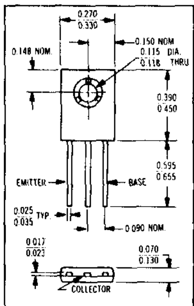
PLASTIC SILICON POWER TRANSISTORS — SHORT-FORM SPECIFICATIONS



CASE 77

TYPE NPN PNP*	I_C	P_D	V_{CEO}	h_{FE}	@ I_C	$V_{CE(sat)}$	@ I_C	& I_B	f_T
	AMP(max)	W (max)	Volts (max)	Min/Max	Amp	Volts (max)	Amp	Amp	MHz
MJE340	0.5	20.8	300	30/240	0.05	-	-	-	10
2N4918*	3.0	30	40	20/100	0.5	0.6	1.0	0.1	3.0
2N4919*	↓	↓	60	↓	↓	↓	↓	↓	↓
2N4920*	↓	↓	80	↓	↓	↓	↓	↓	↓
2N4921	↓	↓	40	↓	↓	↓	↓	↓	↓
2N4922	↓	↓	60	↓	↓	↓	↓	↓	↓
2N4923	↓	↓	80	↓	↓	↓	↓	↓	↓

PLASTIC SILICON SMALL-SIGNAL TRANSISTORS

Common Specifications. All plastic small-signal transistors included in this section have the following characteristics in common:

$P_D = 310$ mW @ $T_A = 25°C$
Derate at 2.81 mW/°C
Operating Junction Temperature, $T_J = 135°C$
Storage Temperature Range, $T_{stg} = -55°C$ to $+135°C$
Thermal Resistance, Junction to Ambient, $\theta_{JA} = 0.357°C/mW$

PACKAGE DESCRIPTION

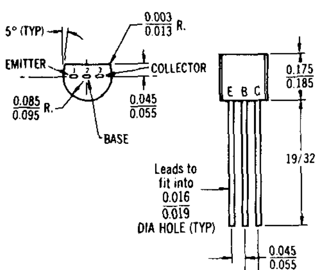
Unibloc plastic transistors are supplied in three case styles to meet a wide variety of requirements.

Case 29 (1) — used for all amplifier devices designed for low to medium frequency applications. This style lends itself to economical lead forming to the standard TO-5 and TO-18 lead configuration.

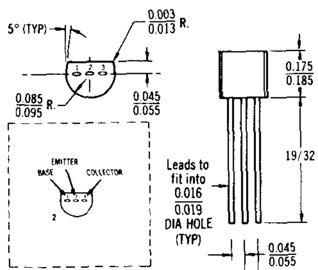
Case 29 (2) — a case style leading to good RF amplifier performance due to very low internal device feedback capacitance. The "emitter-in-the-center" lead configuration isolates the collector and base leads, drastically reducing the net capacitance between these leads and providing a substantial reduction in the collector-to-base feedback.

Case 29A — utilizes case style (2) and includes a unique metal shield. This shield, when properly grounded in the circuit, further reduces the effective feedback capacitance and provides an effective shield from RF radiation.

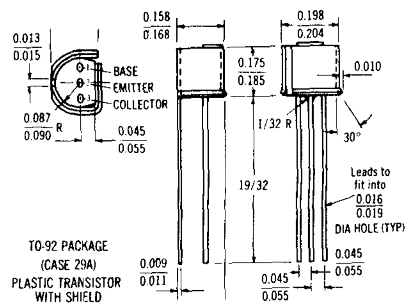
This packaging concept, a first, yields plastic transistors with performance equal to that achieved previously only with metal can devices.



TO-92 (CASE 29) (1)

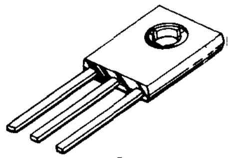


TO-92 (CASE 29) (2)



TO-92 PACKAGE (CASE 29A) PLASTIC TRANSISTOR WITH SHIELD

MJE340 (SILICON)



CASE 77

NPN silicon power transistor designed for power output stages for television, radio, phonograph and other consumer product applications.

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V_{CEO}	300	Vdc
Emitter-Base Voltage	V_{EB}	3.0	Vdc
Collector Current - Continuous	I_C	500	mAdc
Total Device Dissipation @ T_C = 25°C Derate above 25°C	P_D	20.8 167	Watts mW/°C
Operating and Storage Junction Temperature Range	T_J, T_{stg}	-65 to +150	°C

THERMAL CHARACTERISTICS

Characteristic	Symbol	Value	Unit
Thermal Resistance, Junction to Case	θ_{JC}	6.0	°C/W

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted)

