

## 2.3 RF Bipolar transistors

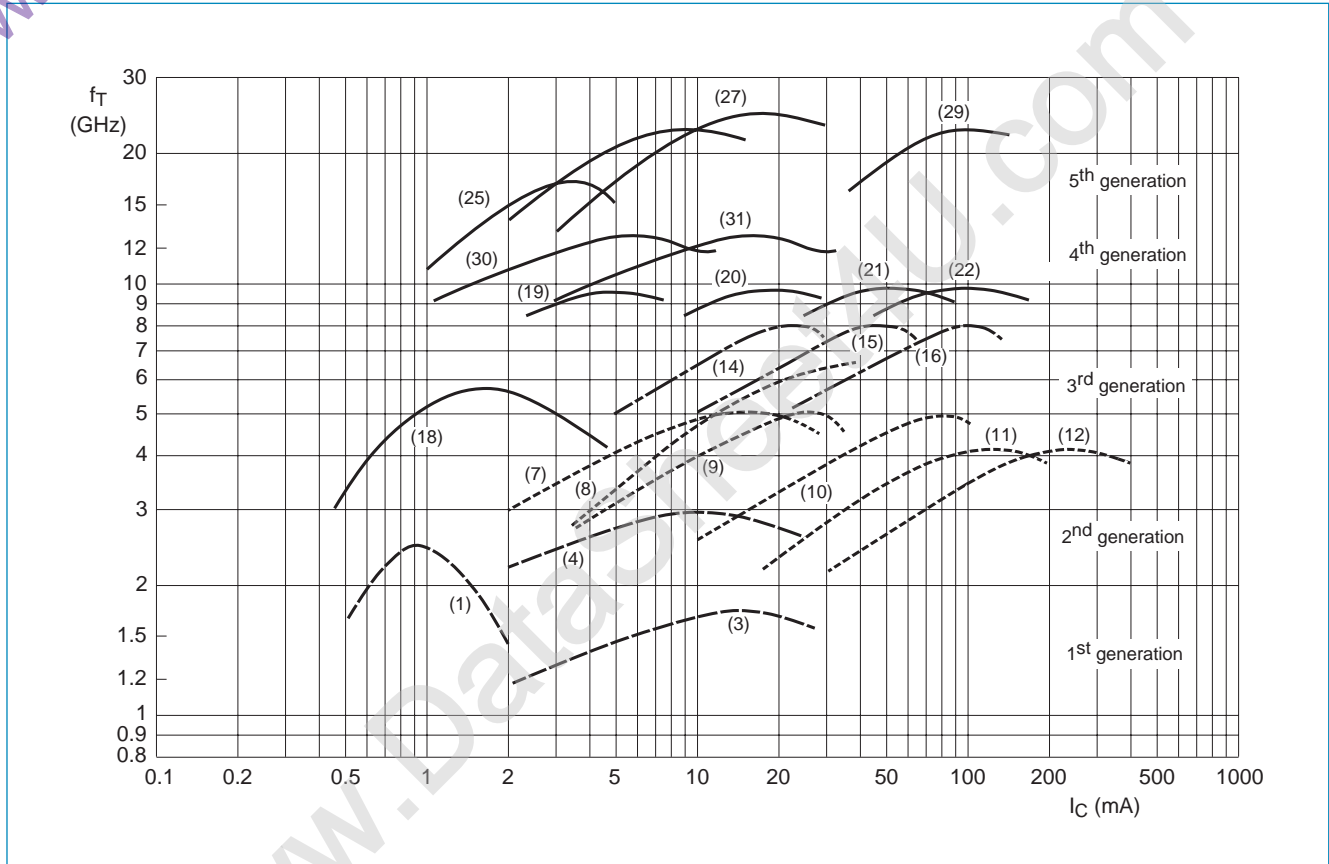
### 2.3.1 Wideband transistors

#### RF wideband transistors:

[http://www.semiconductors.philips.com/markets/mms/products/discretes/key\\_solutions/multimarket/transistors/25\\_45ghz\\_wideband/index.html](http://www.semiconductors.philips.com/markets/mms/products/discretes/key_solutions/multimarket/transistors/25_45ghz_wideband/index.html)

