

NPN Transistors



GENERAL PURPOSE AMPS AND SWITCHES (Continued)

Type No.	Case Style	VCBO (V)	VCEO (V)	VEBO (V)	ICBO (nA) @ VCB (V)	hFE @ IC & VCE (V)			VCE(SAT) (V) & VBE(SAT) (V) @ IC (mA)			Cob (pF) Max	fT (MHz) @ IC (mA)		toff (ns) Max	NF (dB) Max	Test Conditions	Process No.	
		Min	Min	Min		Min	Max	Min	Max	Max	Min		Max	Min					Max
2N3947	TO-18	60	40	6		40	50	1	0.2	0.6	0.9	10	4	300	10	450	5	6/7	23
						100	300	10	1	0.3	1.0	50							
						90	1	1	1										
						60	100 μ A	1											
2N4123	TO-92 (92)	40	30	5	50	20	25	50	1	0.3	0.95	50	4	250	10		6	7	23
2N4124	TO-92 (92)	30	25	5	50	20	60	50	1	0.3	0.95	50	4	300	10		5	7	23
							120	360	2	1									
MPS2711	TO-92 (92)	18	18	5	500	18	30	90	2	4.5			4						23
MPS2712	TO-92 (92)	18	18	5	500	18	75	225	2	4.5			4						23
MPS2716	TO-92 (92)	18	18	5	500	18	75	225	2	4.5			3.5						23
MPS2923	TO-92 (92)	25	25	5	500	25	90	180	2	10			12						23
								(1 kHz)											
MPS2924	TO-92 (92)	25	25	5	500	25	150	300	2	10			12						23
								(1 kHz)											
MPS2925	TO-92 (92)	25	25	5	500	25	235	470	2	10			12						23
								(1 kHz)											
MPS2926	TO-92 (92)	25	25	5	500	18	35	470	2	10			3.5						23
								(1 kHz)	(5 Groups)										
MPS3642	TO-92 (92)	Same as PN3642, see page 1-22 for explanation																23	
MPS3721	TO-92 (92)				500	18	60	660	2	10			3.5						23
								(1 kHz)											
MPS3826	TO-92 (92)	60	45	4	100	30	40	160	10	10			3.5	200	800	10			23
MPS3827	TO-92 (92)	60	45	4	100	30	100	400	10	10			3.5	200	800	10			23
MPS6512	TO-92 (92)	40	30	4	50	30	30	100	10	10	0.5		50	3.5					23
							50	100	2	10									
MPS6513	TO-92 (92)	40	30	4	50	30	60	100	10	10	0.5		50	3.5					23
							90	180	2	10									
MPS6514	TO-92 (92)	40	25	4	50	30	90	100	10	10	0.5		50	3.5					23
							150	300	2	10									
MPS6515	TO-92 (92)	40	25	4	50	30	150	100	10	10	0.5		50	3.5					23
							250	500	2	10									

Conversion of Bipolar Metal Can to Plastic

Metal P/N	Plastic Equivalent	Electrical Equivalency*	Process	Metal P/N	Plastic Equivalent	Electrical Equivalency*	Process
2N697	2N4400	A	13	2N2905	TN2905	E	63
2N706	MPS706	E	21	2N2905A	TN2905A	E	63
2N708	PN3646	N	22	2N2906	PN2906	E	63
2N718	2N4400	A	13	2N2906A	PN2906A	E	63
2N722	PN2906	N	63	2N2907	PN2907	E	63
2N744	PN2369	N	21	2N2907A	PN2907A	E	63
2N753	PN2369	N	21	2N3009	PN3646	N	22
2N760A	2N4409	N	07	2N3011	PN2369	N	21
2N834	MPS834	E	21	2N3012	PN3640	A	65
2N869A	PN3640	A	65	2N3013	PN3646	E	22
2N915	MPS6565	A	27	2N3019	TN3019	E	12
2N917	PN3563	E	43	2N3020	TN3020	E	12
2N918	PN918	E	43	2N3053	2N3053	E	12
2N929	2N4409	N	07	2N3117	2N5210	N	07
2N930	PN930	E	07	2N3133	MPS3703	N	63
2N956	PN2222A	N	19	2N3134	PN3645	N	63
2N995A	PN3640	A	65	2N3135	MPS3703	N	63
2N1132	PN2906	N	63	2N3136	PN3645	N	63
2N1613	PN2221A	N	19	2N3250	2N3905	A	66
2N1711	PN2222A	N	19	2N3251	2N3906	A	66
2N2218	TN2218	E	19	2N3300	2N4401	A	13
2N2218A	TN2218A	E	19	2N3301	2N4400	A	13
2N2219	TN2219	E	19	2N3302	2N4401	A	13
2N2219A	TN2219A	E	19	2N3304	PN3639	A	65
2N2221	PN2221	E	19	2N3440	TN3440	E	36
2N2221A	PN2221A	E	19	2N3724	TN3724	E	25
2N2222	PN2222	E	19	2N3725	TN3725	E	25
2N2222A	PN2222A	E	19	2N3944	2N3903	N	23
2N2369	PN2369	E	21	2N3947	2N3904	N	23
2N2369A	PN2369A	E	21	2N3962	2N5086	N	62
2N2483	2N5209	N	07	2N3964	2N5087	N	62
2N2484	2N5210	N	07	2N3965	2N5087	N	62
2N2604	2N5086	N	62	2N4033	TN4033	E	67
2N2605	2N5086	N	62	2N4036	TN4036	E	67
2N2894	PN3640	A	65	2N4037	TN4037	E	67
2N2894A	PN3639	A	65	2N4208	PN3640	N	65
2N2904	TN2904	E	63	2N4209	PN3640	N	65
2N2904A	TN2904A	E	63				

* E = Exact electrical equivalent

N = Near electrical equivalent

A = Approximate electrical equivalent

Note: On "N" and "A" categories please refer to device specification section for deviation from metal can specifications.

This list is for use when an alternative to a metal can transistor is needed.

To facilitate conversions on the most popular types National is offering the "PN" series, TO-92 devices that use the same die type and are screened to same electrical specifications. The TO-92 transistors produced by National Semiconductor are the most advanced Plastic Transistors ever manufactured. They utilize epoxy B encapsulation and a copper lead frame to give a power dissipation of up to 625 mW @ $T_A = 25^\circ\text{C}$. These transistors provide electrical performance and reliability equivalent to their metal can versions in most applications where T_J does not exceed 150°C .

The same situation is applicable to the "TN" series, except that the National-originated TO-237 (TO-92 +) case outline is used, which permits power dissipation of up to 1.0W @ $T_A = 25^\circ\text{C}$.