

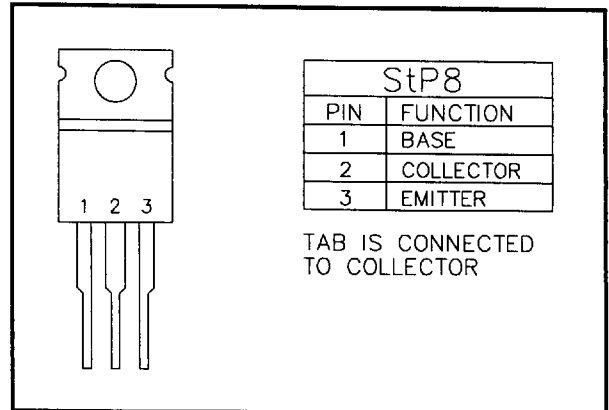
APPLICATIONS

- Pentium Processor™ supplies
- PowerPC™ supplies
- Other 2.5 V to 3.6 V microprocessor supplies
- Low voltage logic supplies
- Post regulator for switching supplies

DESCRIPTION

The StP8 is a passivated epitaxial planar silicon device intended for use in high power applications

PIN CONFIGURATION



ORDERING INFORMATION

DEVICE	PACKAGE
StP8	TO-220

ABSOLUTE MAXIMUM RATINGS

Rating	Symbol	Conditions	Value	Unit
Collector-Emitter Voltage	V_{CEO}	$I_C = 100 \text{ mA}$, $t_p = 300 \mu\text{s}$	10	V
Emitter-Base Voltage	V_{EBO}	$I_E = 1 \text{ mA}$	5	V
Collector Current - Continuous	I_C		10	A
Total Power Dissipation @ $T_C = 25 \text{ }^\circ\text{C}$	P_D		60	W
Derate Above $25 \text{ }^\circ\text{C}$			0.48	$^\circ\text{C/W}$
Operating and Storage Junction Temperature Range	T_j , T_{stg}		-65 to 150	$^\circ\text{C}$

THERMAL CHARACTERISTICS

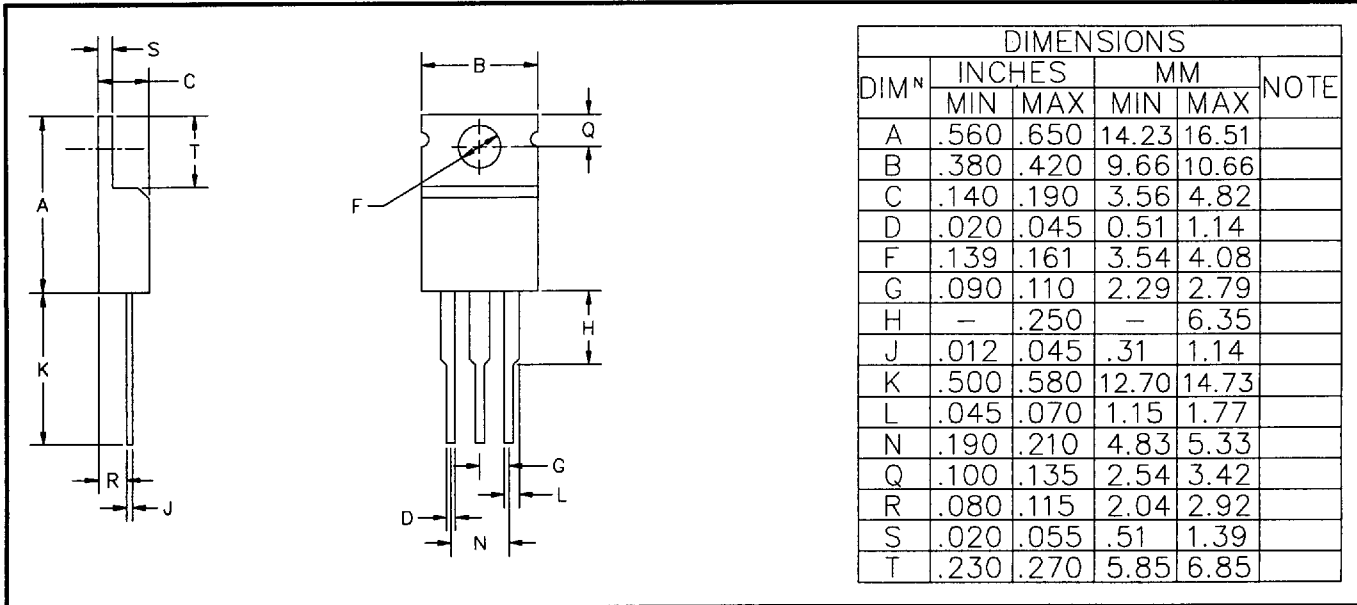
Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	R_{th-j-c}	2.0	$^\circ\text{C/W}$
Maximum Lead Temperature For Soldering Purposes: 1/8" From Body For 5 Seconds	T_L	275	$^\circ\text{C}$

