

MP6901

HIGH POWER SWITCHING APPLICATIONS

HAMMER DRIVE, PULSE MOTOR DRIVE AND INDUCTIVE LOAD SWITCHING

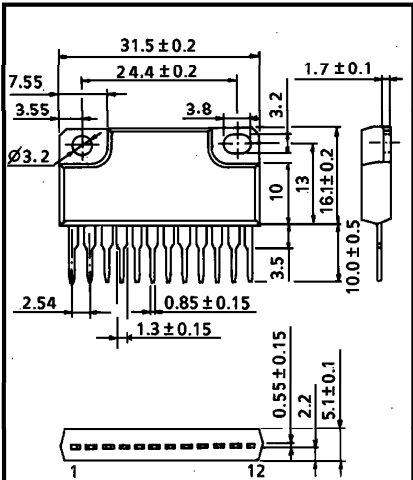
- Package with Heat Sink Isolated to Lead (SIP 12 Pin)
- High Collector Power Dissipation (6 Devices Operation)
: $P_T = 5W$ ($T_a = 25^{\circ}C$)
- High Collector Current : $I_C (DC) = \pm 4 A$ (Max.)
- High DC Current Gain : $h_{FE} = 2000$ (Min.)
($V_{CE} = \pm 2 V$, $I_C = \pm 1 A$)

MAXIMUM RATINGS ($T_a = 25^{\circ}C$)

CHARACTERISTIC		SYMBOL	RATING		UNIT
			NPN	PNP	
Collector-Base Voltage		V _{CBO}	100	−100	V
Collector-Emitter Voltage		V _{CEO}	80	−80	V
Emitter-Base Voltage		V _{EBO}	5	−5	V
Collector Current		I _C	4	−4	A
		I _{CP}	6	−6	
Continuous Base Current		I _B	0.4	−0.4	A
Collector Power Dissipation (1 Device Operation)		P _C	3.0		W
Collector Power Dissipation (6 Devices Operation)	T _a = 25°C	P _T	5.0		W
	T _c = 25°C		25		
Isolation Voltage		V _{Isol}	1000		V
Junction Temperature		T _j	150		°C
Storage Temperature Range		T _{stg}	−55 ~ 150		°C

INDUSTRIAL APPLICATIONS

Unit in mm



1, 11, 12 EMITTER
2, 4, 5, 7, 8, 10 BASE
3, 6, 9 COLLECTOR

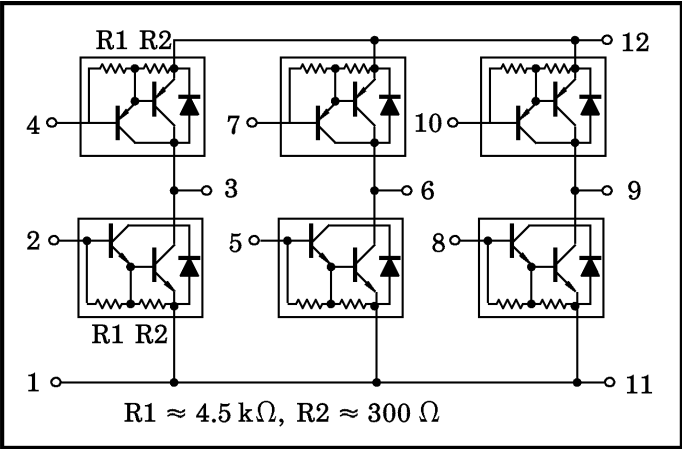
JEDEC	—
EIAJ	—
TOSHIBA	2-32B1D

Weight : 6.0 g

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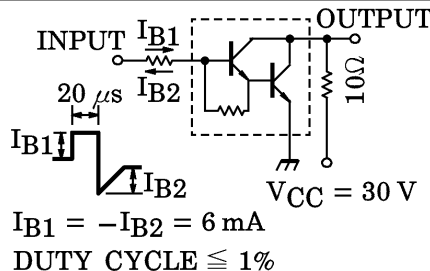
ARRAY CONFIGURATION