#### Wideband transistors

The  $f_T$ - $I_C$  curve represents Transition Frequency ( $f_T$ ) characteristics as a function of collector current ( $I_C$ ) for the six generations of RF wideband transistors. A group of transistors having the same collector current ( $I_C$ ) & similar transition frequencies ( $f_T$ ) represents a curve. The curve number matches products in the table, detailing their RF characteristics.



#### Wideband transistors (RF small signal)

Type	Curve	Package	$f_T$	$V_{ce0}$	$I_C$	$P_{tot}$	Polarity	Gum (dB)	F (dB)	@ (MHz)	Gum (dB)	F (dB)	@ (MHz)	$V_o$ (mV)	PI (dBm)	ITO (dBm)	@ $I_C$ & (mA)	$V_{ce}$ (V)
			(GHz)	(V)	(mA)	(mW)												
BFG10(X)	-	SOT143	-	8	250	250	NPN	-	-	-	7	-	1900	-	-	-	-	-
BFG10W/X	-	SOT343	-	10	250	400	NPN	-	-	-	7	-	1900	-	-	-	-	-
BLT80	-	SOT223	-	10	250	2000	NPN	>6	-	900	-	-	-	-	-	-	-	-
BLT81	-	SOT223	-	9.5	500	2000	NPN	>6.5	-	900	-	-	-	-	-	-	-	-
BLT50	-	SOT223	-	10	500	2000	NPN	>7	-	900	-	-	-	-	-	-	-	-
BLT70	-	SOT223	-	8	250	2100	NPN	>6	-	900	-	-	-	-	-	-	-	-
PMBHT10	-	SOT23	0.65	25	40	400	NPN	-	-	-	-	-	-	-	-	-	-	-
BFS17	3	SOT23	1	15	25	300	NPN	-	4.5	500	-	-	-	-	-	-	-	-
BFS17W	3	SOT323	1.6	15	50	300	NPN	-	4.5	500	-	-	-	-	-	-	-	-
BFT25	1	SOT23	2.3	5	6.5	30	NPN	18	3.8	500	12	-	800	-	-	-	-	-
BFS17A	4	SOT23	2.8	15	25	300	NPN	13.5	2.5	800	-	-	-	150	-	-	14	10
BFG35	11	SOT223	4	18	150	1000	NPN	15	-	500	11	-	800	750	-	-	100	10
BFQ18	11	SOT89	4	18	150	1000	NPN	-	-	-	-	-	-	-	-	-	-	-

■ = New

Wideband transistors (RF small signal)