ELECTRICAL CHARACTERISTICS

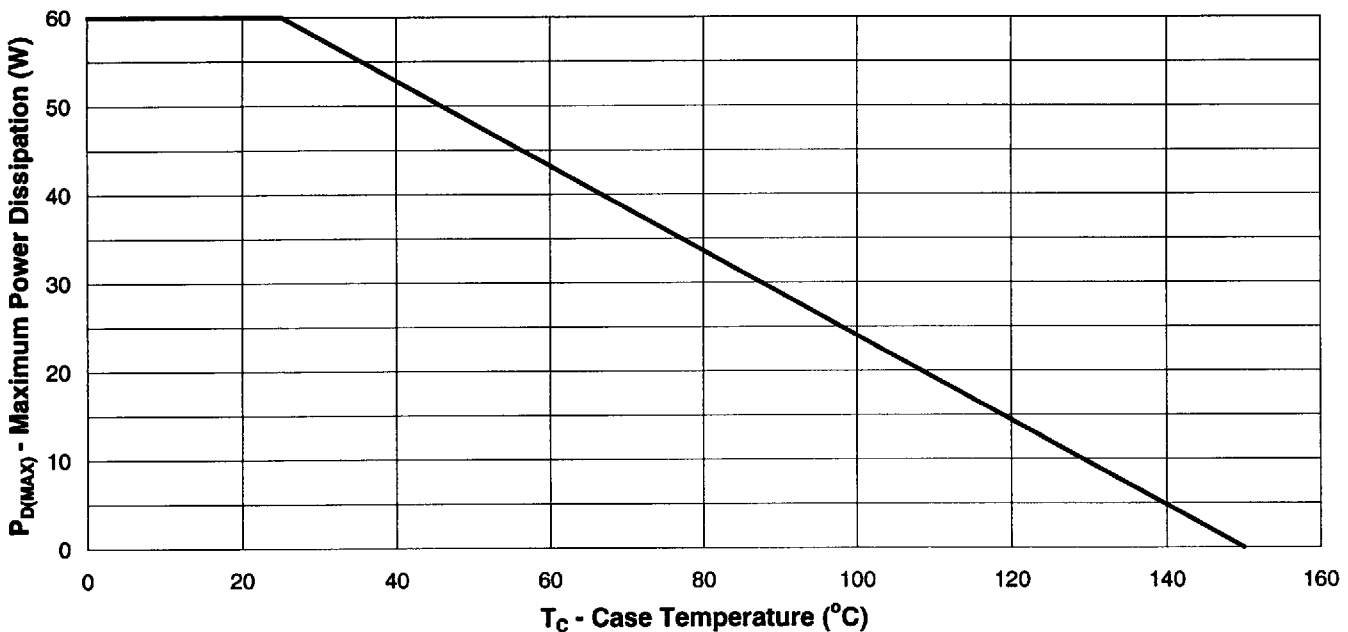
Characteristic	Symbol	Conditions	Min	Typ	Max	Unit
Inverse Collector-Emitter Current	I_{CES}	$V_{CE} = 10 \text{ V}$			5	μA
Inverse Emitter-Base Current	I_{EBO}	$V_{EB} = 5 \text{ V}$			5	μA
Collector-Emitter Saturation Voltage	$V_{CE(SAT)}$	$I_C = 10 \text{ A}$, $I_B = 1 \text{ A}$, Note 1		0.6	1.0	V
Collector-Base Saturation Voltage	$V_{BE(SAT)}$	$I_C = 10 \text{ A}$, $I_B = 1 \text{ A}$, Note 1		1.3	1.5	V
DC Current Gain	h_{FE}	$I_C = 10 \text{ A}$, $V_{CE} = 5 \text{ V}$, Note 1	100	130		
		$I_C = 10 \text{ A}$, $V_{CE} = 1.47 \text{ V}$, Note 1	90	100		

