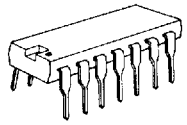
SERIES TPP MEDIUM POWER DARLINGTON ARRAYS

- Sprague Series TPP devices are medium-power Darlington arrays, consisting of 1, 2, 3, or 4 discrete Darlington chips in a single 14-pin DIP package.

These devices provide complements to Series TPQ quad transistor arrays. (See pages 96 through 99).

FOR PACKAGE DIMENSIONS, SEE PAGE 112.

Catalog Number	Polarity	P_D(1) T_A = 25°C (W)	$V_{(BR)}$ CBO Volts	$V_{(BR)}$ CES Volts	$V_{(BR)}$ EBO Volts	I_{CBO} μA Max.	D-C CURRENT GAIN (h_{FE}) Conditions I_C (A)	Conditions V_{CE} Volts	Limits Min.	Limits Max.	$V_{CE(SAT)}$ I_C (A)	$V_{CE(SAT)}$ Max. Volts	Pinning Diagram (Figure)
TPP1000	NPN	2	50	40	12	20	1	5	2000	—	1	1.50	1
TPP2000	NPN	2	50	40	12	20	1	5	2000	—	1	1.50	2
TPP3000	NPN	2	50	40	12	20	1	5	2000	—	1	1.50	3
TPP4000	NPN	2	50	40	12	20	1	5	2000	—	1	1.50	4



PACKAGE A
14 PINS

Notes: 1. Per Package.

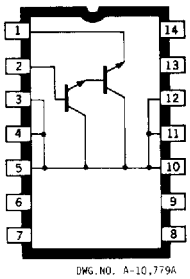


FIGURE 1

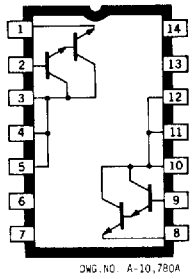


FIGURE 2

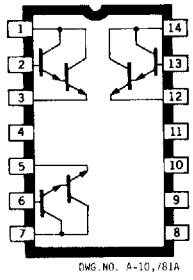


FIGURE 3

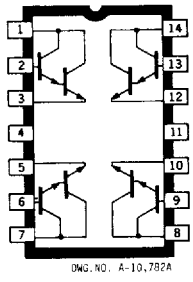


FIGURE 4

SERIES TPQ QUAD TRANSISTOR ARRAYS

- The Sprague Series TPQ quad transistor arrays are general-purpose silicon transistor arrays consisting of four independent transistors. Shown are eight NPN types, five PNP types, and nine NPN/PNP dual complementary pairs.
- All of these devices are furnished in a 14-lead dual in-line plastic A package. The molded package is identical to that used in most consumer integrated circuits and offers superior mechanical protection during insertion into printed wiring boards.

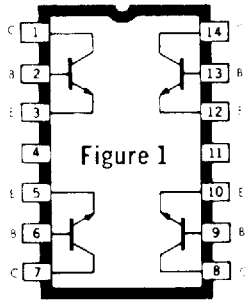
TYPICAL RATINGS (Max.)

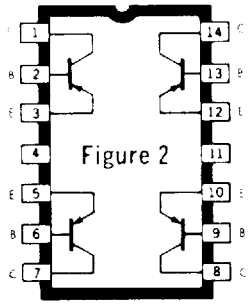
Power Dissipation, P_D
(each transistor) ..... 500 mW
(total package) ..... 2000 mW*

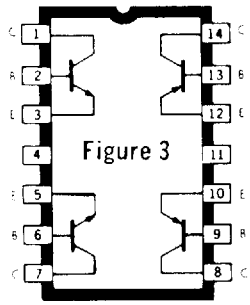
Operating Temperature
Range, T_A ..... −55°C to +150°C

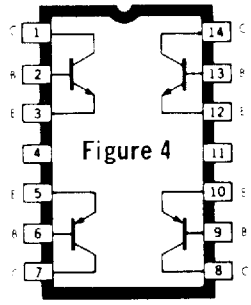
Storage Temperature
Range, T_S ..... −65°C to +150°C

*Derate at the rate of 16.0 mW/°C above T_A = +25°C.