Characteristic	Symbol	Min	Max	Unit
OFF CHARACTERISTICS				
Collector-Emitter Breakdown Voltage (I_C = 1.0 mAdc, I_B = 0)	BV_{CEO}	300	-	Vdc
Collector Cutoff Current (V_{CB} = 300 Vdc, I_E = 0)	I_{CBO}	-	100	μAdc
Emitter Cutoff Current (V_{BE} = 3.0 Vdc, I_C = 0)	I_{EBO}	-	100	μAdc
ON CHARACTERISTICS				
DC Current Gain (I_C = 50 mAdc, V_{CE} = 10 Vdc)	h_{FE}	30	240	-
DYNAMIC CHARACTERISTICS				
Current-Gain–Bandwidth Product (I_C = 100 mAdc, V_{CE} = 10 Vdc, f = 1.0 MHz)	f_T	10	-	MHz

MJE340 (continued)

FIGURE 1 — COLLECTOR CHARACTERISTICS

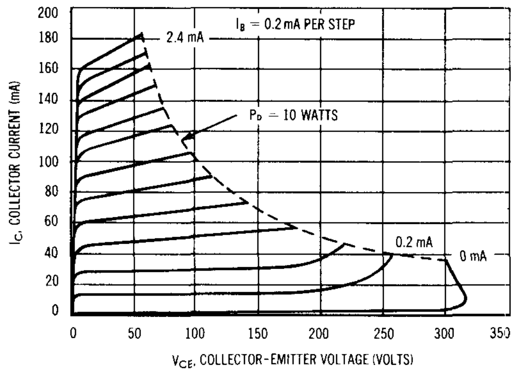


FIGURE 2 — COLLECTOR CURRENT versus BASE-EMITTER VOLTAGE

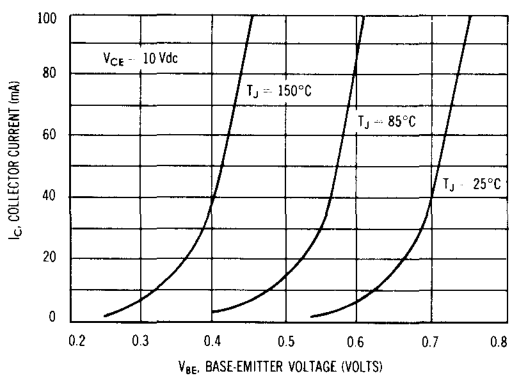


FIGURE 3 — TYPICAL LINE-OPERATED 1.5-WATT AUDIO AMPLIFIER

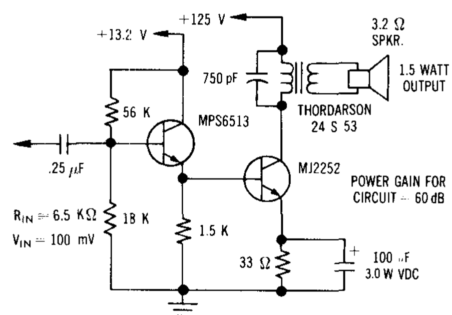


FIGURE 4 — TYPICAL TOTAL HARMONIC DISTORTION versus P_{out}

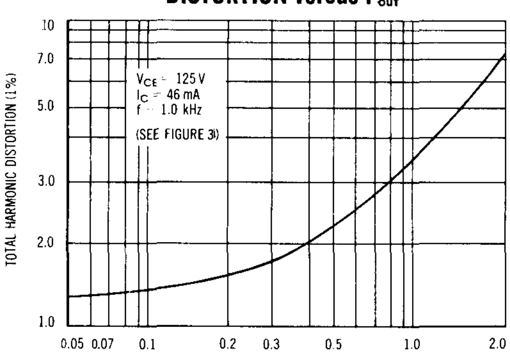
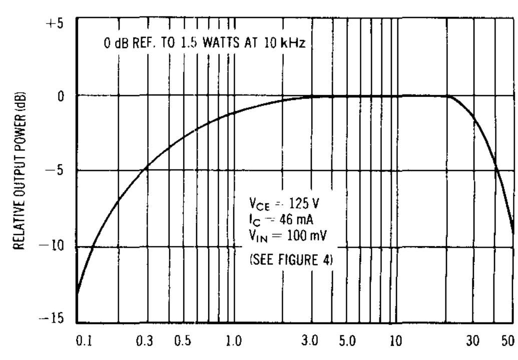
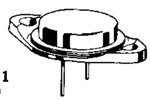


FIGURE 5 — TYPICAL FREQUENCY RESPONSE OF LINE OPERATED AUDIO AMPLIFIER



SILICON POWER TRANSISTOR SELECTOR GUIDE (continued)

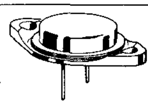
10 AMP ($T_{J(Max)}$ = 200°C)



Case 11 (TO-3)

