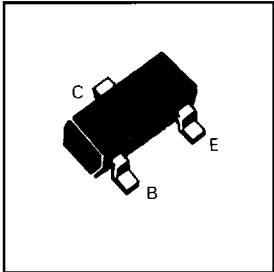


SOT23 NPN SILICON PLANAR SMALL SIGNAL TRANSISTORS

BCW60

PARTMARKING DETAILS:-

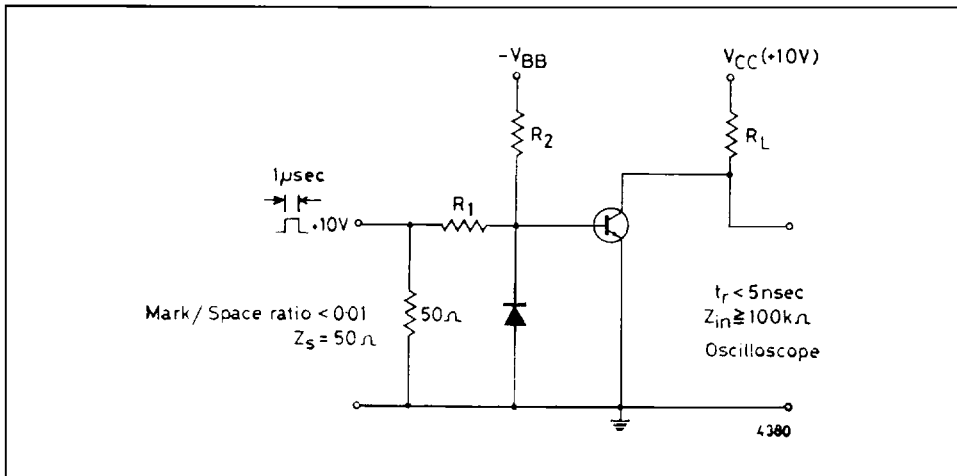
BCW60A - AA	BCW60AR - CR
BCW60B - AB	BCW60BR - DR
BCW60C - AC	BCW60CR - AR
BCW60D - AD	BCW60DR - BR



ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	VALUE	UNIT
Collector-Base Voltage	V_{CBO}	32	V
Collector-Emitter Voltage	V_{CEO}	32	V
Emitter-Base Voltage	V_{EBO}	5	V
Continuous Collector Current	I_C	200	mA
Base Current	I_B	50	mA
Power Dissipation at $T_{amb} = 25^\circ\text{C}$	P_{TOT}	330	mW
Operating and Storage Temperature Range	tj:tstg	- 55 to + 150	$^\circ\text{C}$

SWITCHING CIRCUIT



BCW60

ELECTRICAL CHARACTERISTICS (at $T_{amb} = 25^{\circ}\text{C}$ unless otherwise stated)

PARAMETER		SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Collector-Emitter Breakdown Voltage		$V_{(BR)CEO}$	32			V	$I_{CEO} = 2\text{mA}$
Emitter-Base Breakdown Voltage		$V_{(BR)EBO}$	5			V	$I_{EBO} = 1\mu\text{A}$
Collector-Emitter Cut-Off Current		I_{CES}			20 20	nA μA	$V_{CES} = 32\text{V}$ $V_{CES} = 32\text{V}, T_{amb} = 150^{\circ}\text{C}$
Emitter-Base Cut-Off Current		I_{EBO}			20	nA	$V_{EBO} = 4\text{V}$
Collector-Emitter Saturation Voltage		$V_{CE(SAT)}$		0.12 0.20	0.35 0.55	V V	$I_C = 10\text{mA}, I_B = 0.25\text{mA}$ $I_C = 50\text{mA}, I_B = 1.25\text{mA}$
Base-Emitter Saturation Voltage		$V_{BE(SAT)}$	0.60 0.70	0.70 0.83	0.85 1.05	V V	$I_C = 10\text{mA}, I_B = 0.25\text{mA}$ $I_C = 50\text{mA}, I_B = 1.25\text{mA}$
Base-Emitter Voltage		V_{BE}	0.55	0.52 0.65 0.78	0.75	V V V	$I_C = 10\mu\text{A}, V_{CE} = 5\text{V}$ $I_C = 2\text{mA}, V_{CE} = 5\text{V}$ $I_C = 50\text{mA}, V_{CE} = 1\text{V}$
Static Forward current transfer ratio	BCW60A	h_{FE}	120 50	78 170	220		$I_C = 10\mu\text{A}, V_{CE} = 5\text{V}$ $I_C = 2\text{mA}, V_{CE} = 5\text{V}$ $I_C = 50\text{mA}, V_{CE} = 1\text{V}$
	BCW60B	h_{FE}	20 180 70	145 250	310		$I_C = 10\mu\text{A}, V_{CE} = 5\text{V}$ $I_C = 2\text{mA}, V_{CE} = 5\text{V}$ $I_C = 50\text{mA}, V_{CE} = 1\text{V}$
	BCW60C	h_{FE}	40 250 90	220 350	460		$I_C = 10\mu\text{A}, V_{CE} = 5\text{V}$ $I_C = 2\text{mA}, V_{CE} = 5\text{V}$ $I_C = 50\text{mA}, V_{CE} = 1\text{V}$
	BCW60D	h_{FE}	100 380 100	300 500	630		$I_C = 10\mu\text{A}, V_{CE} = 5\text{V}$ $I_C = 2\text{mA}, V_{CE} = 5\text{V}$ $I_C = 50\text{mA}, V_{CE} = 1\text{V}$
Transition Frequency		f_T	125	250		MHz	$I_C = 10\text{mA}, V_{CE} = 5\text{V}$ $f = 100\text{MHz}$
Collector-Base Capacitance		C_{cbo}			4.5	pF	$V_{CBO} = 10\text{V}, f = 1\text{MHz}$
Emitter-Base Capacitance		C_{ebo}		8		pF	$V_{EBO} = 0.5\text{V}, f = 1\text{MHz}$
Noise Figure		N		2	6	dB	$I_C = 0.2\text{mA}, V_{CE} = 5\text{V}$ $R_G = 2\text{k}\Omega, f = 1\text{kHz}$ $\Delta f = 200\text{Hz}$
Switching times:							
Delay Time		t_d		35		ns	$I_C : I_{B1} : I_{B2} = 10 : 1 : 1\text{mA}$ $R_1 = 5\text{k}\Omega, R_2 = 5\text{k}\Omega$ $V_{BB} = 3.6\text{V}, R_L = 990\Omega$
Rise Time		t_r		50		ns	
Turn-On Time		t_{on}		85	150	ns	
Storage Time		t_s		400		ns	
Fall Time		t_f		80		ns	
Turn-Off Time		t_{off}		480	800	ns	

FOUR TERMINAL NETWORK DATA ($I_C = 2\text{mA}, V_{CE} = 5\text{V}, f = 1\text{kHz}$)

	h_{FE} Group A			h_{FE} Group B			h_{FE} Group C			h_{FE} Group D			
	Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.	
h_{11e}	1.6	2.7	4.5	2.5	3.6	6.0	3.2	4.5	8.5	4.5	7.5	12	K
h_{12e}		1.5			2			2			3		10^{-4}
h_{21e}		200			260			330			520		
h_{22e}		18	30		24	50		30	60		50	100	μs