FOR PACKAGE DIMENSIONS, SEE PAGE 112.

Catalog Number	Package Style (Figure)	Polarity	V_{CBO} (V) Min.	V_{CEO} (V) Min.	V_{EBO} (V) Min.	I_{CBO} (nA) Max.	V_{CB} @ (V)	h_{FE} Min.	h_{FE} Max.	I_C @ (mA)	V_{CE} & (V)	$V_{CE(SAT)}$ (V) Max.	$V_{BE(SAT)}$ & (V) Min.	$V_{BE(SAT)}$ & (V) Max.	I_C @ (mA)	C_{ob} (pF) Max.	f_T (MHz) Min.	f_T (MHz) Max.	I_C @ (mA)	t_{off} (ns) Max.	Similar Discrete Device(s)
TPQ2221	1	NPN	60	40	5	50	50	35	—	10	10	0.40	—	1.3		8	200	—	20	—	2N2221
								40	—	150	10	1.60	—	2.6	150						
								20	—	300	10				300						
TPQ2222	1	NPN	60	50	5	50	50	75	—	10	10	0.40	—	1.3		8	200	—	20	—	2N2222
								100	—	150	10	1.60	—	2.6	150						
								30	—	300	10				300						

continued on next page

SERIES TPQ QUAD TRANSISTORS, continued

Catalog Number	Package Style (Figure)	Polarity	V_{CBO} (V) Min.	V_{CEO} (V) Min.	V_{EBO} (V) Min.	I_{CBO} (nA) Max.	@ V_{CB} (V)	h_{FE} Min.	h_{FE} Max.	@ I_C (mA)	& V_{CE} (V)	$V_{CE(SAT)}$ (V) Max.	$V_{CE(SAT)}$ (V) Min.	& $V_{BE(SAT)}$ (V) Max.	@ I_C (mA)	C_{ob} (pF) Max.	f_T (MHz) Min.	f_T (MHz) Max.	@ I_C (mA)	t_{off} (ns) Max.	Similar Discrete Device(s)
TPQ2483	1	NPN	60	40	6	20	45	100	—	0.1	5	0.35	—	0.7[2]	1	6	50	—	0.5	—	2N2483
								150	—	1	5	0.50	—	0.8[2]	10						
								150	—	10	5										
TPQ2484	1	NPN	60	40	6	20	45	200	—	0.1	5	0.35	—	0.7[2]	1	6	50	—	0.5	—	2N2484
								300	—	1	5	0.50	—	0.8[2]	10						
								300	—	10	5										
TPQ2906	2	PNP	−60	−40	−5	−50	−30	35	—	−10	−10	−0.40	—	−1.3	−150	8	200	—	−50	—	2N2906
								40	—	−150	−10	−1.60	—	−2.6	−300						
								30	—	−300	−10										
TPQ2907	2	PNP	−60	−40	−5	−50	−30	75	—	−10	−10	−0.40	—	−1.3	−150	8	200	—	−50	—	2N2907
								100	—	−150	−10	−1.60	—	−2.6	−300						
								50	—	−300	−10										
