}$ (S)	$C_{iss \max}$ (pF)
SGSP322	TO-220	50	10	0.15	75	3	550
SGSP422	SOT-93	50	10	0.15	75	3	550
SGSP522	TO-3	50	10	0.15	75	3	550
SGSP321	TO-220	60	10	0.15	75	3	550
SGSP421	SOT-93	60	10	0.15	75	3	550
SGSP521	TO-3	60	10	0.15	75	3	550
SGSP102	TO-39	80	1	2	15	0.45	70
SGSP152	TO-39	80	5	0.6	15	1.8	270
SGSP202	SOT-32	80	1	2	18	0.45	70
SGSP302	TO-220	80	1	2	18	0.45	70
SGSP312	TO-220	80	7	0.3	75	2.5	470
SGSP352	TO-220	80	5	0.6	50	1.8	270
SGSP512	TO-3	80	7	0.3	75	2.5	470
SGSP101	TO-39	100	1	2	15	0.45	70
SGSP151	TO-39	100	5	0.6	15	1.8	270
SGSP201	SOT-32	100	1	2	18	0.45	70
SGSP301	TO-220	100	1	2	18	0.45	70
SGSP311	TO-220	100	7	0.3	75	2.5	470
SGSP351	TO-220	100	5	0.6	50	1.8	270
SGSP511	TO-3	100	7	0.3	75	2.5	470
SGSP142	TO-39	350	0.2	36	15	0.14	60
SGSP332	TO-220	350	3	2.5	75	2.5	450
SGSP342	TO-220	350	0.2	36	18	0.14	60
SGSP532	TO-3	350	3	2.5	75	2.5	450
SGSP141	TO-39	400	0.2	36	15	0.14	60
SGSP331	TO-220	400	3	2.5	75	2.5	450
SGSP341	TO-220	400	0.2	36	18	0.14	60
SGSP531	TO-3	400	3	2.5	75	2.5	450

SMALL SIGNAL TRANSISTORS



SGS has a range of small signal silicon transistors optimized to cover the widest possible range while maintaining the high economy demanded by this market.

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SMALL SIGNAL TRANSISTORS



NPN GENERAL PURPOSE TRANSISTORS – TO-18

V_{CE0} V_{CER}^* (V)	h_{FE} @ I_C		Type	$V_{CE(sat)}$ @ I_C		f_T (MHz) min	t_s t_{off}^* (ns)	P_{tot} (mW)	ALSO AVAILABLE
	min/max	(mA)		(V) max	(mA)				
55	50/—	50	BSX33	0.3	150	60	800*	500	
25	75/260	100	BC377	0.7	500	300 typ.	—	375	
40	75/260	100	BC378	0.7	500	300 typ.	—	375	
30	100/300	150	2N2222	1.6	500	250	225	500	2N2221
40	100/300	150	2N2222A	1	500	250	225	500	2N2221A
50*	100/300	150	2N956	1.5	150	70	—	500	2N718A
55	60/180	150	BFR18	0.25	150	60	—	500	
80	40/—	150	2N720A	5	150	50	—	500	
80	100/300	150	2N3700	0.5	500	100 typ.	—	500	2N3302

NPN GENERAL PURPOSE TRANSISTORS – TO-39

V_{CE0} V_{CER}^* (V)	h_{FE} @ I_C		Type	$V_{CE(sat)}$ @ I_C		f_T (MHz) min	t_s t_{off}^* (ns)	P_{tot} (mW)	ALSO AVAILABLE
	min/max	(mA)		(V) max	(mA)				
40	40/250	100	BC140	0.35 typ.	500	50	850*	800	
60	40/250	100	BC141	0.35 typ.	500	50	850*	800	
30	40/—	150	BFY51	0.35	150	50	160 typ.	800	BFY52
30	100/300	150	2N2219	1.6	500	250	225	800	2N2218
35	30/—	150	BFY50	0.2	150	60	140 typ.	800	
40	50/250	150	2N3053	1.4	150	100 typ.	—	800	
40	100/300	150	2N2219A	1	500	250	225	800	2N2218A
50*	40/120	150	2N1613	1.5	150	60	—	800	
50*	100/300	150	2N1711	1.5	150	70	—	800	
55	40/120	150	BFY56A	0.25	150	60	800*	800	BFY56
60	40/240	150	BC301	0.5	150	120 typ.	—	800	BC302
60	40/120	150	2N3108	1.4	150	100 typ.	—	800	2N3110
60	100/300	150	2N3107	1.4	150	100 typ.	—	800	2N3109
65	40/120	150	2N2102	0.5	150	60	30*	1000	

