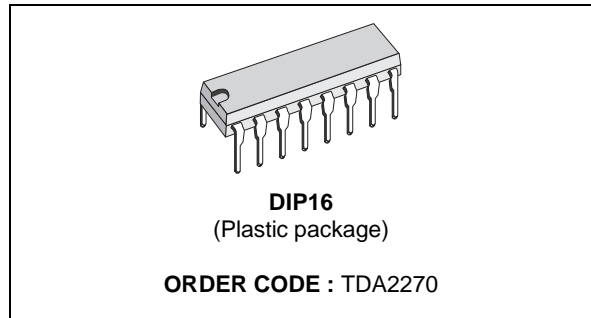


TV VERTICAL DEFLECTION OUTPUT CIRCUIT

- DRIVES VERTICAL DEFLECTION WINDINGS DIRECTLY
- HIGH EFFICIENCY
- INTERNAL FLYBACK GENERATOR
- THERMAL PROTECTION
- ON-CHIP VOLTAGE REFERENCE
- HIGH OUTPUT CURRENT (2.2 A peak)
- 16-LEAD POWERDIP PLASTIC PACKAGE

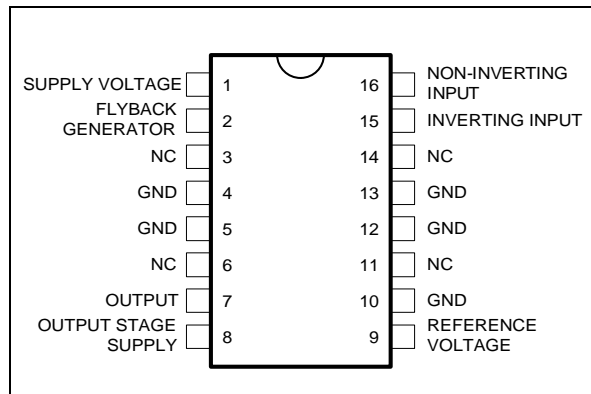


DESCRIPTION

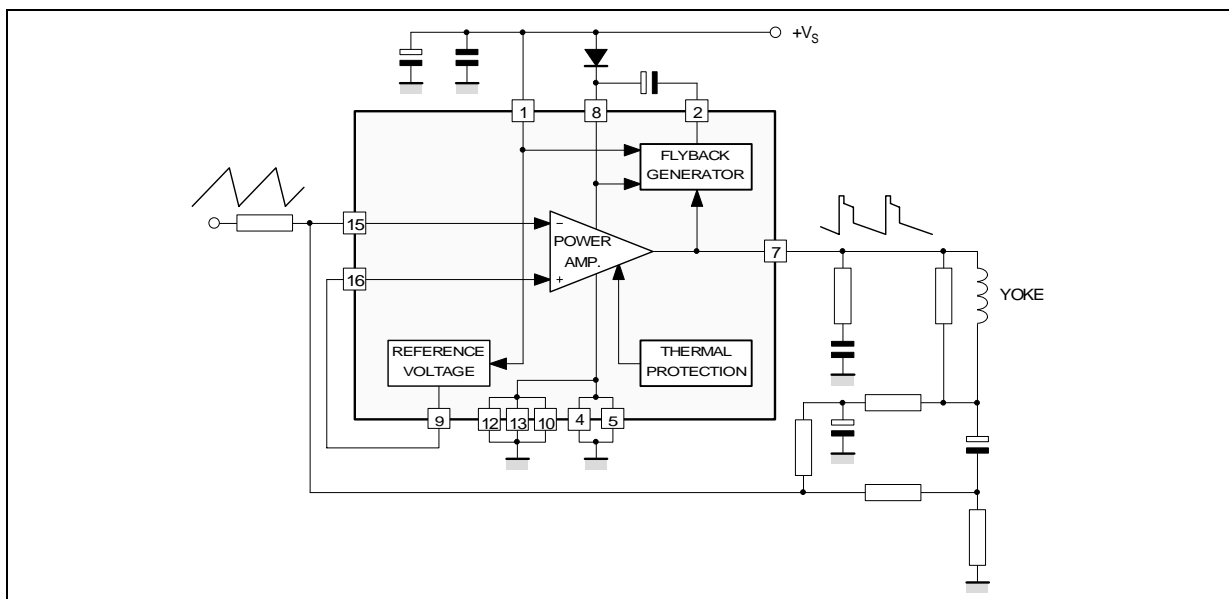
The TDA2270 is a high efficiency monolithic output stage for vertical deflection circuits in TVs and monitors. Driving the vertical windings directly, the device contains a power amplifier, flyback generator, voltage reference and thermal protection circuit.