TPQ2907A	2	PNP	−60	−60	−5	−50	−30	75	—	−10	−10	−0.40	—	−1.3	−150	8	200	—	−50	—	2N2907A
								100	—	−150	−10	−1.60	—	−2.6	−300						
								50	—	−300	−10										
TPQ3724	1	NPN	60[3]	30	5	500	40	35	200	100	1	0.45	0.8	1	500	10	250	—	50	60[4]	2N3724
								25	—	500	2										
TPQ3725	1	NPN	60	40	5	500	40	35	200	100	1	0.45	0.8	1	500	10	250	—	50	60[4]	2N3725
								25	—	500	2										
TPQ3725A	1	NPN	70[3]	50	5	500	40	40	—	100	1	0.45	0.8	1	500	10	200	—	50	60[4]	2N3725A
								30	—	500	2										
TPQ3798	2	PNP	−60	−40	−5	−10	−50	100	—	−0.01	−5	−0.2	—	−0.7	−0.1	4	60	—	−1	—	2N3798
								150	—	−0.10	−5	−0.25	—	−0.8	−1						
								150	—	−0.50	−5										
								125	—	−10	−5										
TPQ3799	2	PNP	−60	−60	−5	−10	−50	225	—	−0.01	−5	−0.20	—	−0.7	−0.1	4	60	—	−1	—	2N3799
								300	—	−0.1	−5	−0.25	—	−0.8	−1						
								300	—	−0.5	−5										
								250	—	−10	−5										
TPQ3904	1	NPN	60	40	6	50	40	30	—	0.1	1	0.20	—	0.85	10	4	250	—	10	—	2N3904
								50	—	1	1										
								75	—	10	1										
TPQ3906	2	PNP	−40	−40	−5	−50	−30	40	—	−0.1	−1	−0.25	—	−0.85	−10	4.5	200	—	−10	—	2N3906
								60	—	−1	−1										
								75	—	−10	−1										
TPQ4258	2	PNP	−12	−12	−4.5	−10	−6.0	30	120	−10	−3	−0.15	−0.8	−0.95	−10	3	700	—	−10	—	2N4258
TPQ4354	2	PNP	−60	−60	−5	−50	−50	25	—	−0.1	−10	−0.15	—	−0.9	−150	30[5]	100	500	−50	—	2N4354
								40	—	−1	−10										
								50	—	−10	−10										
								40	—	−100	−10										
TPQ5400	1	NPN	130	120	5	100[6]	—	30	—	1	5	0.20	—	1	10	6	100	—	10	—	2N5400
								40	180	10	5	0.50	—	1	50						
								40	—	50	5										
TPQ5401	1	NPN	160	150	5	100[7]	—	50	—	1	5	0.20	—	1	10	6	100	—	10	—	2N5401
								60	240	10	5	0.50	—	1	50						
								50	—	50	5										