SMALL SIGNAL TRANSISTORS



NPN GENERAL PURPOSE TRANSISTORS – TO-39 (continued)

V_{CE0} V_{CER}^* (V)	h_{FE} @ I_C		Type	$V_{CE(sat)}$ @ I_C		f_T (MHz) min	t_s t_{off}^* (ns)	P_{tot} (mW)	ALSO AVAILABLE
	min/max	(mA)		(V) max	(mA)				
80	40/240	150	BC300	0.5	150	120 typ.	—	800	BSY53
80	40/120	150	BSY55	0.6	150	100 typ.	—	800	
80	40/120	150	2N1893	5	150	50	—	800	
80	40/120	150	2N3020	0.5	500	80 typ.	—	800	
80	100/300	150	BSY56	0.6	150	100 typ.	—	800	
80	100/300	150	2N3019	0.5	500	100 typ.	—	800	
40	40/240	500	BC440	1	1000	50	—	1000	
50	40/250	500	2N5321	0.8	500	50	800*	1000	
60	40/240	500	BC441	1	1000	50	—	1000	
75	30/130	500	2N5320	0.5	500	50	800*	1000	

PNP GENERAL PURPOSE TRANSISTORS – TO-18

V_{CE0} (V)	h_{FE} @ I_C		Type	$V_{CE(sat)}$ @ I_C/I_B		f_T (MHz) min	t_s t_{off}^* (ns)	P_{tot} (mW)	ALSO AVAILABLE
	min/max	(mA)		(V) max	(mA)				
30	90/—	10	BFX48	0.3	50/5	400	160*	360	2N3250
40	50/—	10	BCY70	0.5	50/5	250	350	350	
40	100/300	10	2N3251	0.5	50/5	300	200	360	
40	150/300	10	2N4035	0.3	50/5	450	150*	360	
45	100/600	10	BCY71	0.5	50/5	200	—	350	
40	100/300	150	2N2907	0.4	150/15	200	80	400	2N3505 2N2906
45	100/300	150	2N3504	0.4	150/15	200	40	400	
60	40/120	150	2N2906A	0.4	150/15	200	80	400	
60	100/300	150	2N2907A	0.4	150/15	200	80	400	

SMALL SIGNAL TRANSISTORS



PNP GENERAL PURPOSE TRANSISTORS – TO-39

V_{CEO} (V)	h_{FE} @ I_C		Type	$V_{CE(sat)}$ @ I_C/I_B		f_T (MHz) min	t_s t_{off}^* (ns)	P_{tot} (mW)	ALSO AVAILABLE
	min/max	(mA)		(V) max	(mA)				
55	.85/—	100	BFX38	0.5	500/50	100	350	800	BFX39
75	40/—	100	BFX41	0.5	500/50	100	350	800	
75	85/—	100	BFX40	0.5	500/50	100	350	800	
80	100/300	100	2N4033	0.5	500/50	150	350	800	
									2N4031/2
40	50/250	150	2N4037	0.3	150/15	100	110	700	BC304 2N2904
40	100/230	150	2N2905	0.4	150/15	200	80	600	
60	40/240	150	BC303	0.65	150/15	75	—	850	
60	40/120	150	2N2904A	0.4	150/15	200	80	600	
60	100/300	150	2N2905A	0.4	150/15	200	80	600	
65	40/140	150	2N4036	0.65	150/15	60	700*	1000	
40	40/250	500	BC460	1	1000/100	50	—	1000	2N5323
60	40/250	500	BC461	1	1000/100	50	—	1000	
75	30/130	500	2N5322	0.7	500/50	50	1000*	1000	