The TDA2270 is supplied in a 16-pin DIP with the four center pins connected together and used for heatsinking.

PIN CONNECTIONS



BLOCK DIAGRAM



ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V _s	Supply Voltage (pin 1)	35	V
V ₇ , V ₈	Flyback Peak Voltage	60	V
V ₂	Voltage at Pin 2	+ V _s	
V ₁₅ , V ₁₆	Amplifier Input Voltage	+ V _s , - 0.5	V
I _o	Output Peak Current (non repetitive, t = 2 ms)	2	A
I _o	Output Peak Current at f = 50 Hz, t ≤ 10 μs	2.2	A
I _o	Output Peak Current at f = 50 Hz, t > 10 μs	1.2	A
I ₂	Pin 2 DC Current at V ₇ < V ₁	50	mA
I ₂	Pin 2 Peak to Peak Flyback Current at f = 50 Hz, t _{fly} ≤ 1.5 ms	2	A
P _{tot}	Total Power Dissipation at T _{pins} ≤ 90 °C T _{amb} = 70 °C	4.3 1	W W
T _{stg} , T _j	Storage and Junction Temperature	- 40 to 150	°C

2270-01.TBL

THERMAL DATA

Symbol	Parameter	Value	Unit
R _{th j-case}	Thermal Resistance Junction-case Max	14	°C/W
R _{th j-amb}	Thermal Resistance Junction-ambient Max	80	°C/W

2270-02.TBL

* Obtained with the GND pins soldered to printed circuit with minimized copper area.

ELECTRICAL CHARACTERISTICS

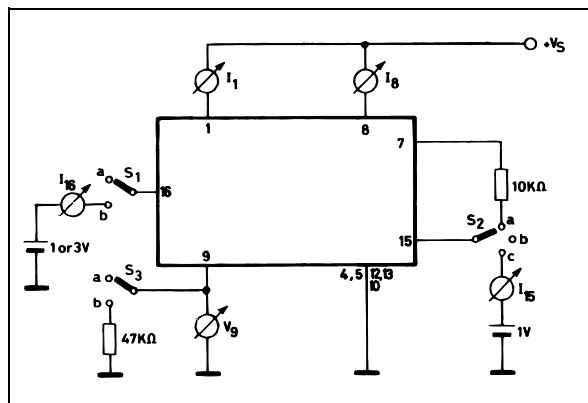
(refer to the test circuits, V_s = 35 V, T_{amb} = 25°C unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit	Fig.
I ₁	Pin 1 Quiescent Current	I ₂ = 0, I ₇ = 0, V ₁₆ = 3 V		8	16	mA	1a
I ₈	Pin 8 Quiescent Current	I ₂ = 0, I ₇ = 0, V ₁₆ = 3 V		16	36	mA	1a
I ₁₅	Amplifier Input Bias Current	V ₁₅ = 1 V		- 0.1	- 1	μA	1a
I ₁₆	Amplifier Input Bias Current	V ₁₆ = 1 V		- 0.1	- 1	μA	1a
V _{2L}	Pin 2 Saturation Voltage to GND	I ₂ = 20 mA		1		V	1c
V ₇	Quiescent Output Voltage	V _s = 35 V, R _a = 39 kΩ V _s = 15 V, R _a = 13 kΩ		18 7.5		V V	1d 1d
V _{7L}	Output Saturation Voltage to GND	I ₇ = 0.7 A		0.7	1	V	1c
V _{7H}	Output Saturation Voltage to Supply	- I ₇ = 0.7 A		1.3	1.8	V	1b
V ₉	Reference Voltage	I ₉ = 0		2.2		V	1a
$\frac{\Delta V_9}{\Delta V_s}$	Reference Voltage Drift versus Supply Voltage	V _s = 15 to 30 V		1	2	mV/V	1a
R ₉	Reference Voltage Output Resistance			2.1		kΩ	
T _j	Junction Temperature for Thermal Shut Down			140		°C	

