

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.

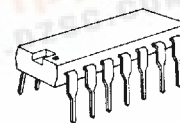
These devices provide complements to Series TPQ quad transistor arrays. (See pages 96 through 99).

FOR PACKAGE DIMENSIONS, SEE PAGE 112.

Catalog Number	Polarity	$P_D(1)$ $T_A = 25^\circ\text{C}$ (W)	$V_{(BR)}$ CBO Volts	$V_{(BR)}$ CES Volts	$V_{(BR)}$ EBO Volts	I_{CBO} μA Max.	D-C CURRENT GAIN (h_{FE})				$V_{CE(SAT)}$ I_C (A) Max. Volts		Pinning Diagram (Figure)
							Conditions		Limits				
							I_C (A)	V_{CE} Volts	Min.	Max.	I_C (A)	Max. Volts	
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



PACKAGE A
14 PINS

Notes: 1. Per Package.

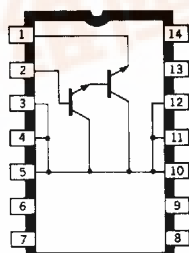


FIGURE 1

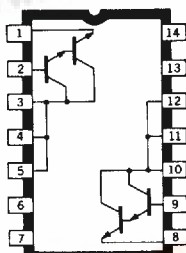


FIGURE 2

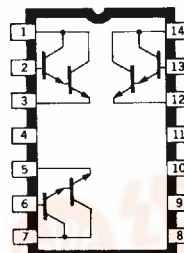


FIGURE 3

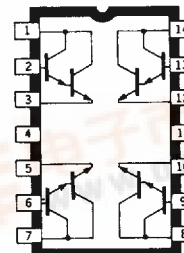


FIGURE 4

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 $+150^\circ\text{C}$

Storage Temperature
 Range, T_S -65°C to $+150^\circ\text{C}$

*Derate at the rate of 16.0 mW/ $^\circ\text{C}$ above $T_A = +25^\circ\text{C}$.

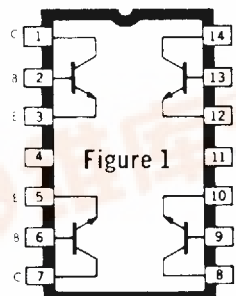


Figure 1

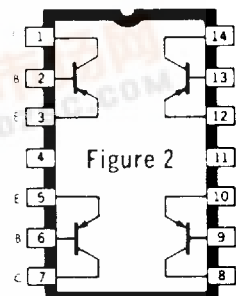


Figure 2

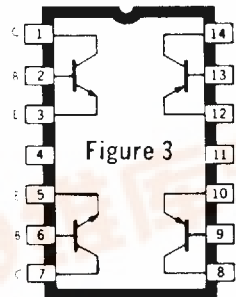


Figure 3

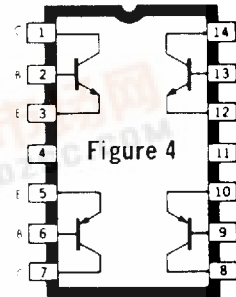


Figure 4

FOR PACKAGE DIMENSIONS, SEE PAGE 112.

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

continued on next page

SERIES TPQ QUAD TRANSISTORS, continued

Catalog Number	Package Style (Figure)	Polarity	V _{CB0} (V) Min.	V _{CE0} (V) Min.	V _{EB0} (V) Min.	I _{CB0} (nA) Max.	V _{CB} (V) @	h _{FE} I _C & V _{CE}				V _{CE(SAT)} (V) & V _{BE(SAT)} (V) @ I _C				C _{ob} (pF) Max.	f _T (MHz) I _C			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											