Note 1: $t_p = 300 \mu\text{s}$

OUTLINE AND DIMENSIONS- TO-220 PACKAGE

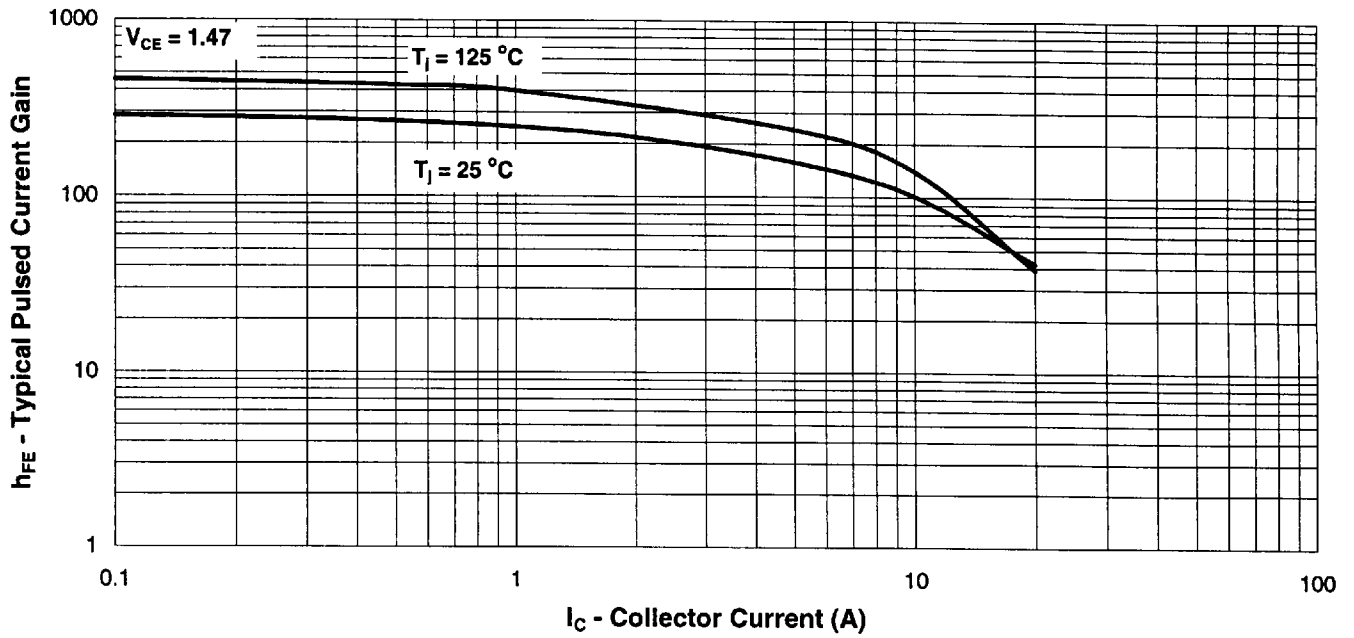


Maximum Power Dissipation vs. Case Temperature