2270-03.TBL

Figure 1 : DC Test Circuits

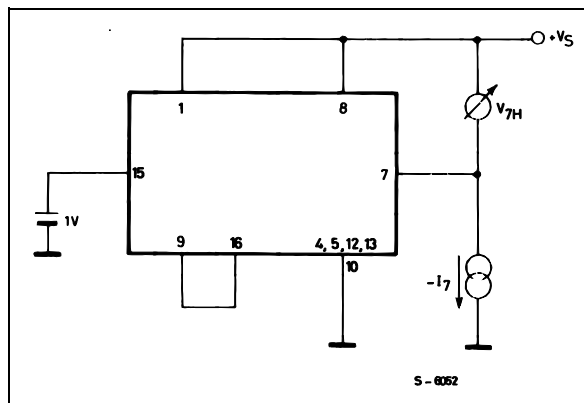
Figure 1a : Measurement of I_{I1} ; I_{I8} ; I_{I15} ; I_{I16} ; V_{V9} ; $\Delta V_9/\Delta V_S$; R_9



2270-03.EPS

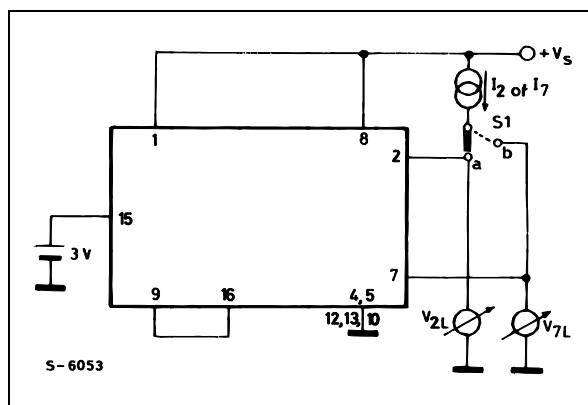
S1 : (a) I_{I15} ; (b) I_{I16} , I_{I7} and I_{I8} .
 S2 : (a) I_{I7} and I_{I8} ; (b) I_{I16} , (c) I_{I15} .
 S3 : (a) I_{I15} , I_{I16} , I_{I7} , I_{I8} , I_{I9} and V_{V9} ; (b) R_9

Figure 1b : Measurement of V_{7H}



2270-04.EPS

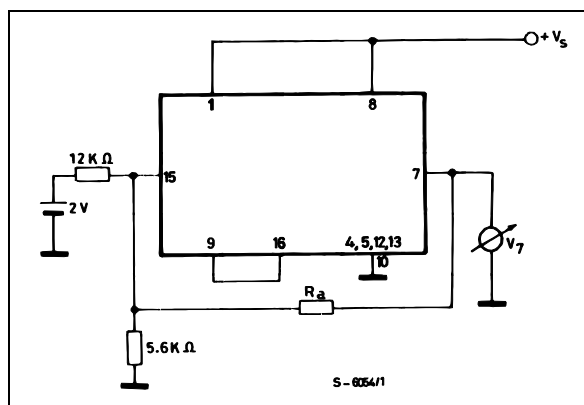
Figure 1c : Measurement of V_{2L} ; V_{7L}



