

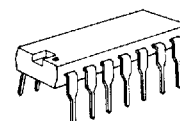
SERIES TPP MEDIUM POWER DARLINGTON ARRAYS

- 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	PACKAGE A 14 PINS
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.

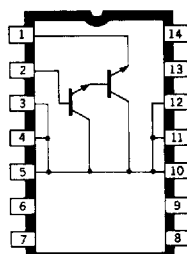


FIGURE 1

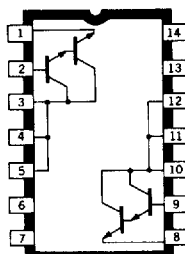


FIGURE 2

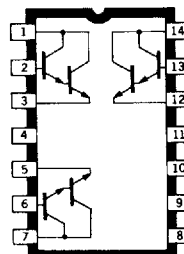


FIGURE 3

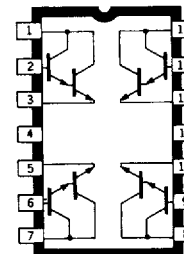


FIGURE 4

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

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

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

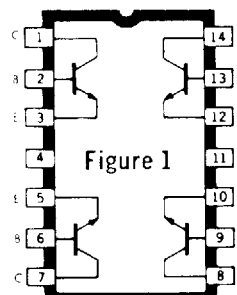


Figure 1

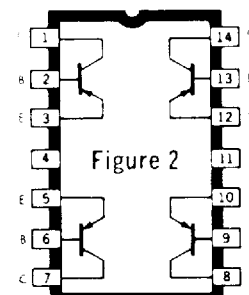


Figure 2

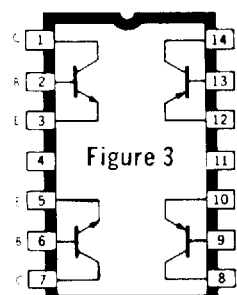


Figure 3

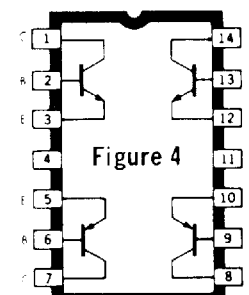


Figure 4

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)		I_C (mA)	t_{off} (ns)	Similar Discrete Device(s)
			Min.	Min.	Min.	Max.	@	Min.	Max.	@	&	Max.	Min.	Max.	Max.	Min.	Max.	@	Max.		
							(V)			(mA)	(V)				(mA)			(mA)			
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							

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SERIES TPQ QUAD TRANSISTORS, continued

Catalog Number	Package Style (Figure)	Polarity	V_{CBO} (V)	V_{CEO} (V)	V_{EBO} (V)	I_{CBO} (nA)	V_{CE} (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)		I_C (mA)	t_{off} (ns)	Similar Discrete Device(s)
			Min.	Min.	Min.	Max.	Max.	Min.	Max.	Max.	Min.	Max.	Max.	Min.	Max.	Min.	Max.	Max.			
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										

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SERIES TPQ QUAD TRANSISTORS, continued

Catalog Number	Package Style (Figure)	Polarity	V_{CB0}	V_{CE0}	V_{EB0}	I_{CB0}	V_{CB}	h_{FE}				$V_{CE(SAT)}$				C_{ob}	f_T			t_{off}	Similar Discrete Device(s)
			(V) Min.	(V) Min.	(V) Min.	(nA) Max.	(V) Max.	Min.	Max.	(mA) Max.	(V) Max.	(V) Max.	(V) Max.	(mA) Max.	(pF) Max.	(MHz) Min.	(MHz) Max.	(ns) Max.			
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 _{CE0} (V) Min.	V _{CE0} (V) Min.	V _{EB0} (V) Min.	I _{CB0} (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
TPQA56	2	PNP	80	80	4	100 ⁽⁹⁾	—	50	—	10	1	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_{CE0}

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

 5. C_{ob}

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

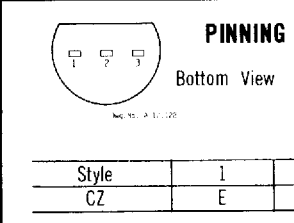
 7. I_{ces} @ V_{CE} = 120 V, V_{BE} = 0.

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

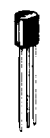
 9. I_{ces} @ V_{CE} = 60 V, V_{BE} = 0.

SERIES TZ TRANSISTORS

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



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 _{CE0} (V) Min.	V _{CE0} (V) Min.	V _{EB0} (V) Min.	I _{CB0} (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) @	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.