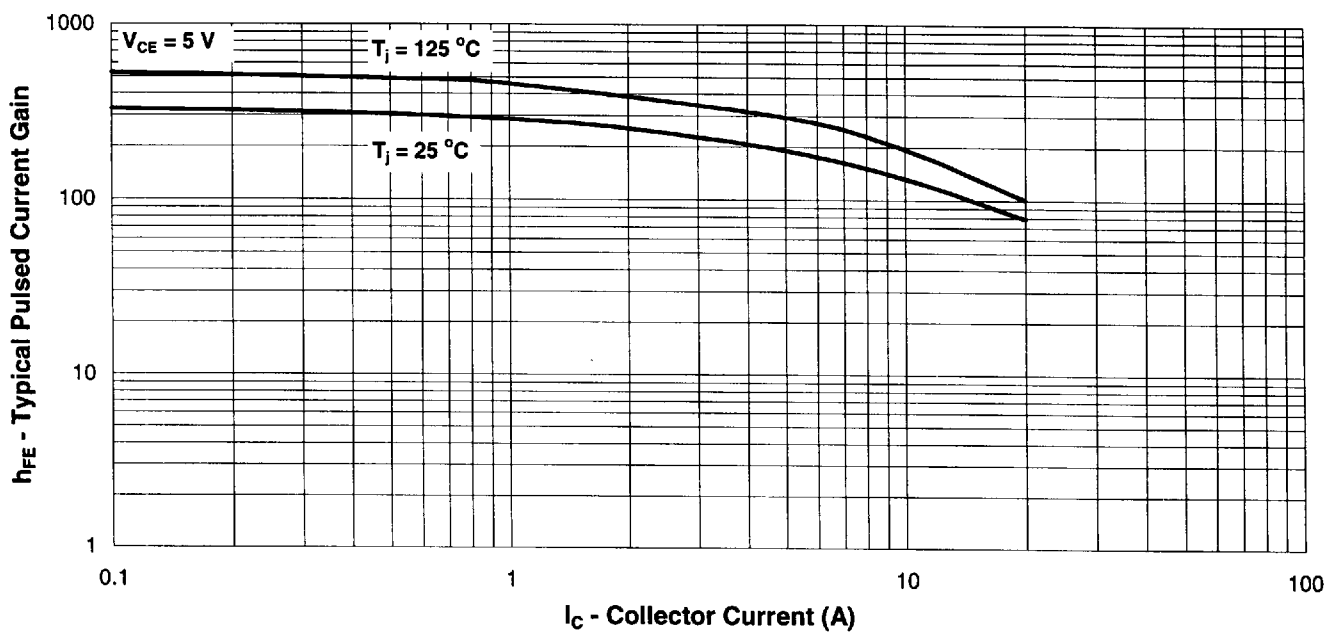


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Typical Pulsed Current Gain vs. Collector Current