2270-05.EPS

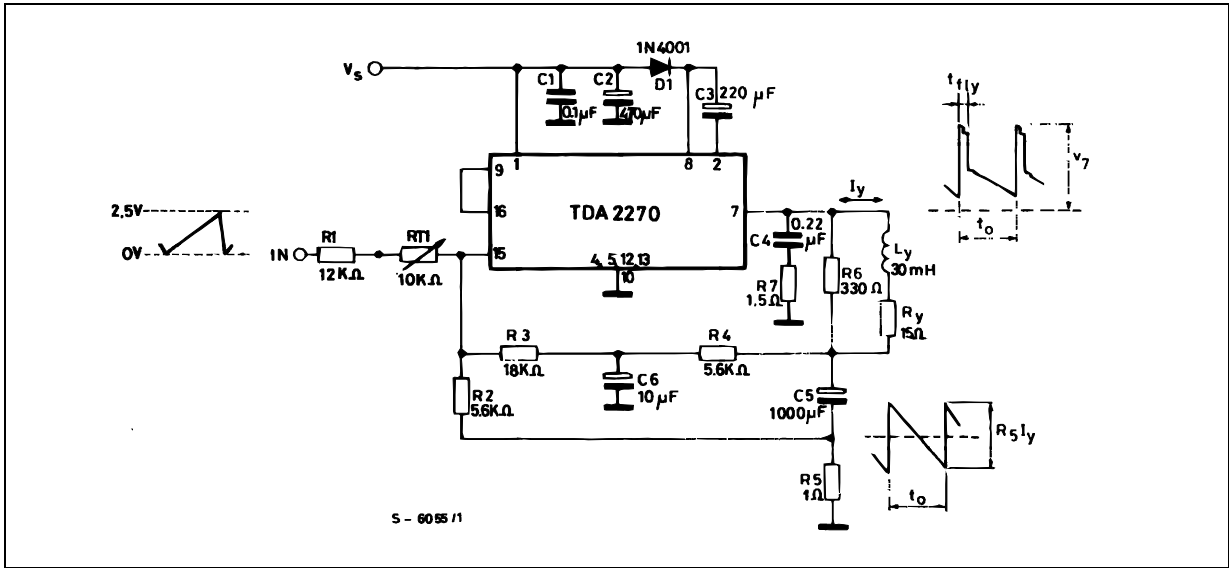
S1 : (a) V_{2L} ; (b) V_{7L}

Figure 1d : Measurement of V_7



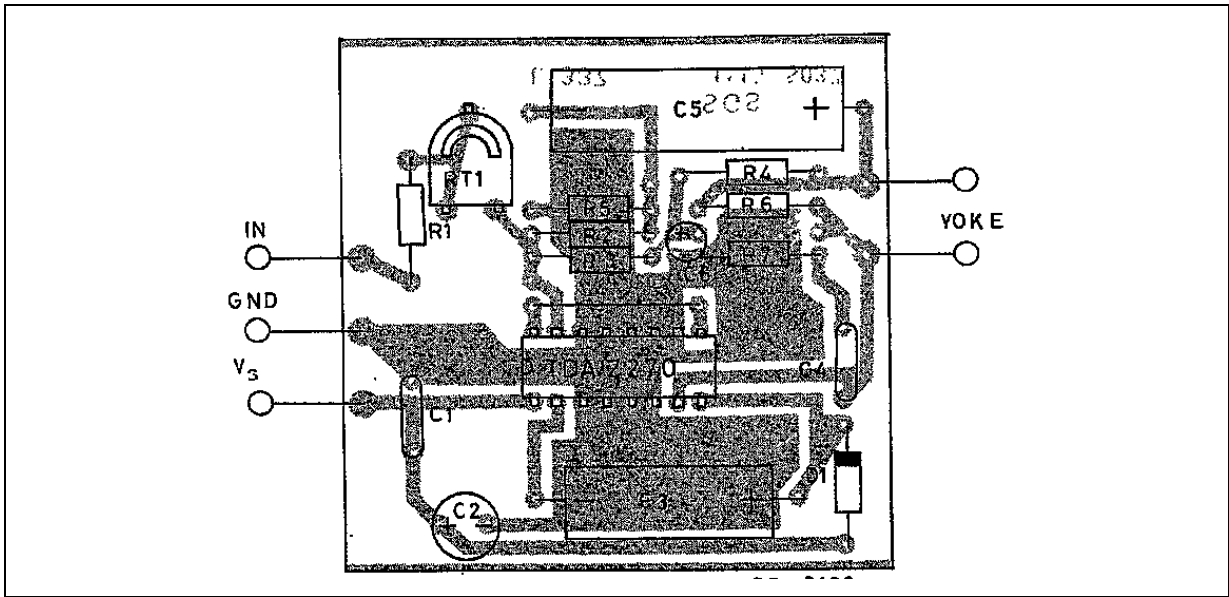
2270-06.EPS

Figure 2 : Application Circuit



2270-07.EPS

Figure 3 : PC Board and Component Layout (1 : 1 scale)



2270-08.TIF

COMPONENTS LIST FOR TYPICAL APPLICATIONS (refer to the fig. 2)

Component	B/W TV 10 Ω / 20 mH / 1 App	90° TVC 15 Ω / 30 mH / 0.82 App	Unit
RT1	10	10	k Ω
R1	10	12	k Ω
R2	5.6	5.6	k Ω
R3	15	18	k Ω
R4	6.8	5.6	k Ω
R5	1	1	Ω
R6	330	330	Ω
R7	1.5	1.5	Ω
D1	1N 4001	1N 4001	–
C1	0.1	0.1	μ F
C2 el.	470/25 V	470/25 V	μ F
C3 el.	220/25 V	220/25 V	μ F
C4	0.22	0.22	μ F
C5 el.	1000/25 V	1000/16 V	μ F
C6 el.	10/16 V	10/16 V	μ F