THERMAL CHARACTERISTICS

CHARACTERISTIC	SYMBOL	MAX.	UNIT
Thermal Resistance of Junction to Ambient (6 Devices Operation, $T_a = 25^{\circ}\text{C}$)	$\Sigma R_{th(j-a)}$	25	$^{\circ}\text{C} / \text{W}$
Thermal Resistance of Junction to Case (6 Devices Operation, $T_c = 25^{\circ}\text{C}$)	$\Sigma R_{th(j-c)}$	5.0	$^{\circ}\text{C} / \text{W}$
Maximum Lead Temperature for Soldering Purposes (3.2 mm from Case for 10 s)	T_L	260	$^{\circ}\text{C}$

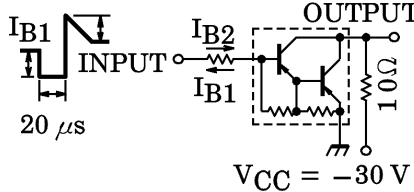
ELECTRICAL CHARACTERISTICS ($T_a = 25^\circ\text{C}$) (NPN TRANSISTOR)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Collector Cut-off Current		I_{CBO}	$V_{CB} = 100\text{ V}, I_E = 0$	—	—	20	μA
Collector Cut-off Current		I_{CEO}	$V_{CE} = 80\text{ V}, I_B = 0$	—	—	20	μA
Emitter Cut-off Current		I_{EBO}	$V_{EB} = 5\text{ V}, I_C = 0$	0.5	—	2.5	mA
Collector-Base Breakdown Voltage		$V_{(BR) CBO}$	$I_C = 1\text{ mA}, I_E = 0$	100	—	—	V
Collector-Emitter Breakdown Voltage		$V_{(BR) CEO}$	$I_C = 10\text{ mA}, I_B = 0$	80	—	—	V
DC Current Gain		$h_{FE} (1)$	$V_{CE} = 2\text{ V}, I_C = 1\text{ A}$	2000	—	—	
		$h_{FE} (2)$	$V_{CE} = 2\text{ V}, I_C = 3\text{ A}$	1000	—	—	
Saturation Voltage	Collector-Emitter	$V_{CE} (\text{sat})$	$I_C = 3\text{ mA}, I_B = 6\text{ mA}$	—	—	1.5	V
	Base-Emitter	$V_{BE} (\text{sat})$	$I_C = 3\text{ mA}, I_B = 6\text{ mA}$	—	—	2.0	
Transition Frequency		f_T	$V_{CE} = 2\text{ V}, I_C = 0.5\text{ A}$	—	60	—	MHz
Collector Output Capacitance		C_{ob}	$V_{CB} = 10\text{ V}, I_E = 0, f = 1\text{ MHz}$	—	35	—	pF
Switching Time	Turn-on Time	t_{on}	 <p> $I_{B1} = -I_{B2} = 6\text{ mA}$ DUTY CYCLE $\leq 1\%$ </p>	—	0.2	—	μs
	Storage Time	t_{stg}		—	1.5	—	
	Fall Time	t_f		—	0.6	—	

EMITTER-COLLECTOR DIODE RATINGS AND CHARACTERISTICS ($T_a = 25^\circ\text{C}$)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Forward Current	I_{FM}	—	—	—	4	A
Surge Current	I_{FSM}	$t = 1\text{ s}, 1\text{ shot}$	—	—	6	A
Forward Voltage	V_F	$I_F = 1\text{ A}, I_B = 0$	—	—	2.0	V
Reverse Recovery Time	t_{rr}	$I_F = 4\text{ A}, V_{BE} = -3\text{ V},$	—	1.0	—	μs
Reverse Recovery Charge	Q_{rr}	$dI_F / dt = -50\text{ A} / \mu\text{s}$	—	8	—	μC

