

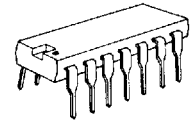
SERIES TPP MEDIUM POWER DARLINGTON ARRAYS

- 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})				$V_{CE(SAT)}$		Pinning Diagram (Figure)		
							Conditions		Limits		I_C (A)	Max. Volts		I_C (A)	Max. Volts
							I_C (A)	V_{CE} Volts	Min.	Max.					
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.

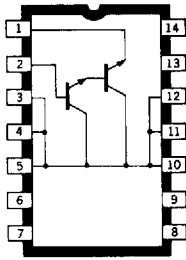


FIGURE 1

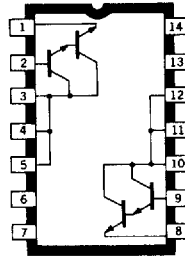


FIGURE 2

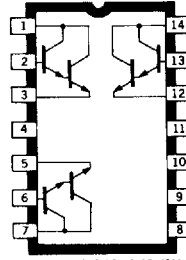


FIGURE 3

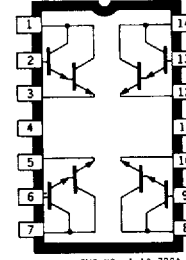


FIGURE 4

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

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

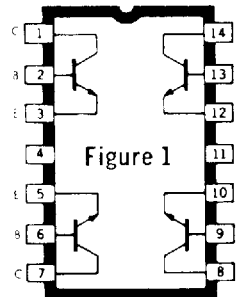


Figure 1

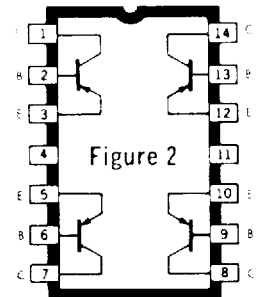


Figure 2

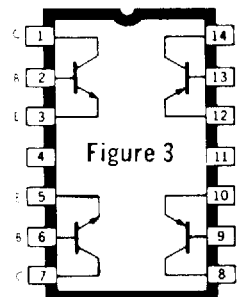


Figure 3

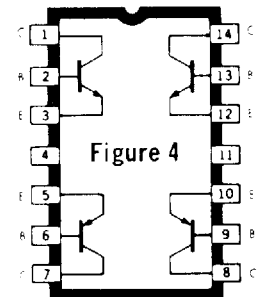


Figure 4

FOR PACKAGE DIMENSIONS, SEE PAGE 112.

Catalog Number	Package Style (Figure)	Polarity	V_{CBO} (V) Min.	V_{CEO} (V) Min.	V_{EBO} (V) Min.	I_{CBO} (nA) Max.	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) Max.	f_T (MHz)		I_C (mA) @	t_{ST} (ns) Max.	Similar Discrete Device(s)
								Min.	Max.			Max.	Min.			Max.				
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						
								20	—	300	10									
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						
								30	—	300	10									

continued on next page

SERIES TPQ QUAD TRANSISTORS, continued

Catalog Number	Package Style (Figure)	Polarity	V_{CB0} (V)	V_{CE0} (V)	V_{EB0} (V)	I_{CB0} (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.	@	Min.	Max.	@	Max.	Min.	Max.	@	Max.	Min.	Max.	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 ⁽³⁾	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}		I_C	V_{CE}	$V_{CE(SAT)}$		$V_{BE(SAT)}$	I_C	C_{ob}	f_T		I_C	t_{off}	Similar Discrete Device(s)
			(V) Min.	(V) Min.	(V) Min.	(nA) Max.	(V)	Min.	Max.	(mA) @	(V)	Max.	Min.	Max.	(mA) @	(pF) Max.	Min.	Max.	(mA) @	(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
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_{CEO}	V_{EBO}	I_{CBO}	V_{CB}	h_{FE}		I_C	V_{CE}	$V_{CE(SAT)}$		$V_{BE(SAT)}$	I_C	C_{ob}	f_T		I_C	t_{off}	Similar Discrete Device(s)
			(V) Min.	(V) Min.	(V) Min.	(nA) Max.	(V)	Min.	Max.			(mA)	(V)				Max.	Min.			
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

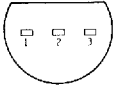
Notes: 1. NPN/PNP Complementary pairs. Polarity shown is for NPN devices.
 2. $V_{BE(ON)}$ @ I_C as indicated. $V_{CE} = 5$ V
 3. BV_{CES}
 4. $I_C = \approx 500$ mA, $I_{B1} = I_{B2} = \approx 15$ mA

5. C_{ce}
 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



CZ

Style	1	2	3
CZ	E	C	B

FOR PACKAGE DIMENSIONS, SEE PAGE 112.

Catalog Number	Case Style	P_D $T_A = 25^\circ\text{C}$ (mW)	Polarity	V_{CBO}	V_{CEO}	V_{EBO}	I_{CBO}	V_{CB}	h_{FE}		I_C	V_{CE}	$V_{CE(SAT)}$		$V_{BE(SAT)}$	I_C	C_{ob}	f_T		I_C	t_{off}	NF	Test
				(V) Min.	(V) Min.	(V) Min.	(nA) Max.	(V)	Min.	Max.			(mA)	(V)				Max.	Min.				
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: $I_C = -10$ μ A, $V_{CE} = -5$ V, $R_g = 10$ k Ω , 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.