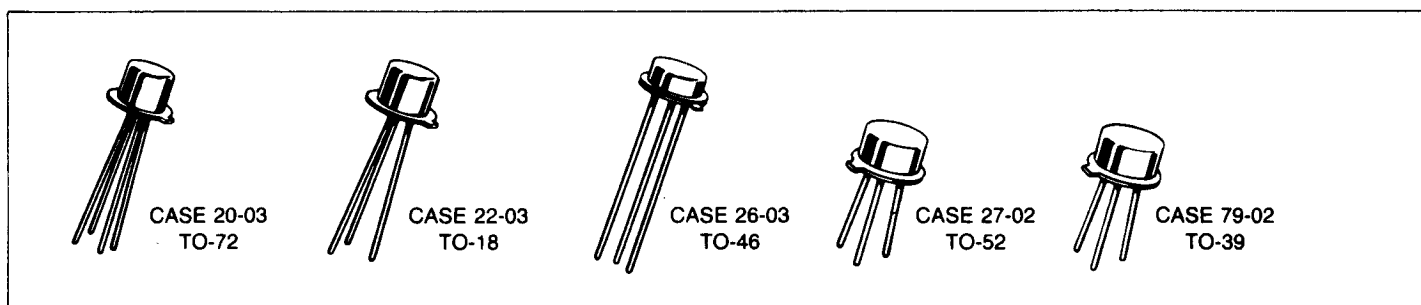


# Metal Small-Signal Transistors



Motorola Small-Signal Metal Can Transistors are designed for use as General-Purpose Amplifiers, High-Speed Switches, High-Voltage Amplifiers, Low-Level/Low-Noise Amplifiers, High-Frequency Oscillators, Choppers, and Darlington's. These devices are manufactured in a variety of packages, i.e., TO-18, TO-39, TO-46, TO-52, and TO-72.

The following selector guide tables also indicate those Motorola small-signal metal can transistors which are qualified under CECC 50000, and MIL-19500 high-reliability requirements. Devices are available to CECC Levels L, F and E (see qualified products Table page 26). JAN, JANTX, JANTXV and JANS versions as specified.

## Switching Transistors

The following devices are intended for use in general-purpose switching and amplifier applications. Within each package group shown, the devices are listed in order of decreasing turn-on time ( $t_{on}$ ).

Package	Device Type	$t_{on}$ & $t_{off}$ ns @ $I_C$			$V_{(BR)CEO}$ Volts Min	$I_C$ mA Max	$h_{FE}$ @ $I_C$		$V_{CE(sat)}$ Volts Max	$I_C$ @ $I_B$		$f_T$ MHz Min	$I_C$ mA	Comments
		Max	Max	mA			Min	mA		mA				

### NPN

TO-18	2N4014	35	60	500	50	1000	35	500	0.52	500	50	300	50	Exists under CECC Exists under CECC
	2N2369	12	18	100	15	500	20	100	0.25	10	1.0	500	10	
	2N2369A†	12	18	10	15	200	40	10	0.2	10	1.0	500	10	
	2N3227	12	18	100	20	50	30	100	0.25	10	1.0	500	10	
	BSX20	7	18	100	15	500	20	10	0.25	10	1.0	400	10	
TO-39	2N3735#	48	60	1000	50	1500	20	1000	0.5	500	50	250	50	
	2N3506#	45	90	1500	40	3000	40	1500	1.0	1500	150	60	100	
	BSX60	40	70	500	30	1000	30	500	0.5	500	50	—	—	
	2N3725	35	60	500	50	2000	35	500	0.52	500	50	300	50	
	BSX59	35	60	500	45	1000	25	500	0.5	500	50	—	—	
2N3724	35	60	500	30	2000	35	500	0.42	500	50	300	50		
TO-46	2N3737#	48	60	1000	50	1500	20	1000	0.5	500	50	250	50	