Type	Curve	Package	F <sub>c</sub>	V <sub>ceo</sub>	I <sub>c</sub>	P <sub>tot</sub>	Polarity	Gum (dB)	F (dB)	@ (MHz)	Gum (dB)	F (dB)	@ (MHz)	V <sub>o</sub> (mV)	PI (dBm)	ITO (dBm)	@ I <sub>c</sub> & (mA)	V <sub>ce</sub> (V)	
			(GHz)	(V)	(mA)	(mW)													
			Typical	Maximum values															
BFG34/01	11	SOT122	4	18	150	2700	NPN	16.3	8	500	-	-	-	1200	26	45	120	15	
BFG68	12	SOT122	4	18	300	4500	NPN	13	-	800	-	-	1600	1600	28	47	240	15	
BFG25A/X	18	SOT143	5	5	6.5	32	NPN	18	1.8	1000	-	-	-	-	-	-	-	-	
BFG25W(X)	18	SOT343	5	5	6.5	500	NPN	16	2	1000	8	-	2000	-	-	-	-	-	
BFG31	10	SOT223	5	15	100	1000	PNP	16	-	500	12	-	800	550	-	-	70	10	
BFG590(X)	22	SOT143	5	15	200	400	NPN	13	-	900	7.5	-	2000	-	-	-	-	-	
BFG590W(X)	22	SOT343	5	15	200	500	NPN	13	-	900	7.5	-	2000	-	21	-	80	5	
BFG92A(X)	7	SOT143	5	15	25	400	NPN	16	2	1000	11	3	2000	-	-	-	-	-	
BFG149	10	SOT89	5	15	100	1000	PNP	12	3.75	500	-	-	-	-	-	-	-	-	
BFR106	10	SOT23	5	15	100	500	NPN	11.5	3.5	800	-	-	-	350	-	-	50	9	
BFR92A	7	SOT23	5	15	25	300	NPN	14	2.1	1000	8	3	2000	150	-	-	14	10	
BFR92AW	7	SOT323	5	15	25	300	NPN	14	2	1000	-	3	2000	-	-	-	-	-	
BFR93AW	8	SOT323	5	12	35	300	NPN	13	1.5	1000	8	2.1	2000	-	-	-	-	-	
BFS25A	18	SOT323	5	5	6.5	32	NPN	13	1.8	1000	-	-	-	-	-	-	-	-	
BFT25A	18	SOT23	5	5	6.5	32	NPN	15	1.8	1000	-	-	-	-	-	-	-	-	
BFT92	7	SOT23	5	15	25	300	PNP	18	2.5	500	-	-	-	150	-	-	14	10	
BFT92W	7	SOT323	5	15	35	300	PNP	17	2.5	500	11	3	1000	-	-	-	-	-	
BFT93	9	SOT23	5	12	35	300	PNP	16.5	2.4	500	-	-	-	300	-	-	30	5	
BFT93W	9	SOT323	5	12	50	300	PNP	15.5	2.4	500	10	3	1000	-	-	-	-	-	
BFG97	10	SOT223	5.5	15	100	1000	NPN	16	-	500	12	-	800	700	-	-	70	10	
BFG19	10	SOT89	5.5	15	100	1000	NPN	11.5	3.3	500	7.5	-	800	-	-	-	-	-	
BFG93A(X)	8	SOT143	6	12	35	300	NPN	16	1.7	1000	10	2.3	2000	-	-	-	-	-	
BFG94	8	SOT223	6	12	60	700	NPN	-	2.7	500	13.5	3	1000	500	21.5	34	45	10	
BFR93A	8	SOT23	6	12	35	300	NPN	13	1.9	1000	-	3	2000	425	-	-	30	8	
BFG135	16	SOT223	7	15	150	1000	NPN	16	-	500	12	-	800	850	-	-	100	10	
BFG591	22	SOT223	7	15	200	2000	NPN	13	-	900	7.5	-	2000	-	-	-	-	-	
BFG591	22	SOT89	7	15	200	2000	NPN	13	-	900	7.5	-	2000	-	-	-	-	-	
BFG198	15	SOT223	8	10	100	1000	NPN	18	-	500	15	-	800	700	-	-	70	8	
BFG67(X)	14	SOT143	8	10	50	380	NPN	17	1.7	1000	10	2.5	2000	-	-	-	-	-	
BFG67	14	SOT23	8	10	50	300	NPN	14	1.7	1000	8	2.7	2000	-	-	-	-	-	