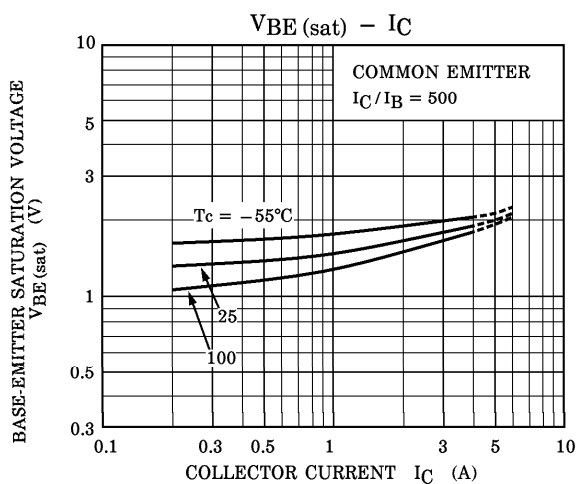
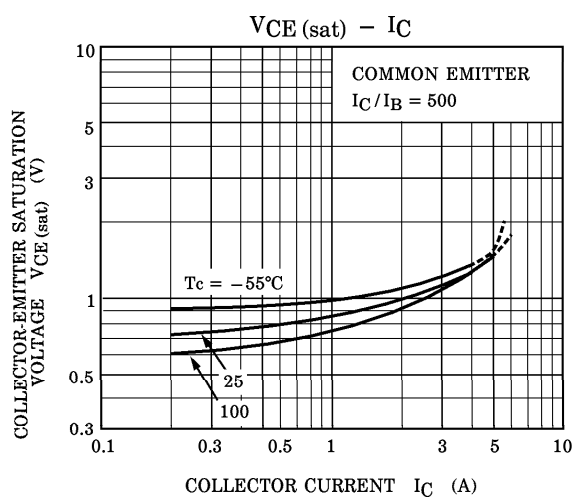
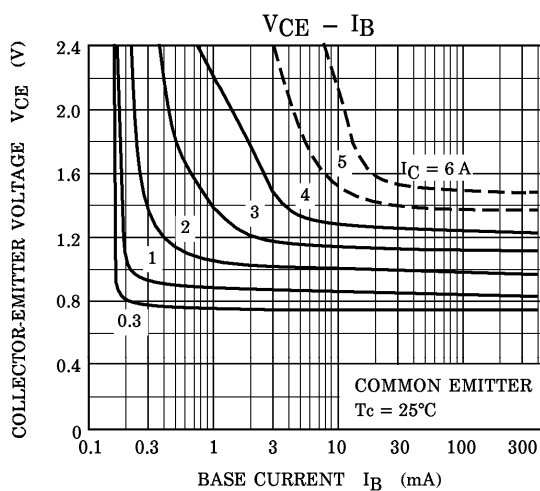
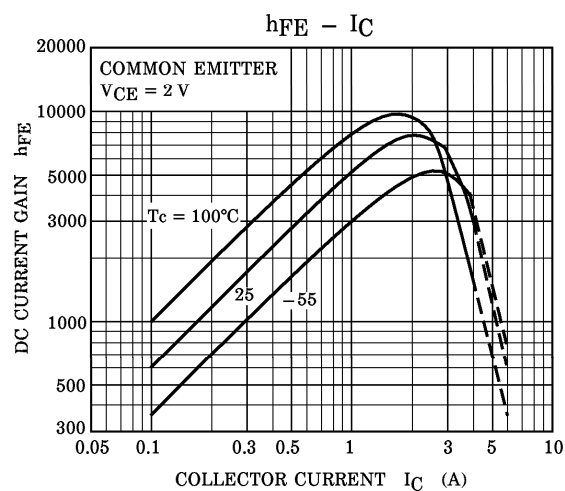
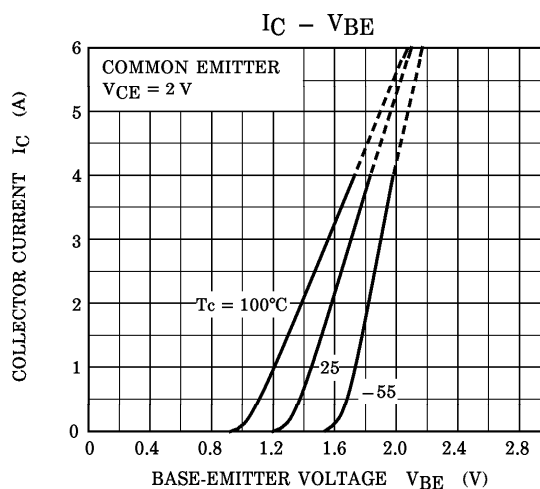
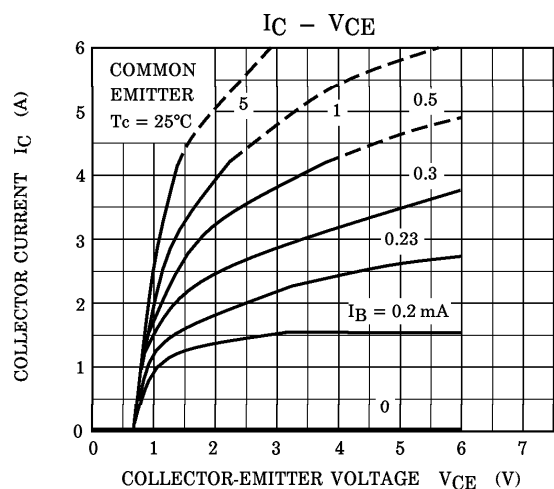
ELECTRICAL CHARACTERISTICS ($T_a = 25^\circ\text{C}$) (PNP TRANSISTOR)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Collector Cut-off Current		I_{CBO}	$V_{CB} = -100\text{ V}, I_E = 0$	—	—	-20	μA
Collector Cut-off Current		I_{CEO}	$V_{CE} = -80\text{ V}, I_B = 0$	—	—	-20	μA
Emitter Cut-off Current		I_{EBO}	$V_{EB} = -5\text{ V}, I_C = 0$	-0.5	—	-2.5	mA
Collector-Base Breakdown Voltage		$V_{(BR)CBO}$	$I_C = -1\text{ mA}, I_E = 0$	-100	—	—	V
Collector-Emitter Breakdown Voltage		$V_{(BR)CEO}$	$I_C = -10\text{ mA}, I_B = 0$	-80	—	—	V
DC Current Gain		$h_{FE}(1)$	$V_{CE} = -2\text{ V}, I_C = -1\text{ A}$	2000	—	—	
		$h_{FE}(2)$	$V_{CE} = -2\text{ V}, I_C = -3\text{ A}$	1000	—	—	
