

Surface Mount Devices



Surface Mount Transistors

General Purpose Amplifiers and Switches—PNP

Type No.	Case Style	V _{CB0} * (V) Min	V _{CEO} (V) Min	V _{EB0} (V) Min	ICES* ICBO @ (V) (nA) Max	h _{FE} @ Ic & VCE Min Max (mA) (V)	V _{CE(SAT)} (V) Max	V _{BE(SAT)} (V) Min	Ic (mA) Max	f _T (MHz) Min Max	t _{off} (ns) Max	NF (dB) Max	Test Conditions	Process No.
MMBT 2904	TO-236 (49)	60	40	5	20	30 500 100 300 75 10 50 1 35 0.1	0.4	1.3	150	200	50			63
MMBT 2904A	TO-236 (49)	60	40	5	10	50 500 100 300 100 10 100 1 75 0.1	0.4	1.3	150	200	50		(Note 2)	63
MMBT 2905	TO-236 (49)	60	40	5	20	30 500 100 300 75 10 50 1 35 0.1	0.4	1.3	150	200	50			63
MMBT 2905A	TO-236 (49)	60	40	5	10	50 500 100 300 100 10 100 1 75 0.1	0.4	1.3	150	200	50		(Note 2)	63
MMBT 2906	TO-236 (49)	60	40	5	20	30 500 100 300 75 10 50 1 35 0.1	0.4	1.3	150	200	50			63
MMBT 2906A	TO-236 (49)	60	40	5	10	50 500 100 300 75 10 50 1 35 0.1	0.4	1.3	150	200	500		(Note 2)	63

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Type No.	Case Style	V _{CB0} * (V) Min	V _{CE0} (V) Min	V _{EB0} (V) Min	I _{CS} * I _{CB0} (nA) Max	I _{FE} @ I _C & V _{CE} (mA) Min Max	V _{CE(SAT)} (V) Max	V _{BE(SAT)} (V) Min Max	I _C (mA) Min Max	C _{ob} (pF) Max	f _T (MHz) Min Max	t _{off} (ns) Max	NF (dB) Max	Test Conditions	Process No.
MMBT 2907	TO-236 (49)	60	40	5	20 50	30 500 100 300 75 150 50 10 35 0.1	0.4	1.3 150	200 50	8	200				63
MMBT 2907A	TO-236 (49)	60	40	5	10 50	50 500 100 300 100 10 100 1 75 0.1	0.4	1.3 150	200 50	8	200		100	(Note 2)	63
MMBT 3638	TO-236 (49)	25	25	4	35* 15	20 10 30 50 20 300	0.25	1.1 50	100 50	20	100	170		(Notes 1, 18)	63
MMBT 3638A	TO-236 (49)	25	25	4	35* 15	100 10 80 1 100 50 20 300	0.25	1.1 50	150 50	10	150	170		(Notes 1, 18)	63
MMBT 3644	TO-236 (49)	45	45	5	35* 30	40 0.1 80 1 100 10 80 240 100 300 20 300	0.25	1.0 50	200 20	35	200	100		(Notes 4, 18)	63
MMBT 3645	TO-236 (49)	60	60	5	35* 50	40 0.1 80 1 100 10 80 240 100 300 20 300	0.25	1.0 50	200 20	35	200	100		(Notes 4, 18)	63