2270-04.TBL

TYPICAL PERFORMANCE

Parameter	B/W TV 10 Ω / 20 mH / 1 App	90° TVC 15 Ω / 30 mH	Unit
V_s – Supply Voltage	20	25	V
I_s – Current	145	125	mA
t_{fly} – Flyback Time	0.75	0.7	ms
* P_{tot} – Power Dissipation	1.8	2.05	W
* $R_{th\ c-a}$ – Heatsink	14	12	$^{\circ}$ C/W
T_{amb}	60	60	$^{\circ}$ C
$T_{j\ max}$	130	130	$^{\circ}$ C
t_o	20	20	ms
V_i	2.5	2.5	Vpp
V_7 – Flyback Voltage	42	52	Vp

2270-05.TBL

MOUNTING INSTRUCTIONS

The $R_{th\ j-amb}$ of the TDA 2270 can be reduced by soldering the GND pins to a suitable copper area of the printed circuit board (fig. 4) or to an external heatsink (fig. 5).

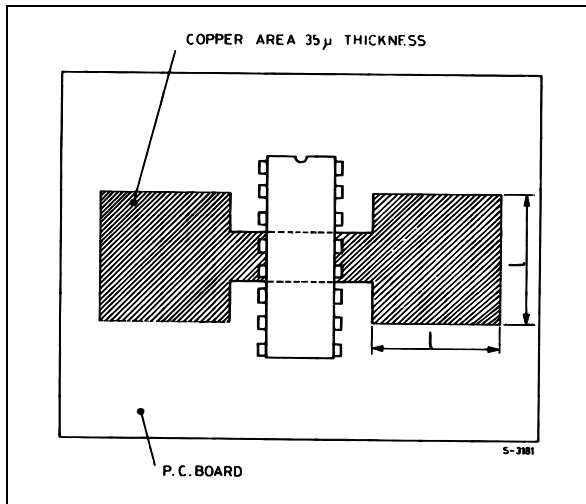
The diagram of figure 6 shows the maximum dissippable power P_{tot} and the $R_{th\ j-amb}$ as a function of the side "l" of two equal square copper areas having

a thickness of $35\ \mu$ (1.4 mils).

During soldering the pins temperature must not exceed $260\ ^\circ\text{C}$ and the soldering time must not be longer than 12 seconds.

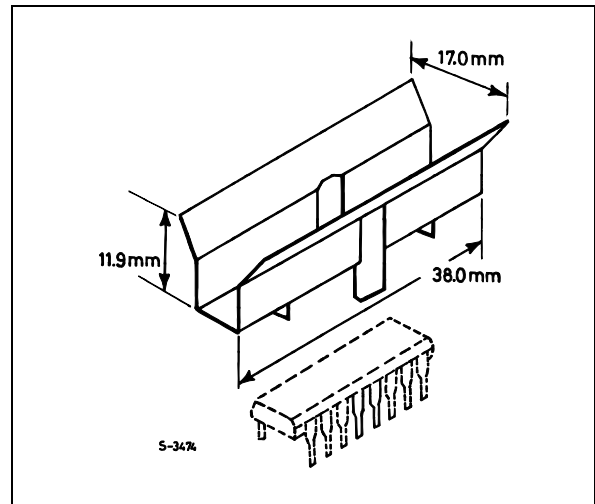
The external heatsink or printed circuit copper area must be connected to electrical ground.