Saturation Voltage	Collector-Emitter	$V_{CE(sat)}$	$I_C = -3\text{ A}, I_B = -6\text{ mA}$	—	—	-1.5	V
	Base-Emitter	$V_{BE(sat)}$	$I_C = -3\text{ A}, I_B = -6\text{ mA}$	—	—	-2.0	
Transition Frequency		f_T	$V_{CE} = -2\text{ V}, I_C = -0.5\text{ A}$	—	40	—	MHz
Collector Output Capacitance		C_{ob}	$V_{CB} = -10\text{ V}, I_E = 0,$ $f = 1\text{ MHz}$	—	60	—	pF
Switching Time	Turn-on Time	t_{on}	 <p>$V_{CC} = -30\text{ V}$ DUTY CYCLE $\leq 1\%$</p>	—	0.15	—	μs
	Storage Time	t_{stg}		—	0.80	—	
	Fall Time	t_f		—	0.40	—	

EMITTER-COLLECTOR DIODE RATINGS AND CHARACTERISTICS ($T_a = 25^\circ\text{C}$)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Forward Current	I_{FM}	—	—	—	4	A
Surge Current	I_{FSM}	$t = 1\text{ s}, 1\text{ shot}$	—	—	6	A
Forward Voltage	V_F	$I_F = 1\text{ A}, I_B = 0$	—	—	2.0	V
Reverse Recovery Time	t_{rr}	$I_F = 4\text{ A}, V_{BE} = 3\text{ V},$	—	1.0	—	μs
Reverse Recovery Charge	Q_{rr}	$dI_F/dt = -50\text{ A}/\mu\text{s}$	—	8	—	μC

(NPN TRANSISTOR)



(PNP TRANSISTOR)

