

2SC3852/3852A

Application : Driver for Solenoid and Motor, Series Regulator and General Purpose

(Ta=25°C)

Symbol	Conditions		Ratings		Unit
			2SC3852	2SC3852A	
ICBO			10max		μA
		V _{CB} =	80	100	V
IEBO	V _{EB} =6V		100max		μA
V(BR)CEO	I _C =25mA		60min	80min	V
h _{FE}	V _{CE} =4V, I _C =0.5A		500min		
V _{CE(sat)}	I _C =2A, I _B =50mA		0.5max		V
f _T	V _{CE} =12V, I _E =-0.2A		15typ		MHz
C _{OB}	V _{CB} =10V, f=1MHz		50typ		pF

V _{CC} (V)	R _L (Ω)	I _C (A)	V _{BB1} (V)	V _{BB2} (V)	I _{B1} (mA)	I _{B2} (mA)	t _{on} (μs)	t _{stg} (μs)	t _f (μs)
20	20	1.0	10	-5	15	-30	0.8typ	3.0typ	1.2typ

Weight : Approx 2.0g

a. Part No.

b. Lot No.

The graph plots Collector Current I_C (A) on the y-axis (0 to 3) against Collector-Emitter Voltage V_{CE} (V) on the x-axis (0 to 6). Multiple curves are shown for different base currents I_B : 12 mA, 8 mA, 5 mA, 3 mA, 2 mA, 1 mA, and 0.5 mA. The curves show that I_C increases with V_{CE} and is approximately equal to I_B for $V_{CE} > 1$ V.

The graph plots the Collector-Emitter Saturation Voltage $V_{CE(sat)}$ in Volts (V) on the y-axis against the Base Current I_B in Amperes (A) on the x-axis. The y-axis is logarithmic, ranging from 0.1 to 1.0 V. The x-axis is also logarithmic, ranging from 0.001 to 1.0 A. Three curves are shown for different collector currents I_C : 1A, 2A, and 3A. The curves show that $V_{CE(sat)}$ decreases as I_B increases and as I_C decreases.

Base Current I_B (A)	$V_{CE(sat)}$ (V) for $I_C = 1A$	$V_{CE(sat)}$ (V) for $I_C = 2A$	$V_{CE(sat)}$ (V) for $I_C = 3A$
0.002	0.8	-	-
0.005	0.4	0.8	-
0.01	0.3	0.6	0.9
0.05	0.2	0.4	0.7
0.1	0.18	0.35	0.6
0.5	0.15	0.3	0.5
1.0	0.14	0.28	0.45

The graph shows the relationship between Collector Current I_C (A) and Base-Emitter Voltage V_{BE} (V) for a BJT at $V_{CE}=4V$. The curves are plotted for three different temperatures: 125°C, 25°C, and -30°C. The curves show that I_C increases exponentially with V_{BE} , and the curves shift to the left as temperature decreases.

V_{BE} (V)	I_C (A) at 125°C	I_C (A) at 25°C	I_C (A) at -30°C
0.5	0.0	0.0	0.0
0.6	0.5	0.0	0.0
0.7	1.5	0.2	0.0
0.8	3.0	1.0	0.1
0.9	-	2.0	0.5
1.0	-	4.0	1.0

Graph of DC Current Gain h_{FE} vs Collector Current I_C (A) for 2N3866 at $V_{CE}=4V$. The graph shows three curves: Typ (typical), and two solid lines representing the range. The y-axis is logarithmic from 100 to 2000. The x-axis is logarithmic from 0.01 to 3 A. The typical curve peaks at $h_{FE} \approx 1000$ for $I_C \approx 0.1$ A.

Graph of DC Current Gain h_{FE} vs Collector Current I_C (A) for 2N3866 at $V_{CE}=4V$. The graph shows three curves for temperatures 125°C, 25°C, and -30°C. The y-axis is logarithmic from 100 to 2000. The x-axis is logarithmic from 0.01 to 3 A. The 125°C curve peaks at ~1200, 25°C at ~800, and -30°C at ~500.

The graph shows the transient thermal resistance θ_{JA} in $^{\circ}\text{C}/\text{W}$ as a function of time t in milliseconds (ms) for a 2N3055 transistor. The y-axis is logarithmic, ranging from 0.5 to 5. The x-axis is also logarithmic, ranging from 1 to 1000 ms. The curve starts at approximately 0.7 $^{\circ}\text{C}/\text{W}$ at 1 ms and increases to about 4.5 $^{\circ}\text{C}/\text{W}$ at 1000 ms. Operating conditions are specified as $V_{CB}=10\text{V}$ and $I_E=-2\text{A}$.

Time t (ms)	Transient Thermal Resistance θ_{JA} ($^{\circ}\text{C}/\text{W}$)
1	0.7
10	1.5
100	2.5
1000	4.5

Graph of Cut-off Frequency f_T (MHz) vs. Emitter Current I_E (A) for the 2N4350 JFET. The graph shows two curves: a solid line for typical performance and a dashed line for minimum performance. The typical curve peaks at approximately 20 MHz at $I_E = -0.1$ A, while the minimum curve peaks at approximately 16 MHz at $I_E = -0.1$ A. The graph is for $V_{GS} = 0V$ and $V_{DS} = 12V$.

The graph shows the relationship between Collector Current I_c (A) and Collector-Emitter Voltage V_{CE} (V) for the 2N3858 JFET. The curves are plotted on a log-log scale. The DC curve shows a maximum I_c of approximately 3.5 A at $V_{CE} = 10$ V. The 100ms, 10ms, and 1ms curves show increasing I_c for a given V_{CE} as the pulse width decreases, indicating thermal effects. A note indicates 'Without Heatsink Natural Cooling'.

V_{CE} (V)	DC I_c (A)	100ms I_c (A)	10ms I_c (A)	1ms I_c (A)
10	3.5	3.5	3.5	3.5
20	2.5	2.5	2.5	2.5
30	1.5	1.5	1.5	1.5
40	0.8	1.2	2.0	3.0
50	0.4	0.8	1.5	2.5
60	0.2	0.4	0.8	1.5

The graph illustrates the relationship between Maximum Power Dissipation (P_c) and Ambient Temperature (T_a) for a MOSFET. The y-axis represents P_c in Watts (W), ranging from 0 to 30. The x-axis represents T_a in degrees Celsius ($^{\circ}\text{C}$), ranging from 0 to 150. Two curves are shown: one for a device without a heatsink and one for a device with an infinite heatsink. Both curves show a constant power dissipation up to 25°C, after which the power dissipation decreases linearly to zero at 150°C.

Ambient Temperature T_a ($^{\circ}\text{C}$)	Maximum Power Dissipation P_c (W) Without Heatsink	Maximum Power Dissipation P_c (W) With Infinite heatsink
0	2.5	25
25	2.5	25
50	2.0	20
75	1.5	15
100	1.0	10
125	0.5	5
150	0	0