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Type No.	Case Style	V _{CE0} [*] (V) Min	V _{CE0} (V) Min	V _{EB0} (V) Min	I _{CE0} [*] (mA) Max	V _{CB} (V) Min	I _{FE} @ I _C & V _{CE} (mA) Min Max	V _{CE(SAT)} (V) Max	V _{BE(SAT)} (V) Min Max	I _C (mA) Min Max	C _{ob} (pF) Max	f _T (MHz) Min Max	t _{off} (ns) Max	NF (dB) Max	Test Conditions	Process No.
MMBT 3702	TO-236 (49)	40	25	5	100	20	60 300 50 5	0.25		50	12	100	50			63
MMBT 3703	TO-236 (49)	50	30	5	100	20	30 150 50 5	0.25		50	12	100	50			63
MMBT 4402	TO-236 (49)	40	40	5			20 500 2 50 150 2 50 10 1 30 1 1	0.4 0.75 0.95 1.3	0.75	150 20 255	8.5	150	20 255		(Note 4)	63
MMBT 4403	TO-236 (49)	40	40	5			20 500 2 100 300 150 2 100 10 1 60 1 1 30 0.1 1	0.4 0.75 0.95 1.3	0.75	150 20 255	8.5	200	20 255		(Note 4)	63
MMBT 5142	TO-236 (49)	20	20	4	50*	12	15 300 10 30 50 1	0.5 2.0	1.5 2.5	50 300	10	100	50 200		(Note 1)	63*
MMBT 5143	TO-236 (49)	20	20	4	50*	12	15 300 10 30 50 1	0.5 2.0	1.5 2.5	50 300	10	100	50 200		(Note 1)	63
MMBT 5226	TO-236 (49)	25	25	4	300	15	30 600 50 10 25 10 10	0.8	1.0	100 20	20	50	20			63
MMBT 6502	TO-236 (49)	60	40	5	20	50	35 0.1 10 50 1 10 75 10 10 100 300 150 10 30 500 10	0.4		150 50 300	8	200	50			63

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Type No.	Case Style	V _{CB0} [*] (V) Min	V _{CEO} (V) Min	V _{EB0} (V) Min	I _{CES} [*] I _{CB0} @ (nA) Max	h _{FE} @ I _C & V _{CE} (mA) (V) Min Max	V _{CE(SAT)} (V) Max	V _{BE(SAT)} (V) Min Max	I _C (mA) Min Max	C _{ob} (pF) Max	f _T (MHz) @ I _C Min Max	t _{off} (ns) Max	NF (dB) Max	Test Conditions	Process No.
MMBT 3251	TO-236 (49)	50	40	5		30 50 100 300 80 0.1 90 0.001	0.25 0.5	0.6 0.9 1.2 50	10 10	6	300 200		6	(Note 6)	66
MMBT 3905	TO-236 (49)	40	40	5		30 0.1 40 1 50 10 30 50 15 100	0.25 0.4	0.65 0.85 0.95 50	10 10	4.5	200		5	(Note 8)	66
MMBT 3906	TO-236 (49)	40	40	5		60 0.1 80 1 100 300 60 50 30 100	0.25 0.4	0.65 0.85 0.95 50	10 10	4.5	200		4	(Note 8)	66
MMBT 4121	TO-236 (49)	40	40	5	25° 30	15 50 70 200 60 1 40 0.1	0.13 0.14 0.3	0.75 1 0.7 0.9 1.1 50	10 10	4.5	400	150	4	(Notes 8, 11)	66
MMBT 4122	TO-236 (49)	40	40	5	25° 30	30 50 150 300 150 1 100 0.1	0.13 0.14 0.3	0.75 1 0.7 0.9 1.1 50	10 10	4.5	200		5	(Note 8)	66

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Type No.	Case Style	V _{CB0} [*] (V) Min	V _{CE0} [*] (V) Min	V _{EB0} [*] (V) Min	I _{CS} [*] I _{CB0} (nA) Max	V _{CB} (V) Max	I _{FE} @ I _C & V _{CE} (mA) Min Max	V _{CE(SAT)} (V) Max	V _{BE(SAT)} (V) Min Max	I _C (mA) Max	C _{ob} (pF) Max	f _T (MHz) Min Max	t _{off} (ns) Max	NF (dB) Max	Test Conditions	Process No.
MMBT 4125	TO-236 (49)	25	25	4	50	20	25 60	1 2	0.4	0.95	4.5	200	10	4	(Note 8)	66
MMBT 4126	TO-236 (49)	25	25	4	50	20	60 120	1 300	0.4	0.95	4.5	250	10	4	(Note 8)	66
MMBT 4916	TO-236 (49)	30	30	5	25*	15	15 70	50 10	0.13	0.75	4.5	400	10	4	(Notes 8, 13)	66
MMBT 4917	TO-236 (49)	30	30	5	25*	15	60 40	1 0.1	0.14 0.3	0.7 0.75	4.5	150	10	4	(Notes 8, 13)	66
MMBT 5138	TO-236 (49)	30	30	5	50*	20	50 50	10 1	0.2 0.5	0.7 0.75	5	300	10		(Note 13)	66
MMBT 5139	TO-236 (49)	20	20	5	50*	15	15 40	50 10	0.2	0.7	5	300	10		(Note 13)	66
MMBT 6518	TO-236 (49)	40	40	4	50	30	30 90	2 0.1	0.5	0.75	4	50	50			66
MMBT 4354	TO-236 (49)	60	60	5	50	5	25 40	0.1 1	0.15	0.8	30	100	500	3	(Notes 8, 14)	67
							50 40	100 10	0.5	1.1		500				