Figure 4 : Example of P.C. Board Copper Area which is Used as Heatsink



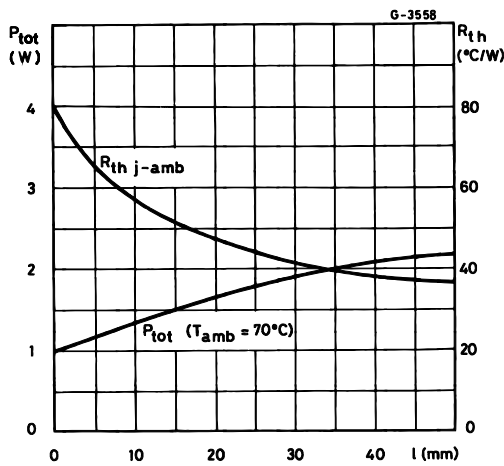
2270-09.EPS

Figure 5 : External Heatsink Mounting Example



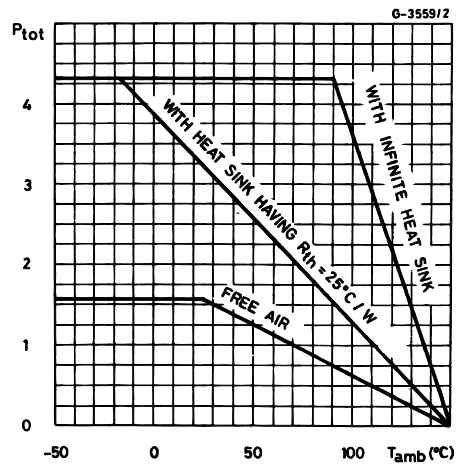
2270-10.EPS

Figure 6 : Maximum Dissippable Power and Junction to Ambient Thermal Resistance versus Side "l"

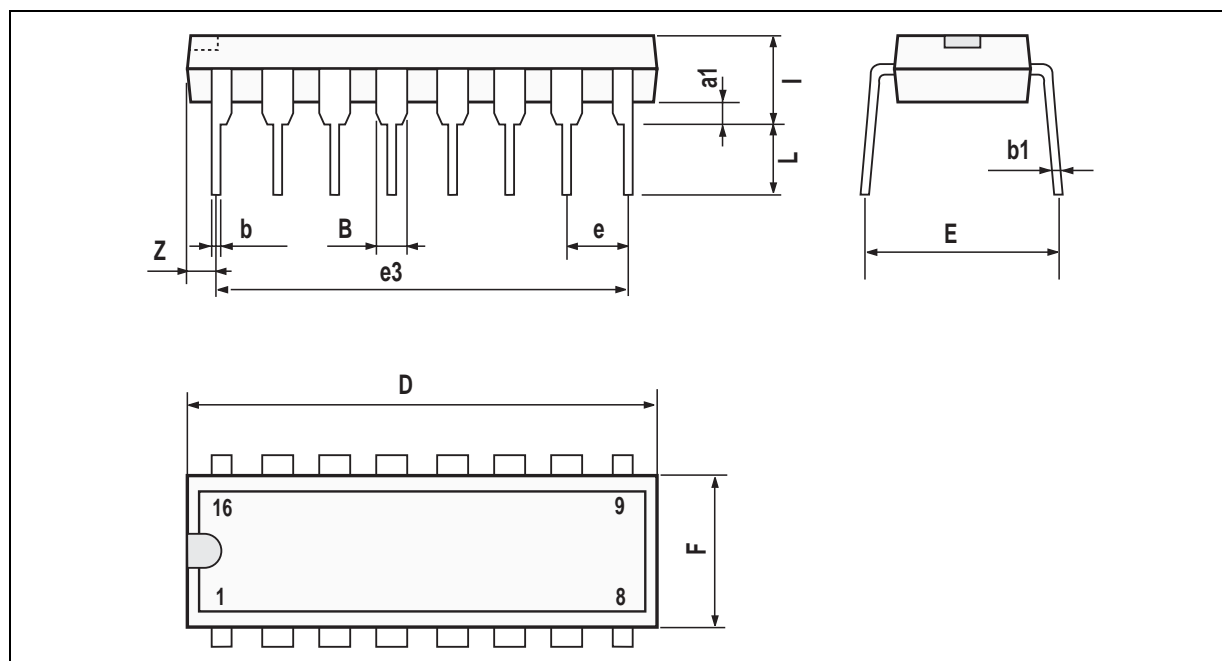


2270-11.EPS

Figure 7 : Maximum Allowable Power Dissipation versus Ambient Temperature



2270-12.EPS

PACKAGE MECHANICAL DATA
 16 PINS - PLASTIC DIP


PM-DIP16.EPS

Dimensions	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
a1	0.51			0.020		
B	0.77		1.65	0.030		0.065
b		0.5			0.020	
b1		0.25			0.010	
D			20			0.787
E		8.5			0.335	
e		2.54			0.100	
e3		17.78			0.700	
F			7.1			0.280
i			5.1			0.201
L		3.3			0.130	
Z			1.27			0.050

DIP16.TBL

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