

Surface Mount Transistors



Low Level Amplifiers—NPN

Type No.	Case Style	V <sub>CE0</sub> (V)		V <sub>BE0</sub> (V)	I <sub>CES</sub> (mA)	I <sub>C</sub> & V <sub>CE</sub> (V)	V <sub>CE(SAT)</sub> (V)		V <sub>BE(SAT)</sub> (V)		C <sub>ob</sub> (pF)	f <sub>T</sub> (MHz)		NF (dB) Max	Test Conditions	Process No.
		Min	Max				Min	Max	Min	Max		Min	Max			
MMBT 930	TO-236 (49)	45	45	5	10	5	1.0	0.6	1.0	10	8	30	0.5	3	(Note 1)	11
						5										
MMBT 930A	TO-236 (49)	60	45	6	2	5	0.5	0.7	0.9	10	6	45	0.05	3	(Note 5)	11
						5										
MMBT 2484	TO-236 (49)	60	60	6	10	5	0.35			1	10	15	0.05	3	(Note 1)	11
						5										
MMBT 3117	TO-236 (49)	60	60	6	10	5	0.35			1	4.5	60	0.5	1	(Note 2)	11
						5										
MMBT 3565	TO-236 (49)	30	25	6	50	10	0.35			1	4	40	240			11
						5										
MMBT 4409	TO-236 (49)	80	50	5	10	1	0.2			0.8	12	60	300			11
						1										
MMBT 4410	TO-236 (49)	120	80	5	10	1	0.2			0.8	12	60	300			11
						1										
MMBT 5088	TO-236 (49)	35	30		50	5	0.5			10	4			3	(Note 3)	11
						5										
MMBT 5089	TO-236 (49)	30	25		50	5	0.5			10	4			2	(Note 3)	11
						5										

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## Low Level Amplifiers—NPN (Continued)

Type No.	Case Style	V <sub>CE0</sub> (V)		V <sub>BE0</sub> (V)	I <sub>CBO</sub> (nA) @ V <sub>CB</sub> Max	h <sub>FE</sub> @ I <sub>C</sub> & V <sub>CE</sub> (V)		V <sub>CE(SAT)</sub> (V)		V <sub>BE(SAT)</sub> (V) @ I <sub>C</sub> (mA)		C <sub>ob</sub> (pF) Max	f <sub>T</sub> (MHz) @ I <sub>C</sub> (mA)		NF (dB) Max	Test Conditions	Process No.
		Min	Max			Min	Max	Min	Max	Min	Max		Min	Max			
MMBT 5133	TO-236 (49)	20	18	3	50	15	5	60	1000	1	5	5					11
MMBT 5209	TO-236 (49)	50	50		50	35	5	150	10	5	5	4	30	0.5	4	(Note 5)	11
MMBT 5210	TO-236 (49)	50	50		50	35	5	100	300	0.1	5	4	30	0.5	3	(Note 4)	11
MMBT 5961	TO-236 (49)	60	60	8	2	45	5	100	0.01	5	0.2	6	100	10	6	(Notes 7, 11)	11
MMBT 5962	TO-236 (49)	45	45	8	2	30	5	450	0.01	5	0.2	6	100	10	6	(Notes 7, 11)	11

**TEST CONDITIONS:**

Note 1: I<sub>C</sub> = 10 μA, V<sub>CE</sub> = 8V, f = 10 Hz - 16.7 kHz  
 Note 2: I<sub>C</sub> = 10 μA, V<sub>CE</sub> = 5V, f = 1 kHz  
 Note 3: I<sub>C</sub> = 5 μA, V<sub>CE</sub> = 5V, f = 1 kHz  
 Note 4: I<sub>C</sub> = 100 μA, V<sub>CE</sub> = 5V, f = 10 Hz - 15.7 kHz

Note 5: I<sub>C</sub> = 10 μA, V<sub>CE</sub> = 5V, f = 10 kHz  
 Note 6: I<sub>C</sub> = 100 μA, V<sub>CE</sub> = 6V, f = 5 kHz  
 Note 7: I<sub>C</sub> = 100 μA, V<sub>CE</sub> = 5V, f = 1 kHz, R<sub>S</sub> = 1 kΩ  
 Note 8: I<sub>C</sub> = 100 μA, V<sub>CE</sub> = 5V, f = 1 kHz, R<sub>S</sub> = 10 kΩ

Note 9: I<sub>C</sub> = 100 μA, V<sub>CE</sub> = 5V, f = 1 kHz, R<sub>S</sub> = 100 kΩ  
 Note 10: I<sub>C</sub> = 10 μA, V<sub>CE</sub> = 5V, f = 1 kHz, R<sub>S</sub> = 10 kΩ  
 Note 11: I<sub>C</sub>/I<sub>B</sub> = 20

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