



**National  
Semiconductor**

**RF Amplifiers and Oscillators**

Type No.	Case Style	V <sub>CE</sub> <sup>*</sup> V <sub>CBO</sub> (V) Min	V <sub>CE0</sub> (V) Min	V <sub>EB0</sub> (V) Min	I <sub>CBO</sub> (nA) Max	V <sub>CB</sub> (V) Max	h <sub>FE</sub>		I <sub>C</sub> & V <sub>CE</sub> (mA) & (V)	V <sub>CE(SAT)</sub> (V) & V <sub>BE(SAT)</sub> (V)		I <sub>C</sub> (mA)	C <sub>ob</sub> /C <sub>ro</sub> (pF)		f <sub>T</sub> (MHz)		NF (dB) Max	Freq (MHz) @ Max	Process No.	
							Min	Max		Min	Max		Min	Max	Min	Max				Min
2N2857	TO-72	30	15	2.5	10	15	30	150	3	1			1	1000	1800	5	4.5	450	40	
2N3478	TO-72	30	15	2	20	1	25	150	2	8			1	750	1600	5	4.5	200	40	
2N3600	TO-72	30	15	3	10	15	20	150	3	1			1	850	1500	5	4.5	200	40	
2N3932	TO-72	30	20	2.5	10	15	40	150	2	8			0.55	750	1600	2	4.5	200	40	
2N3933	TO-72	40	30	2.5	10	15	60	200	2	8			0.55	750	1600	2	4	200	40	
2N4259	TO-72	40	30	2.5	10	15	60	250	2	8			0.55	750	1600	2	5	450	40	
2N5179	TO-72	20	12	2.5	20	15	25	250	3	1	0.4	1.0	10	1	900	2000	5	4.5	200	40
2N5180	TO-72	30	15	2	500	8	20	200	2	8			1	650	1700	2			40	
MRF501	TO-72	25	15	3.5	50	1	30	250	1	6				600		5			40	
MRF502	TO-72	35	15	3.5	20	1	40	170	1	6				800		5			40	
PN5179	TO-92 (92)	20	15	2.5	2	15	25	250	3	1	0.4	1.0	10	1.0	900	2000	5	4.5	200	40
MPS6539	TO-92 (91)	20	20	3	50	15	20		4	10			0.7	500		4	4.5	100	42	
MPS6548	TO-92 (91)	30	25	3	100	25	25	4	10	10	0.5	0.95	4	0.7	650	4			42	
MPSH10	TO-92 (91)	30	25	3	100	25	60	4	10	10	0.5		4	0.35	650	4			42	
2N917	TO-72	30	15	3	1	15	20	3	1	1	0.5	0.87	3	3	500	4	6	60	43	
2N918	TO-72	30	15	3	10	15	20	3	1	1	0.4	1.0	10	3	600	4	6	60	43	
2N3563		Same as PN3563																		
2N3564		Same as PN3564																		
2N3662	TO-92 (94)	18	12	3	500	15	20	8	10	10			0.8	1.7	700	2100	5	6.5	60	43

# RF Amplifiers and Oscillators (Continued)

Type No.	Case Style	V <sub>CE0</sub> *		V <sub>EB0</sub> (V) Min	I <sub>CBO</sub> (nA) Max	h <sub>FE</sub>		I <sub>C</sub> & V <sub>CE</sub> (mA) (V)	V <sub>CE(SAT)</sub> (V) Max	V <sub>BE(SAT)</sub> (V) Min Max		I <sub>C</sub> (mA) Max	C <sub>ob</sub> /C <sub>ro</sub> (pF) Min Max	f <sub>T</sub> (MHz) Min Max		NF (dB) @ (MHz) Max	Process No.			
		V <sub>CB0</sub> (V) Min	V <sub>CE0</sub> (V) Min			Min	Max			Min	Max			Min	Max					
2N3663	TO-92 (94)	30	12	3	500	15	20	8	10			5	0.8	1.7	700	2100	6.5	60	43	
2N3825	TO-92 (94)	30	15	4	100	15	20	2	10	0.25		2	3.5		200	800	5.5	1	43	
2N4292	TO-92 (94)	30	15	3	500	15	20	3	1	0.6		10	3.5		600		6	60	43	
2N4293	TO-92 (94)	30	15	3	500	15	20	3	1	0.6		10	3.5		600		6	60	43	
2N5130		Same as PN5130																		
2N5770	TO-92 (92)	30	15	4.5	10	15	50	200	8	10	0.4	1.0	10	0.7	1.1	900	1800	6	60	43
MPS918	TO-92 (92)	30	12	3	10	15	20	3	1	0.4		10	3		600		6	60	43	
MPS3563		Same as PN3563																		
MPS6507	TO-92 (92)	30*	20		5	15	25	2	10				2.5		700	10			43	
MPS6511	TO-92 (92)	30*	20		50	15	25	10	10				2.5						43	
MPS6541	TO-92 (92)	30*	20	4	50	15	25	4	10				1.7		600	1500	4		43	
MPS5770	TO-92 (92)	30	15	4.5	10	15	50	200	8	1	0.4	1.0	10		800	1800	8		43	
PN918	TO-92 (92)	30	15	3	10	15	20	3	1	0.4		10	1.7		600		6	60	43	
PN3563	TO-92 (92)	30	15	2	50	15	20	200	8	10			1.7		600	1500	8		43	
PN3564	TO-92 (92)	30	15	4	50	15	20	500	15	10	0.3	0.97	20	3.5	400	1200	15		43	