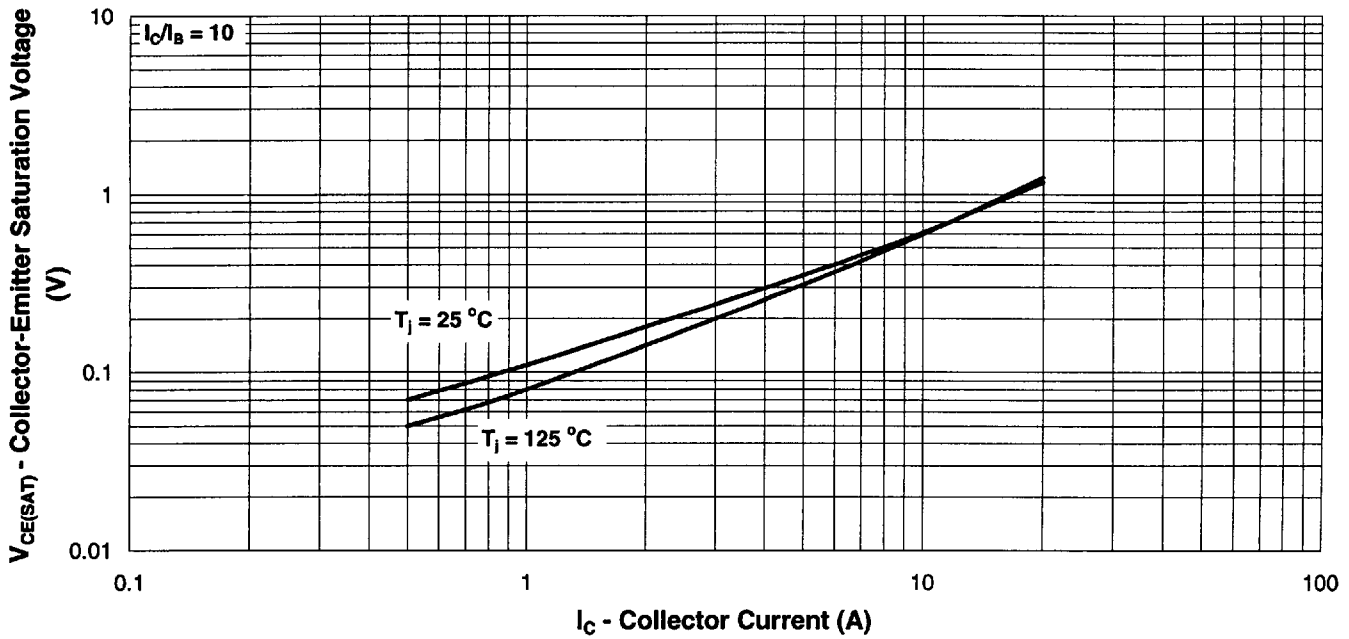


Typical Pulsed Current Gain vs. Collector Current

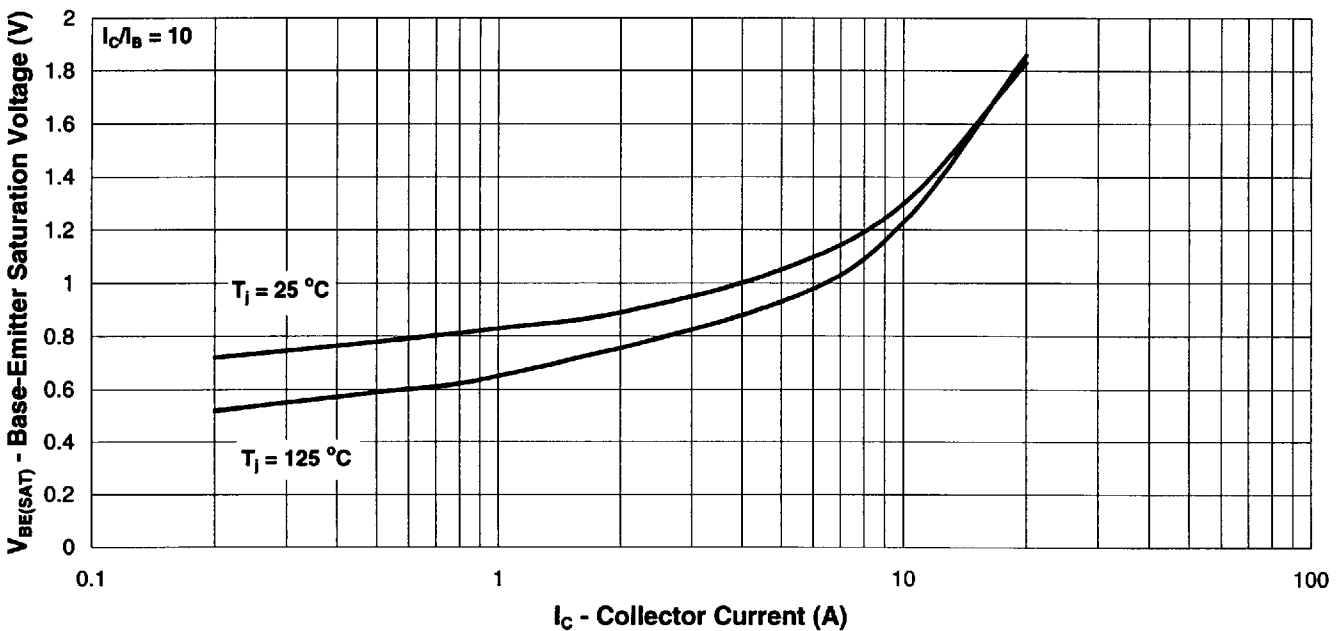


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Typical Collector-Emitter Saturation Voltage vs. Collector Current