BFG67W	14	SOT323	8	10	50	300	NPN	13	2	1000	8	2.7	2000	-	-	-	-	-	
PBR941	-	SOT23	8	10	50	360	NPN	15	1.4	1000	9.5	2	2000	-	-	-	-	-	
PBR951	-	SOT23	8	10	100	365	NPN	14	1.3	1000	8	2	2000	-	-	-	-	-	
PRF947	-	SOT323	8.5	10	50	250	NPN	16	1.5	1000	10	2.1	2000	-	-	-	-	-	
PRF957	-	SOT323	8.5	10	100	270	NPN	15	1.3	1000	9.2	1.8	2000	-	-	-	-	-	
BFG505(X)	19	SOT143	9	15	18	150	NPN	20	1.6	900	13	1.9	2000	-	4	10	5	6	
BFG520(X)	20	SOT143	9	15	70	300	NPN	19	1.6	900	13	1.9	2000	275	17	26	20	6	
BFG520W(X)	20	SOT343	9	15	70	500	NPN	17	1.6	900	11	1.85	2000	275	17	26	20	6	
BFG540(X)	21	SOT143	9	15	120	500	NPN	18	1.9	900	11	2.1	2000	500	21	34	40	8	
BFG540W(X)	21	SOT343	9	15	120	500	NPN	16	1.9	900	10	2.1	2000	500	21	34	40	8	
BFG541	21	SOT223	9	15	120	650	NPN	15	1.9	900	9	2.1	2000	500	21	34	40	8	
BFM505	19	SOT363	9	8	18	500	NPN	17	1.4	900	10	1.9	2000	-	-	-	-	-	
BFM520	20	SOT363	9	8	70	1000	NPN	15	1.7	900	9	1.9	2000	-	-	-	-	-	
BFG540	21	SOT89	9	12	120	1200	NPN	-	1.9	900	-	-	-	500	-	-	40	8	
BFR505	19	SOT23	9	15	18	150	NPN	17	1.6	900	10	1.9	2000	-	4	10	5	6	
BFR505T	19	SOT416	9	-	18	150	NPN	17	1.2	900	-	-	-	-	-	-	-	-	
BFR520	20	SOT23	9	15	70	300	NPN	15	1.6	900	9	1.9	2000	-	17	26	20	6	
BFR520T	20	SOT416	9	-	70	150	NPN	15	1.6	900	9	1.9	2000	-	17	26	-	-	
BFR540	21	SOT23	9	15	120	500	NPN	14	1.9	900	7	2.1	2000	550	21	34	40	8	
BFS505	19	SOT323	9	15	18	150	NPN	17	1.6	900	10	1.9	2000	-	4	10	5	6	
BFS520	20	SOT323	9	15	70	300	NPN	15	1.6	900	9	1.9	2000	-	17	26	20	6	
BFS540	21	SOT323	9	15	120	500	NPN	14	1.9	900	8	2.1	2000	-	21	34	40	8	
PRF949	-	SOT416	9	10	50	150	NPN	16	1.5	1000	-	-	-	-	-	-	-	-	
BFG310W/XR	30	SOT343XR	14	6	10	60	NPN	18	1.1	1000	-	-	-	-	1.8	8	5	3	
BFG310/XR	30	SOT143XR	14	6	10	60	NPN	18	1.1	1000	-	-	-	-	1.8	8	5	3	
BFG325W/XR	31	SOT343XR	14	6	35	210	NPN	18	1.1	3000	-	-	-	-	8.7	19	15	3	
BFG325/XR	31	SOT143XR	14	6	35	210	NPN	18	1.1	3000	-	-	-	-	8.7	19	15	3	
BFG403W	25	SOT343	17	4.5	3.6	16	NPN	-	1	900	-	1.6	2000	-	5	6	1	1	
BFG21W	21	SOT343	18	4.5	200	600	NPN	-	-	-	10	-	1900	-	-	-	-	-	
BFG480W	29	SOT343	21	4.5	250	360	NPN	-	1.2	900	-	1.8	2000	-	-	28	80	2	
BFG410W	26	SOT343	22	4.5	12	54	NPN	-	0.9	900	-	1.2	2000	-	5	15	10	2	
BFG424F	27	SOT343F	25	4.5	30	135	NPN	-	0.8	900	-	1.2	2000	-	12	22	25	2	
BFG424W	27	SOT343	25	4.5	30	135	NPN	-	0.8	900	-	1.2	2000	-	12	22	25	2	
BFG425W	27	SOT343	25	4.5	30	135	NPN	-	0.8	900	-	1.2	2000	-	12	22	25	2	

■ = New