continued on next page

SERIES TPQ QUAD TRANSISTORS, continued

Catalog Number	Package Style (Figure)	Polarity	V_{CBO} (V) Min.	V_{CEO} (V) Min.	V_{EBO} (V) Min.	I_{CBO} (nA) Max.	@ V_{CB} (V)	h_{FE} Min.	Max.	@ I_C (mA)	& V_{CE} (V)	$V_{CE(SAT)}$ (V) Max.	Min.	& $V_{BE(SAT)}$ (V) Max.	@ I_C (mA)	C_{ob} (pF) Max.	f_T (MHz) Min.	Max.	@ I_C (mA)	t_{off} (ns) Max.	Similar Discrete Device(s)
TPQ5550	2	PNP	−160	−140	−6	−100	−100	60	—	−1	−5	−0.15	—	−1	−10	6	100	—	−10	—	2N5550
								60	250	−10	−5	−0.25	—	−1.2	−50						
								20	—	−50	−5										
TPQ5551	2	PNP	−180	−160	−6	−50	−120	80	—	−1	−5	−0.15	—	−1	−10	6	100	—	−10	—	2N5551
								80	250	−10	−5	−0.25	—	−1.2	−50						
								30	—	−50	−5										
TPQ6001	3	(Note 1)	60	30	5	30	50	25	—	1	10	0.40	—	1.3	150	8	200	—	50	—	2N2221 and 2N2906
								35	—	10	10	1.40	—	−2	300						
								40	—	150	10										
								20	—	300	10										
TPQ6002	3	(Note 1)	60	30	5	30	50	50	—	1	10	0.40	—	1.3	150	8	200	—	50	—	2N2222, and 2N2907
								75	—	10	10	1.40	—	−2	300						
								100	—	150	10										
								30	—	300	10										
TPQ6100	3	(Note 1)	60	40	5	10	50	50	—	0.1	5	0.25	—	0.8	1.0	4	100	—	0.5	—	2N2483 and 2N3798
								75	—	0.5	5										
								75	—	1	5										
								60	—	10	5										
TPQ6100A	3	(Note 1)	60	45	5	10	50	100	—	0.1	5	0.25	—	0.8	1.0	4	100	—	0.5	—	2N2484 and 2N3799
								150	—	0.5	5										
								150	—	1	5										
								60	—	10	5										
TPQ6501	4	(Note 1)	60	30	5	30	50	25	—	1	10	0.40	—	1.3	150	8	200	—	50	—	2N2221 and 2N2906
								35	—	10	10	1.40	—	−2	300						
								40	—	150	10										
								20	—	300	10										
TPQ6502	4	(Note 1)	60	30	5	30	50	50	—	1	10	0.40	—	1.3	150	8	200	—	50	—	2N2222 and 2N2907
								75	—	10	10	1.40	—	−2	300						
								100	—	150	10										
								30	—	300	10										
TPQ6600	4	(Note 1)	60	40	5	10	50	50	—	0.1	5	0.25	—	0.8	1.0	4	100	—	0.5	—	2N2483 and 2N3798
								75	—	0.5	5										
								75	—	1	5										
								60	—	10	5										
TPQ6600A	4	(Note 1)	60	45	5	10	50	100	—	0.1	5	0.25	—	0.8	1.0	4	100	—	0.5	—	2N2484 and 2N3799
								150	—	0.5	5										
								150	—	1	5										
								60	—	10	5										
TPQ6700	4	(Note 1)	40	40	5	50	30	30	—	0.1	1	0.25	—	0.9	10	4.5	200	—	10	—	2N3904 and 2N3906
								50	—	1	1										
								70	—	10	1										
TPQA05	1	NPN	60	60	4	100[8]	—	50	—	10	1	0.25	—	—	100	10	—	—	—	—	MPSA05
								50	—	100	2										
TPQA06	1	NPN	80	80	4	100[9]	—	50	—	10	1	0.25	—	—	100	10	—	—	—	—	MPSA06
								50	—	100	2										

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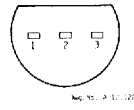
SERIES TPQ QUAD TRANSISTORS, continued

Catalog Number	Package Style (Figure)	Polarity	V_{CBO} (V) Min.	V_{CEO} (V) Min.	V_{EBO} (V) Min.	I_{CBO} (nA) @ Max.	V_{CB} @ (V)	h_{FE} Min.	h_{FE} Max.	I_C @ (mA)	V_{CE} & (V)	$V_{CE(SAT)}$ (V) Max.	$V_{BE(SAT)}$ (V) Min.	$V_{BE(SAT)}$ (V) Max.	I_C @ (mA)	C_{ob} (pF) Max.	f_T (MHz) Min.	f_T (MHz) Max.	I_C @ (mA)	t_{off} (ns) Max.	Similar Discrete Device(s)
TPQA55	2	PNP	60	60	4	100[8]	—	50	—	10	1	0.25	—	—	100	15	—	—	—	—	MPSA55
								50	—	100	2										
TPQA56	2	PNP	80	80	4	100[9]	—	50	—	10	1	0.25	—	—	100	15	—	—	—	—	MPSA56
								50	—	100	2										

Notes: 1. NPN/PNP Complementary pairs. Polarity shown is for NPN devices.
2. $V_{BE(ON)}$ @ I_C as indicated. V_{CE} = 5 V
3. BV_{CES}
4. I_C = ≅ 500 mA, $I_{B1} = I_{B2}$ = ≅ 15 mA
5. C_{cb}
6. I_{ces} @ V_{CE} = 100 V, V_{BE} = 0.
7. I_{ces} @ V_{CE} = 120 V, V_{BE} = 0.
8. I_{ces} @ V_{CE} = 50 V, V_{BE} = 0.
9. I_{ces} @ V_{CE} = 60 V, V_{BE} = 0.