Ratings	Type NPN / PNP	V_{CEO} Volts (Max)	h_{FE} Min/Max	@ I_C Amp	$V_{CE(sat)}$ Volts (Max)	@ I_C Amp	& I_B Amp
P_D = 117 W, f_T — 1.0 MHz	2N3235	55	20/70	4.0	1.1	4.0	0.4
P_D = 125 W, f_T — 2.5 MHz, †V_{CEX}	MJ413	400†	20/80	0.5	0.8	0.5	0.05
	MJ423	400†	30/90	1.0	0.8	1.0	0.1
	MJ431	400†	15/35	2.5	0.7	2.5	0.5
P_D = 150 W, f_T — 4.0 MHz	2N3713	60	25/90	1.0	1.0	5.0	0.5
	2N3714	80	25/90	1.0	1.0	5.0	0.5
	2N3715	60	50/150	1.0	0.8	5.0	0.5
	2N3716	80	50/150	1.0	0.8	5.0	0.5
	2N3789	60	25/90	1.0	1.0	4.0	0.4
	2N3790	80	25/90	1.0	1.0	4.0	0.4
	2N3791	60	50/150	1.0	1.0	5.0	0.5
	2N3792	80	50/150	1.0	1.0	5.0	0.5
	2N4907	40	20/80	4.0	0.75	4.0	0.4
	2N4908	60	20/80	4.0	0.75	4.0	0.4
	2N4909	80	20/80	4.0	0.75	4.0	0.4

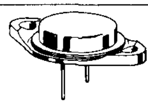
15 AMP ($T_{J(Max)}$ = 200°C)



Case 11 (TO-3)

Ratings	Type	V_{CEO} Volts (Max)	h_{FE} Min/Max	@ I_C Amp	$V_{CE(sat)}$ Volts (Max)	@ I_C Amp	& I_B Amp
P_D = 115 W, f_T — 1.0 MHz	2N3055	60	20/70	4.0	1.1	4.0	0.4

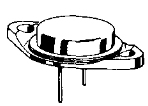
16 AMP ($T_{J(Max)}$ = 200°C)



Case 1 (TO-3)

Ratings	Type	V_{CEO} Volts (Max)	h_{FE} Min/Max	@ I_C Amp	$V_{CE(sat)}$ Volts (Max)	@ I_C Amp	& I_B Amp
P_D = 150 W, f_T — 0.8 MHz	2N3773	140	15/60	8.0	1.4	8.0	0.8

30 AMP ($T_{J(Max)}$ = 200°C)



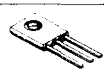
Case 3 (TO-3)

Ratings	Type	V_{CEO} Volts (Max)	h_{FE} Min/Max	@ I_C Amp	$V_{CE(sat)}$ Volts (Max)	@ I_C Amp	& I_B Amp
P_D = 150 W, *f_T — 0.8 MHz, f_T — 2.0 MHz	2N3771*	40	15/60	15	2.0	15	1.5
	2N3772*	60	15/60	10	1.4	10	1.0
	MJ450	40	20/—	10	1.0	10	1.0
P_D = 200 W, f_T — 4.0 MHz	2N4398	40	15/60	15	1.0	15	1.5
	2N4399	60	15/60	15	1.0	15	1.5

PLASTIC See Section 5 for Complete Characteristics

500 mA ($T_{J(Max)}$ = 150°C)

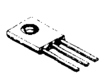
Case 77



Ratings	Type	V_{CEO} Volts (Max)	h_{FE} Min/Max	@ I_C Amp	$V_{CE(sat)}$ Volts (Max)	@ I_C Amp	& I_B Amp
P_D = 20.8 W, f_T — 10 MHz	MJE340	300	30/240	0.05	—	—	—

3.0 AMP ($T_{J(Max)}$ = 150°C)

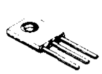
Case 77



Ratings	Type	V_{CEO} Volts (Max)	h_{FE} Min/Max	@ I_C Amp	$V_{CE(sat)}$ Volts (Max)	@ I_C Amp	& I_B Amp
P_D = 30 W, f_T — 3.0 MHz	2N4918	40	20/100	0.5	0.6	1.0	0.1
	2N4919	60	20/100	0.5	0.6	1.0	0.1
	2N4920	80	20/100	0.5	0.6	1.0	0.1
	2N4921	40	20/100	0.5	0.6	1.0	0.1
	2N4922	60	20/100	0.5	0.6	1.0	0.1
	2N4923	80	20/100	0.5	0.6	1.0	0.1

4.0 AMP ($T_{J(Max)}$ = 150°C)

Case 77



Ratings	Type	V_{CEO} Volts (Max)	h_{FE} Min/Max	@ I_C Amp	$V_{CE(sat)}$ Volts (Max)	@ I_C Amp	& I_B Amp
P_D = 40 W, f_T — 4.0 MHz	2N5190	40	25/100	1.5	0.6	1.5	0.15
	2N5191	60	25/100	1.5	0.6	1.5	0.15
	2N5192	80	25/100	1.5	0.6	1.5	0.15
	2N5193	40	25/100	1.5	0.6	1.5	0.15
	2N5194	60	25/100	1.5	0.6	1.5	0.15
	2N5195	80	25/100	1.5	0.6	1.5	0.15