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Type No.	Case Style	V _{CE0} [•] (V) Min	V _{CE0} (V) Min	V _{EB0} (V) Min	ICES [•] I _{CB0} @ (nA) (V) Max	h _{FE} @ I _C & V _{CE} Min Max (mA) (V)	V _{CE} (SAT) (V) Max	V _{BE} (SAT) (V) Min Max	I _C (mA) Min Max	C _{ob} (pF) Max	f _T (MHz) @ I _C Min Max	t _{off} (ns) Max	NF (dB) Max	Test Conditions	Process No.
MMBT 4355	TO-236 (49)	60	60	5	50 50	75 500 10 75 100 10 100 400 10 75 1 10 60 0.1 10	0.15	0.9 150 1.1 500 1.2 1A	30 500 10 40 100 10 50 250 10 40 1 10 25 0.1 10	30	100 500 50	400	3	(Notes 8, 14)	67
MMBT 4356	TO-236 (49)	60	60	5	50 50	30 500 10 40 100 10 50 250 10 40 1 10 25 0.1 10	0.15	0.9 150 1.1 500 1.2 1A	30 500 10 40 100 10 50 250 10 40 1 10 25 0.1 10	30	100 500 50	400	3	(Notes 8, 14)	67
MMBT 5855	TO-236 (49)	60	60	5	100 40	50 10 10 50 300 150 10 50 500 10 15 1A 10	0.4	1.3 150 1.1 500	15 150	15	100 50				67
MMBT 5857	TO-236 (49)	80	80	5	100 60	50 10 10 50 300 150 10 50 500 10 15 1A 10	0.4	1.3 150 1.1 500	15 150	15	100 50			T-37-01 T-29-01	67
MMBT 6562	TO-236 (49)			5	100 20	50 200 500 1 50 100 1 35 10 1	0.5	500	30 30	30	60 10				67
MMBT A55	TO-236 (49)	60	60	4	100 60	50 10 1 50 100 1	0.25	100	50 100	50	50 100				67
MMBT A56	TO-236 (49)	80	80	4	100 80	50 10 1 50 100 1	0.25	100	50 100	50	50 100				67
MMBT 200	TO-236 (49)	60	45	6	50 50	80 0.1 1 100 450 10 1 100 100 1 100 350 150 5	0.2	0.85 10 1.0 200	6 6	6	250 20		4	(Note 8)	68

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Type No.	Case Style	V _{CE0} [*] (V) Min	V _{BE0} (V) Min	I _{CE0} [*] (nA) Max	I _{FE} @ I _C & V _{CE} (mA) Min Max	V _{CE(SAT)} (V) Max	V _{BE(SAT)} (V) Min Max	I _C (mA) Min Max	C _{ob} (pF) Max	f _T (MHz) Min Max	t _{off} (ns) Max	NF (dB) Max	Test Conditions	Process No.
MMBT 200A	TO-236 (49)	60	45	6	300 600 100 100 250 0.1	0.2	0.85 10 1.0 200	6	6	250	20			68
MMBT 201	TO-236 (49)	100	80	50*	60 0.1 75 375 50 100	0.2	0.85 10 1.0 100	4.5	100	100	10	4	(Note 8)	68
MMBT 3962	TO-236 (49)	60		10*	100 10 90 50	0.4	0.95 50	6	6					68
MMBT 4143	TO-236 (49)	60	40	6	30 500 60 150 100 300 75 100 60 10 25 0.1	0.4	1.3 150 2.6 500	8	200	200	50		(Note 12)	68
MMBT 4291	TO-236 (49)	40	30	6	100 300 50 10 30 0.1	0.4	1.5 100	10	10	100	10			68
MMBT 5447	TO-236 (49)	40	25	5	50 300 50 5	0.25	50	12	100	100	50			68