### PNP

TO-18	2N2894	60	90	30	12	200	40	30	0.2	30	3.0	400	30	Exists under CECC
	2N3546	40	30	50	12		25	50	0.25	50	5.0	700	10	
	2N4208	15	20	10	12	200	30	10	0.15	10	1.0	700	10	
	2N4209	15	20	10	15	50	40	50	0.6	50	5.0	850	10	
TO-39	2N3635#	400	600	50	140	1000	100	50	0.5	50	5.0	200	30	Exists under CECC
	2N4036	110	700	150	65	1000	40	150	0.65	150	15	60	50	
	2N4033#	100	240	500	80	1000	25	1000	0.5	500	50	150	50	
			(typ)											
	2N4407	75	225	1000	80	1500	30	1000	0.7	1000	100	150	50	
	2N3244	50	185	500	40	1000	50	500	0.5	500	50	175	50	
	2N3467#	40	90	500	40	100	40	500	0.5	500	50	175	50	
	2N3762#	43	115	1000	40	1500	30	1000	0.9	1000	100	180	50	
2N4405**	40	210	500	80	1000	50	500	0.5	500	50	200	50		

JAN available

\*\*JAN/JANTX available

†JAN/JANTX/JANTXV/JANS available

# JAN/JANTX/JANTXV available

## METAL SMALL-SIGNAL TRANSISTORS (continued)

### High-Voltage/High-Current Amplifiers (continued)

The following table lists Motorola standard devices that have high Collector-Emitter Breakdown Voltage. Devices are listed in decreasing order of  $V_{(BR)CEO}$  within each package type.

Package	Device Type	$V_{(BR)CEO}$ Volts Min	$I_C$ mA Max	$h_{FE}$ Min	$\alpha$   $I_C$ mA	$V_{CE(sat)}$ Volts Max	$\alpha$   $I_C$ mA	&   $I_B$ mA	$f_T$ MHz Min	$\alpha$   $I_C$ mA	Comments
<b>NPN</b>											
TO-39	BUY49S	200	3000	40	500	0.2	500	50	—	—	Exists under CECC
	BF257	160	100	25	30	1.0	30	6	110	30	
	BSW68A	150	2000	30	500	1.0	500	150	—	—	
	2N3114	150	200	30	30	1.0	50	5.0	40	30	
	2N3501#	150	300	100	150	0.4	150	15	150	20	
	BSW67A	120	2000	30	500	1.0	500	150	—	—	
	2N5682	120	1000	40	250	0.6	250	25	30	100	
	MM3007	100	2500	50	250	0.35	150	15	50	50	
	2N5681	100	1000	40	250	0.6	250	25	30	100	
	2N4239	80	3000	30	250	0.3	500	50	2	100	
	MM3005	60	2500	50	150	0.35	150	15	50	50	
	2N4237	40	3000	30	250	0.3	500	50	2	100	

### PNP

TO-18	BSS76	300	500	35	30	0.5	50	5.0	100	20	
	BSS75	250	500	35	30	0.5	50	5.0	100	20	
	BSS74	200	500	35	30	0.5	50	5.0	100	20	
	BC393	180	500	50	10	0.3	10	1.0	50	20	
	2N3497	120	100	40	10	0.35	10	1.0	150	20	
TO-39	2N5416#	300	1000	30	50	2.5	50	5	15	10	Exists under CECC
	MM4003	250	500	20	10	5.0	10	1.0	—	—	Exists under CECC
	2N5415#	200	1000	30	50	2.5	50	5	15	10	
	2N3637#	175	1000	100	50	0.5	50	5.0	200	30	
	MM4001	150	500	20	10	0.6	10	1.0	—	—	
	2N3635#	140	1000	100	50	0.5	50	5.0	200	30	
	2N3634#	140	1000	50	50	0.5	50	5.0	150	30	
	2N3495	120	100	40	10	0.35	10	1.0	150	20	
	2N5680	120	1000	40	250	0.6	250	15	30	100	
	MM4000	100	100	20	10	0.6	10	1.0	—	—	
	MM5007	100	2000	50	250	0.5	150	15	30	50	
	2N5679	100	1000	40	250	0.6	250	25	30	100	
	2N4236	80	3000	30	250	0.6	1000	125	3	100	
	2N4036	65	1000	40	150	0.65	150	15	60	50	
	MM5005	60	2000	50	150	0.5	150	15	30	50	
	2N4235	60	3000	30	250	0.6	1000	125	3	100	
	2N4234	40	3000	30	250	0.6	1000	125	3	100	

# JAN, JANTX, JANTXV available