SERIES TPQ QUAD TRANSISTORS, continued

Catalog Number	Package Style (Figure)	Polarity	V_{CE0} (V)	V_{CE0} (V)	V_{EB0} (V)	I_{C0} (nA)	V_{CB} (V)	h_{FE}	I_C	V_{CE}	$V_{CE(SAT)}$ (V)	$V_{BE(SAT)}$ (V)	I_C	C_{ob} (pF)	f_T (MHz)	I_C	t_{off} (ns)	Similar Discrete Device(s)
			Min.	Min.	Min.	Max.	(V)	Min. Max.	(mA)	(V)	Max. Min.	Max. Min.	(mA)	Max.	Min. Max.	(mA)	Max.	
TPQ5550	2	PNP	-160	-140	-6	-100	-100	60 — 60 20	-1 — -10 — -50	-5 — -5 — -5	-0.15 — -0.25	-1 — -1.2	-10 — -50	6	100	-10	—	2N5550
TPQ5551	2	PNP	-180	-160	-6	-50	-120	80 — 80 30	-1 — -10 — -50	-5 — -5 — -5	-0.15 — -0.25	-1 — -1.2	-10 — -50	6	100	-10	—	2N5551
TPQ6001	3	(Note 1)	60	30	5	30	50	25 — 35 40 20	1 — 10 150 300	10 — 10 — 10 — 10	0.40 — 1.40	1.3 — -2	150 300	8	200	50	—	2N2221 and 2N2906
TPQ6002	3	(Note 1)	60	30	5	30	50	50 — 75 100 30	1 — 10 150 300	10 — 10 — 10 — 10	0.40 — 1.40	1.3 — -2	150 300	8	200	50	—	2N2222 and 2N2907
TPQ6100	3	(Note 1)	60	40	5	10	50	50 — 75 75 60	0.1 — 0.5 1 10	5 — 5 — 5 — 5	0.25 —	0.8	1.0	4	100	0.5	—	2N2483 and 2N3798
TPQ6100A	3	(Note 1)	60	45	5	10	50	100 — 150 150 60	0.1 — 0.5 1 10	5 — 5 — 5 — 5	0.25 —	0.8	1.0	4	100	0.5	—	2N2484 and 2N3799
TPQ6501	4	(Note 1)	60	30	5	30	50	25 — 35 40 20	1 — 10 150 300	10 — 10 — 10 — 10	0.40 — 1.40	1.3 — -2	150 300	8	200	50	—	2N2221 and 2N2906
TPQ6502	4	(Note 1)	60	30	5	30	50	50 — 75 100 30	1 — 10 150 300	10 — 10 — 10 — 10	0.40 — 1.40	1.3 — -2	150 300	8	200	50	—	2N2222 and 2N2907
TPQ6600	4	(Note 1)	60	40	5	10	50	50 — 75 75 60	0.1 — 0.5 1 10	5 — 5 — 5 — 5	0.25 —	0.8	1.0	4	100	0.5	—	2N2483 and 2N3798
TPQ6600A	4	(Note 1)	60	45	5	10	50	100 — 150 150 60	0.1 — 0.5 1 10	5 — 5 — 5 — 5	0.25 —	0.8	1.0	4	100	0.5	—	2N2484 and 2N3799
TPQ6700	4	(Note 1)	40	40	5	50	30	30 — 50 70	0.1 — 1 10	1 — 1 — 1	0.25 —	0.9	10	4.5	200	10	—	2N3904 and 2N3906
TPQA05	1	NPN	60	60	4	100 ⁽⁸⁾	—	50 — 50	10 — 100	1 — 2	0.25 —	—	100	10	—	—	—	MPSA05
TPQA06	1	NPN	80	80	4	100 ⁽⁹⁾	—	50 — 50	10 — 100	1 — 2	0.25 —	—	100	10	—	—	—	MPSA06

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SERIES TPQ QUAD TRANSISTORS, continued

Catalog Number	Package Style (Figure)	Polarity	V _{CE0} (V) Min.	V _{CE0} (V) Min.	V _{EB0} (V) Min.	I _{CB0} (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) & (V) Max. Min.	I _C (mA) @	C _{ob} (pF) Max.	f _T (MHz) Min. Max.	I _C (mA) @	t _{off} (ns) Max.	Similar Discrete Device(s)
TPQA55	2	PNP	60	60	4	100 ⁽⁸⁾	—	50 — 50 —	10 100	1 2	0.25 —	— —	100	15	— —	—	—	MPSA55
TPQA56	2	PNP	80	80	4	100 ⁽⁸⁾	—	50 — 50 —	10 100	1 2	0.25 —	— —	100	15	— —	—	—	MPSA56

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_{CE}

 4. I_C = 500 mA, I_{B1} = I_{B2} = 15 mA

 5. C_{st}

 6. I_{DES} @ V_{CE} = 100 V, V_{BE} = 0.

 7. I_{DES} @ V_{CE} = 120 V, V_{BE} = 0.

 8. I_{DES} @ V_{CE} = 50 V, V_{BE} = 0.

 9. I_{DES} @ 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

FOR PACKAGE DIMENSIONS, SEE PAGE 112.

Catalog Number	Case Style	P _D T _A = 25°C (mW)	Polarity	V _{CE0} (V) Min.	V _{CE0} (V) Min.	V _{EB0} (V) Min.	I _{CB0} (nA) Max.	V _{CB} (V) @	h _{FE} Min.	I _C (mA) @	V _{CE} (V) &	V _{CE(SAT)} (V) Max.	V _{BE(SAT)} (V) Max.	I _C (mA) @	C _{ob} (pF) Max.	f _T (MHz) Min.	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_{CE} = 6 V.