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Type No.	Case Style	V _{CE0} [*] (V) Min	V _{CE0} [*] (V) Min	V _{BE0} (V) Min	I _{CE0} [*] (mA) Max	I _{CE0} [*] (mA) Max	I _{FE} @ I _C & V _{CE} (mA) (V)	V _{CE(SAT)} (V) Max	V _{BE(SAT)} (V) Min	I _C @ I _C (mA) (mA)	C _{ob} (pF) Max	f _T (MHz) Min	f _T (MHz) Max	t _{off} (ns) Max	NF (dB) Max	Test Conditions	Process No.
MMBT 3467	(TO-236) (49)	40	40	5	100	30	40 1 5 40 100 500 1 40 150 1	0.3	1.0	150	25	175	50	90		(Note 4)	70
MMBT 4888	TO-236 (49)	150	150	6	50	100	30 1 10 40 400 10 10	0.5	0.8	1.2	4	30	160	1			74
MMBT 4889	TO-236 (49)	150	150	6	10	100	60 0.1 10 70 1 10 80 300 10 10	0.5		10	4	40	160	1		(Note 19) (Note 20) (Note 21) (Note 22) (Note 23)	74
MMBT 5400	TO-236 (49)	130	120	5	100	100	40 50 5 40 180 10 5 30 1 5	0.2	1.0	10	6	100	400	10		(Note 9)	74
MMBT 5401	TO-236 (49)	160	150	5	50	120	50 50 5 60 240 10 5 50 1 5	0.2	1.0	10	6	100	300	10		(Note 9)	74
MMBT L51	TO-236 (49)	100	100	4	1	50	40 250 50 5	0.25	1.2	10	8	60	10				74
MMBT H81	TO-236 (49)	20	20	3	100	10	60 5 10	0.5		5	0.85	600	5				75
MMBT A92	TO-236 (49)	300	300	5	250	200	25 1 10 40 10 10 25 30 10	0.5	0.9	20	6	50	10				76
MMBT A93	TO-236 (49)	200	200	5	250	160	25 1 10 40 10 10 25 150 30 10	0.5	0.9	20	8	50	10				76

TEST CONDITIONS:

Note 1: I_C = 300 mA, V_{CC} = 10V, I_B¹ = I_B² = 30 mA
 Note 2: I_C = 100 mA, V_{CC} = 5V, I_B¹ = I_B² = 15 mA
 Note 3: I_C = 300 mA, V_{CC} = 15V, I_B¹ = I_B² = 30 mA
 Note 4: I_C = 300 mA, V_{CC} = 30V, I_B¹ = I_B² = 30 mA
 Note 5: I_C = 10 mA, V_{CC} = 3V, I_B¹ = I_B² = 1 mA
 Note 6: I_C = 100 μA, V_{CE} = 5V, f = 100 Hz
 Note 7: I_C = 30 μA, V_{CE} = 5V, f = 1 kHz
 Note 8: I_C = 100 μA, V_{CE} = 5V, f = 1 kHz

Note 9: I_C = 250 μA, V_{CE} = 5V, f = 1 kHz
 Note 10: I_C = 10 μA, V_{CE} = 5V, f = 1 kHz
 Note 11: I_C = 50 mA, V_{CC} = 30V, I_B¹ = I_B² = 5 mA
 Note 12: I_C = 150 mA, V_{CC} = 30V, I_B¹ = I_B² = 15 mA
 Note 13: I_C = 50 mA, V_{CC} = 10V, I_B¹ = I_B² = 5 mA
 Note 14: I_C = 500 mA, V_{CC} = 30V, I_B¹ = I_B² = 50 mA
 Note 15: I_C = 100 μA, V_{CE} = 10V, f = 1 kHz
 Note 16: I_C = 200 μA, V_{CE} = 5V, f = 1 kHz

Note 17: I_C/I_B = 40
 Note 18: I_C/I_B = 20
 Note 19: I_C = 250 μA, V_{CE} = 5V, f = 10 Hz–10 kHz
 Note 20: I_C = 250 μA, V_{CE} = 5V, f = 100 Hz
 Note 21: I_C = 30 μA, V_{CE} = 5V, f = 1 kHz
 Note 22: I_C = 250 μA, V_{CE} = 5V, f = 10 kHz
 Note 23: I_C = 1 mA, V_{CE} = 10V, f = 1 MHz

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