NPN TRANSISTORS FOR LOW LEVEL, LOW NOISE APPLICATIONS – TO-18

V_{CEO} (V)	h_{FE} @ I_C		Type	$V_{CE(sat)}$ @ I_C/I_B		f_T (MHz) min	NF (dB)	P_{tot} (mW)	ALSO AVAILABLE
	min/max	(mA)		(V) max	(mA)				
45	100/500	0.01	2N930	1	10/0.5	30	3	300	2N2483
60	100/500	0.01	2N2484	0.35	1/0.1	60	3	360	
60	130/—	0.01	BFR17	0.35	1/0.1	70	3	360	
60	150/300	1	BFY76	0.35	1/01	100	4	360	
20	110/800*	2	BC108	0.6	100/5	100	10	300	BCY58
20	200/800*	2	BC109	0.6	100/5	100	4	300	
45	110/450*	2	BC107	0.6	100/5	100	10	300	
45	120/630	2	BCY59	0.7	100/2.5	100	6	360	

* h_{fe} @ 1 KHz.

SMALL SIGNAL TRANSISTORS

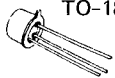
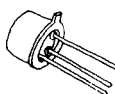
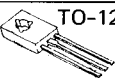


PNP TRANSISTORS FOR LOW LEVEL, LOW NOISE APPLICATIONS – TO-18

V_{CE0} (V)	h_{FE} @ I_C		Type	$V_{CE(sat)}$ @ I_C/I_B		f_T (MHz) min	NF (dB)	P_{tot} (mW)	ALSO AVAILABLE
	min/max	(mA)		(V) max	(mA)				
45	250/500	0.01	2N3964	0.25	10/0.5	50	2	360	2N3965
80	70/230	0.01	BFX37	0.4	50/5	40	3.5	360	
80	100/300	0.01	2N3963	0.25	10/0.5	40	3	360	2N3962
25	125/500*	2	BC178	0.25	50/5	200 typ.	10	300	BC179
45	120/460	2	BCY79	0.8	100/2.5	180 typ.	6	390	BCY78
45	125/500*	2	BC177	0.25	50/5	200 typ.	10	300	
50	110/450	2	BC478	0.25	50/5	150 typ.	6	360	BC479
80	110/250	2	BC477	0.25	50/5	150 typ.	10	360	

* h_{FE} @ 1 KHz.

HIGH VOLTAGE TRANSISTORS

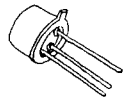
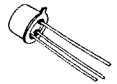
Polarity	V_{CE0} (V)	h_{FE} @ I_C min/max	I_C (mA)	Type	$V_{CE(sat)}$ @ I_C/I_B (V) max	I_C/I_B (mA)	f_T (MHz) min	P_{tot} (mW)	PACKAGE
PNP	150	40/–	10	BFW43	0.5	10/1	60	400	 TO-18
NPN	180	30/–	10	BC394	0.3	10/1	50	400	
PNP	180	50/–	10	BC393	0.3	10/1	50	400	
NPN	200	40/–	30	BSS72S	0.5	50/5	200	500	 TO-39
PNP	200	40/250	30	BSS75S	0.4	30/3	200	500	
PNP	150	40/–	10	BFW44	0.5	10/1	60	700	
PNP	180	80/300	10	BFX91	0.25	10/1	40	700	
PNP	180	80/300	10	2N3931	0.25	10/1	60	700	
PNP	200	30/150	10	2N5415S	2.5	50/5	15	1000	
NPN	250	25/–	30	BF258	1	30/6	90 typ.	1000	
NPN	150	30/–	30	2N3114	1	50/5	40	800	
NPN	250	30/–	30	BF458	1	50/10	90 typ.	1250	 TO-126
NPN	300	30/–	30	BF459	1	50/10	90 typ.	1250	