NPN Transistors

RF Amplifiers and Oscillators (Continued)													
Type No.	Case Style	V <sub>CE</sub> * V <sub>CB0</sub> (V) Min	V <sub>CE0</sub> (V) Min	V <sub>EB0</sub> (V) Min	I <sub>CB0</sub> V <sub>CB</sub> (nA) @ (V) Max	h <sub>FE</sub> @ I <sub>C</sub> & V <sub>CE</sub> (mA) & (V) Min Max	V <sub>CE(SAT)</sub> (V) & V <sub>BE(SAT)</sub> (V) @ I <sub>C</sub> Max Min Max	C <sub>ob</sub> /C <sub>ro</sub> (pF) Min Max	f <sub>T</sub> (MHz) Min Max	I <sub>C</sub> (mA) Max	NF (dB) @ (MHz) Max	Process No.	
PN5130	TO-92 (92)	30	12	1	50 10	15 250 8 10	0.6 1.0 10	1.7	450	8		43	
2N4134	TO-72	30	30	3	50 10	25 200 4 5		0.5	350 800	4	2.5 60	44	
2N4135	TO-72	30	30	3	50 10	25 200 4 5		0.5	425 800	4	5 450	44	
MPS6568A	TO-92	20	20	3	50 10	20 200 4 5	0.3 0.96 10	0.65	375 800	4	3.3 200	44	
MPS6569	TO-92	20	20	3	50 10	20 200 4 5	3 0.96 10	0.25 0.5	300 800	4	6 45	44	
MPS6570	TO-92	20	20	3	50 10	20 200 4 5	3 0.96 10	0.25 0.5	300 800	4	6 45	44	
MPSH30	TO-92	20	20	3	50 10	20 200 4 5	0.3 0.96 10	0.65	300 800	4	6 45	44	
MPSH31	TO-92	20	20	3	50 10	20 200 4 5	0.3 0.96 10	0.65	300 800	4	6 45	44	
SE5020	TO-72	20	20	3	50 10	20 200 4 5	3.0 0.96 10	0.25 0.5	375 800	4	3.3 200	44	
SE5021	TO-72	20	20	3	50 10	20 200 4 5	3.0 0.96 10	0.25 0.5	375 800	4	4 200	44	
SE5022	TO-72	20	20	3	50 10	20 200 4 5	3.0 0.96 10	0.25 0.5	300 800	4		44	
SE5023	TO-72	20	20	3	50 10	20 200 4 5	3.0 0.96 10	0.25 0.5	300 800	4	6 45	44	
SE5024	TO-72	20	20	3	50 10	20 200 4 5	3.0 0.96 10	0.25 0.5	300 800	4	6 45	44	
SE5050	TO-72	20	20	3	50 10	20 200 4 5	3.0 0.96 10	0.25 0.5	300	4	4 100	44	
SE5051	TO-72	20	20	3	50 10	20 200 4 5	3.0 0.96 10	0.25 0.5	300	4		44	
SE5052	TO-72	20	20	3	50 10		3.0 10		375	4	4 200	44	
MPS6542	TO-92 (96)	30*	20		50 15	25 2 10		1.5	700	10		47	
MPS6543	TO-92 (96)	35	20	3	100 25	25 4 10	0.35 0.05 10	1	750	4		47	
MPS6546	TO-92 (96)	35	25	3	100 25	20 2 10	0.35 10	0.45	600	2		47	
MPS6547	TO-92 (96)	35	25	3	100 25	20 2 5	0.35 10	0.35	600	2		47	
MPSH11	TO-92 (96)	30	25	3	100 25	60 4 10	0.5 4	0.6 0.9	650 4			47	

## RF Amplifiers and Oscillators (Continued)

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		Min	Max				Min	Max		Min	Max		Min	Max			
MPSH19	TO-92 (96)	30	25	3	3	100	45	4	10			4	300	4			47
MPSH24	TO-92 (96)	40	30	4	4	50	30	8	10			8	400	8			47
MPSH34	TO-92 (96)	45	45	4	4	50	15 40	20 7	2 15	0.5		20	500	15			47
TIS86	TO-92 (96)	30	30			100	40	200	4	0.5		15	500	4	5	200	47
TIS87	TO-92 (96)	45	45			100	30	150	12	0.5		15	500	12			47
MPS6540	TO-92 (96)	30	30	4	4	100	25	2	10	0.5		10	350	2			49
MPS6544	TO-92 (96)	60	45	4	4	500	20	30	10	0.5		30	0.65				49
MPS6567	TO-92 (96)		40	5	5	500	25	10	5	0.5		10	0.7				49
MPSH20	TO-92 (96)	40	30	4	4	50	25	4	10		0.95	10	400	4			49
MPSH37	TO-92 (96)		40	5	5	500	25	5	10	0.5		10	0.7	300	5		49