SERIES TZ TRANSISTORS

- Small-signal TO-92 plastic transistors. In-house type numbers designed for amplifier/switching applications.



PINNING

Bottom View

Style	1	2	3
CZ	E	C	B

CZ

FOR PACKAGE DIMENSIONS, SEE PAGE 112.

Catalog Number	Case Style	P_D T_A = 25°C (mW)	Polarity	V_{CBO} (V) Min.	V_{CEO} (V) Min.	V_{EBO} (V) Min.	I_{CBO} (nA) @ Max.	V_{CB} @ (V)	h_{FE} Min.	h_{FE} Max.	I_C @ (mA)	V_{CE} & (V)	$V_{CE(SAT)}$ (V) Max.	$V_{BE(SAT)}$ (V) Min.	$V_{BE(SAT)}$ (V) Max.	I_C @ (mA)	C_{ob} (pF) Max.	f_T (MHz) Min.	f_T (MHz) Max.	I_C @ (mA)	t_{off} (ns) Max.	NF (dB) @ Max.	Test Cond. (note)
TZ81	CZ	360	NPN	60	30	5	10	30	60	—	.001	5	0.2	0.65	0.8	10	8	30	120	0.5	—	2	1
									100	500	.01	5	1.6	—	2.6	500							
									120	—	1	5	0.4	—	1	150							
									165	—	10	5											
TZ82	CZ	360	NPN	60	30	5	10	30	40	500	.010	5	0.2	0.65	0.8	10	8	30	120	0.5	—	3	1
									100	—	1	5	1.6	—	2.6	500							
									120	—	10	5	0.4	—	1	150							
TZ551	CZ	360	PNP	−60	−30	−5	−50	−40	20	—	−1	−10	−0.3	—	−1.3	−150	10[2]	150	—	−20	150[3]	—	—
									30	—	−10	−10											
									40	120	−150	−10											
TZ552	CZ	360	PNP	−60	−30	−5	−50	−40	50	—	−1	−10	−0.3	—	−1.3	−150	10[2]	150	—	−20	150[3]	—	—
									75	—	−10	−10											
									100	300	−150	−10											
TZ553	CZ	360	PNP	−60	−30	−5	−50	−40	100	—	−1	−10	−0.3	—	−1.3	−150	10[2]	150	—	−20	175[3]	—	—
									150	—	−10	−10											
									200	400	−150	−10											
TZ554	CZ	360	PNP	−40	−30	−5	−50	−30	20	—	−1	−10	−0.3	—	−1.3	−150	10[2]	150	—	−20	175[3]	—	—
									30	—	−10	−10											
									40	400	−150	−10											
TZ581	CZ	360	PNP	−40	−30	−5	−10	−30	60	—	−.001	−5	−0.2	−0.65	−0.8	−10	10	20	100	−0.5	—	2	1
									100	500	−.010	−5	−1.6	—	−2.6	−500							
									120	—	−1	−5	−0.4	—	−1	−150							
									150	—	−10	−5											
TZ582	CZ	360	PNP	−40	−30	−5	−10	−30	40	500	−0.01	−5	−0.2	−0.65	−0.8	−10	10	20	100	−0.5	—	3	1
									100	—	−1	−5	−1.6	—	−2.6	−500							
									120	—	−10	−5	−0.4	—	−1	−150							

Notes: 1. WBNF: I_C = −10 µA, V_{CE} = −5 V, R_g = 10 kΩ, Bw = 10 Hz to 15.7 kHz.
2. C_{ob}
3. I_C = 150 mA, $I_{B1} = I_{B2}$ = 15 mA, V_{CC} = 6 V.