SMALL SIGNAL TRANSISTORS



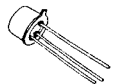
NPN TRANSISTORS FOR FAST AND ULTRA FAST SWITCHES

V_{CE0} (V)	h_{FE} min/max	@ I_C (mA)	Type	$V_{CE(sat)}$ @ I_C/I_B		f_T (MHz) min	t_s t_{off}^* (ns)	P_{tot} (mW)	PACKAGE
				(V) max	(mA)				
12	30/120	10	BSX28	0.25	30/3	400	13	360	TO-18
15	30/120	10	2N708	0.4	10/1	300	75*	360	
15	30/120	10	2N914	0.7	200/20	300	20	360	
15	40/120	10	BSX20	0.6	100/10	450	13	360	
15	40/120	10	2N2369	0.25	10/1	500	13	360	
15	40/120	10	2N2369A	0.2	10/1	500	13	360	
15	30/120	30	BSX26	0.5	300/30	350	18	360	
20	30/120	30	2N3014	0.18	100/10	350	18	360	TO-18
20	40/120	30	BSX39	0.28	100/10	350	18	360	
15	25/-	100	2N3013	0.5	300/30	350	18	360	
30	60/150	100	2N4013	0.20	100/10	300	60*	500	
30	30/120	150	2N2845	0.4	150/15	350	40*	360	
40	60/150	100	BSX32	0.5	500/50	300	60*	800	TO-39
50	60/150	100	2N3725	0.52	500/50	300	60*	800	



PNP TRANSISTORS FOR FAST AND ULTRA FAST SWITCHES

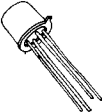
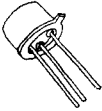
V_{CE0} (V)	h_{FE} min/max	@ I_C (mA)	Type	$V_{CE(sat)}$ @ I_C/I_B		f_T (MHz) min	t_{off} (ns)	P_{tot} (mW)	PACKAGE
				(V) max	(mA)				
12	30/120	30	BSX29	0.2	30/3	400	90	360	TO-18
12	40/120	30	2N2894	0.2	100/10	400	90	360	
20	30/120	30	2N3209	0.2	30/3	400	90	360	



SMALL SIGNAL TRANSISTORS



TRANSISTORS FOR RF APPLICATIONS (For current production or maintenance only)

Polar.	Max. ratings		Type	Main function	Trans. freq.		Noise figure			Gain		PACKAGE
	V _{CEO} (V)	I _C (mA)			f _T (MHz)	@ I _C (mA)	NF and I _C (dB) (mA)	f (MHz)	P _G (dB)	f (MHz)		
PNP	35	20	BF272S	VHF/UHF amp.	900	3	3	3	800	16	800	
PNP	35	20	BF316A	VHF/UHF osc.	600	3	5	3	800	12	800	
PNP	35	20	BFR38	VHF/UBF amp.	1000	3	3.5	3	800	14	800	
NPN	25	25	BF271	IF amplifier	900	10	—	—	—	24	36	
NPN	30	25	BFY90	Wide-band amp.	1400	25	5.5	2	800	8	800	
NPN	12	50	2N5179	VHF amplifier	1400	5	3	1.5	200	21	200	
NPN	15	50	2N918	UHF oscillator	900	4	5	1	60	21	200	
NPN	25	150	BFW16A	Wide-band amp.	1200	150	5	30	200	6.5	800	
NPN	30	200	BFR36	VHF/UHF amp.	1400	70	4.5	70	200	16	200	
NPN	20	400	2N5109	Wide-band amp.	1500	50	3	10	200	13	200	
NPN	20	500	2N4427	VHF/UHF amp.	800	50	—	—	—	—	—	
NPN	30	500	2N3866	VHF/UHF amp.	800	50	—	—	—	—	—	