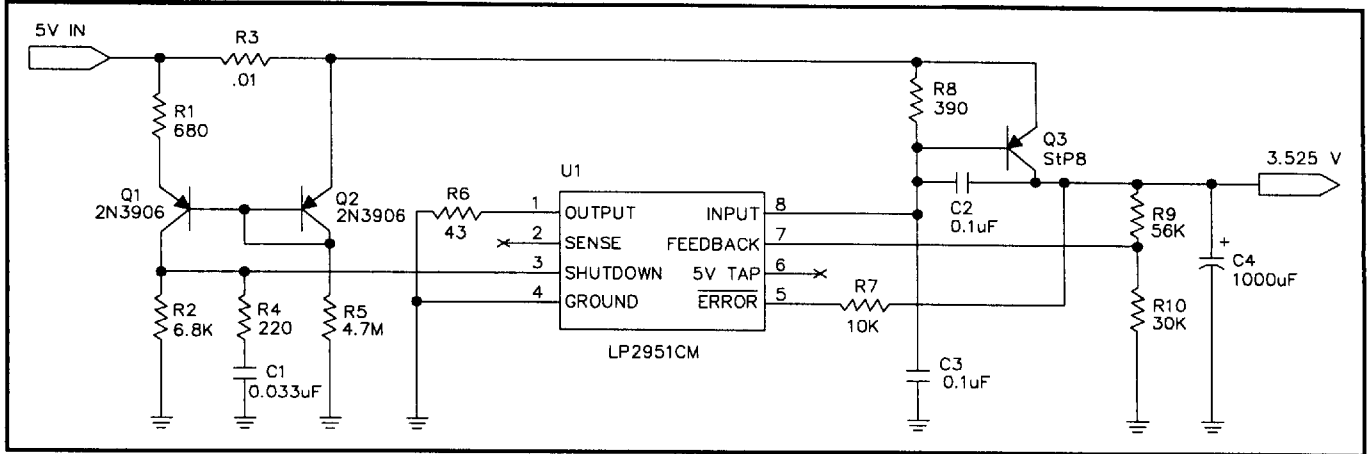


Typical Base-Emitter Saturation Voltage vs. Collector Current

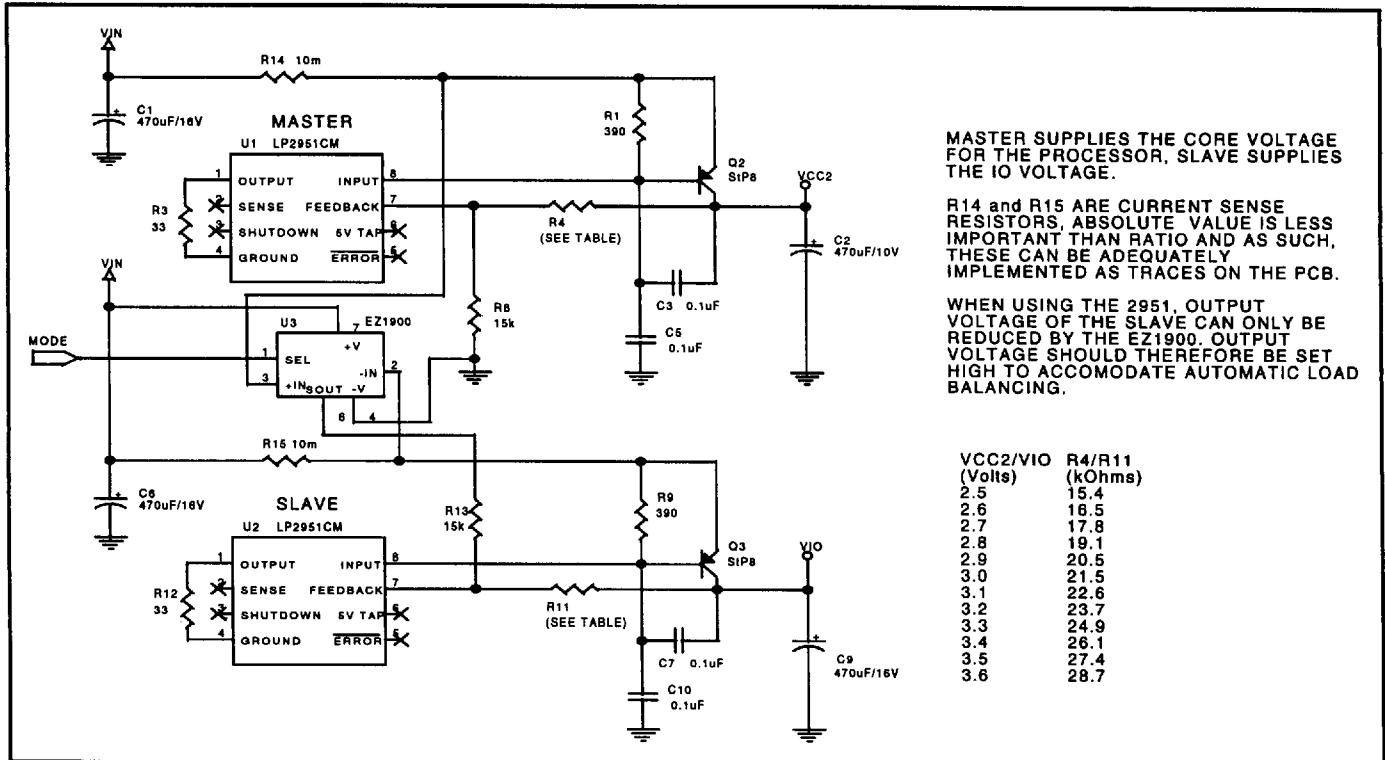


TYPICAL APPLICATIONS

3.525V, 8 Amp Low Dropout Regulator



General Load Balance Circuit



EZ1900 and LP2951CM are available from Semtech
Please contact your Semtech Sales Representative

Thermal Considerations

A heatsink is required for the transistor when used in either of the application circuits given. The following precalculated values are based on an output voltage of 3V and assume the transistor is mounted directly to the heatsink with thermal grease (uninsulated).

Output Current (Amps)	R _{THS-A} for T _A =25°C (°C/W)	R _{THS-A} for T _A =70°C (°C/W)
2A	20.0	12.5
4A	10.0	5.0
6A	5.0	2.5
8A	2.5	1.0

Heatsink Calculation

The following equation may be used to calculate heatsink needs for applications not specified above.

$$R_{THS-A} = (150 - T_{A(MAX)}) / ((V_{in(MAX)} - V_{o(MIN)}) I_O) - R_{THJ-C} - R_{THC-S}$$

Where:

R_{THS-A} = Heatsink thermal impedance case to sink (°C/W)

T_{A(MAX)} = Maximum ambient temperature (°C)

V_{in(MAX)} = Maximum Input Voltage (V)

V_{o(MIN)} = Minimum Output Voltage (V)

I_O = Maximum continuous output current (A)

R_{THJ-C} = Transistor thermal impedance junction-to-case = 2°C/W

R_{THC-S} = Thermal impedance case-to-sink = 0.5°C/W.