

Title	<i>Eng Report - T.V. STANDBY 7.5V,0.18A, 1.3W prototype Board</i>
Recipients	
Customer	
Author	Doug Kang.
Date	01-DEC-98

Abstract

This document describes the specification for the a prototype of TV Standby High Efficient power supply. The document contains the requirements specification.

Lastly the document contains the real measured performance of the circuit .

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Introduction

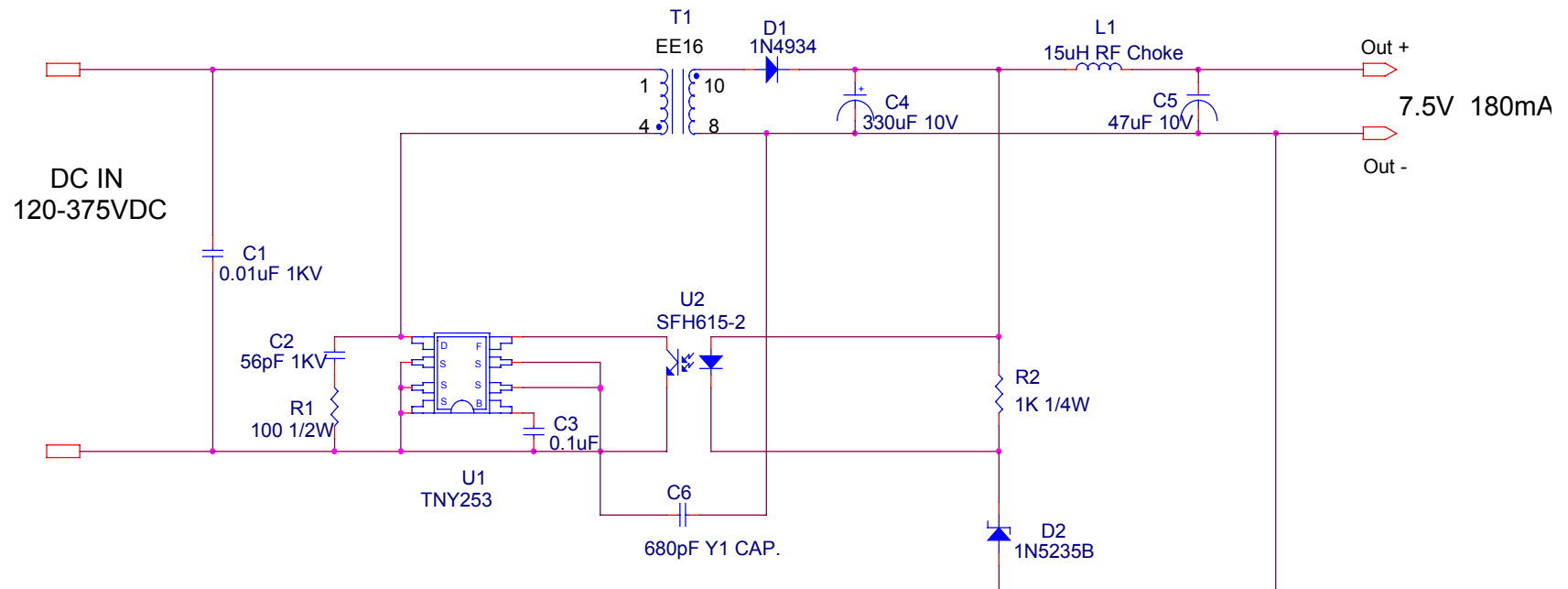
This document describes the specification for the prototype of TV Standby 1.3W power supply.

2.0 Power Supply Requirements Specification

Connect or pin	Description	Symbol	Min	max	Units	comment
VTA, Neutral	Input					
	Input Voltage	Vdc	120	375	Vdc	
+7.5Vout, 0Vout	Output					
	Output Voltage	Vout	7.2	7.8	V	7.5V+-5% *
	Output Ripple Voltage	Vout_ripple	-50	+50	mV	@ full load*
	Output Current	Iout	0	0.18	A	
	Total Power Output					
	Continuous Output power	Pout_total		1.3	W	
	Power supply efficiency	η	70		%	@ full load

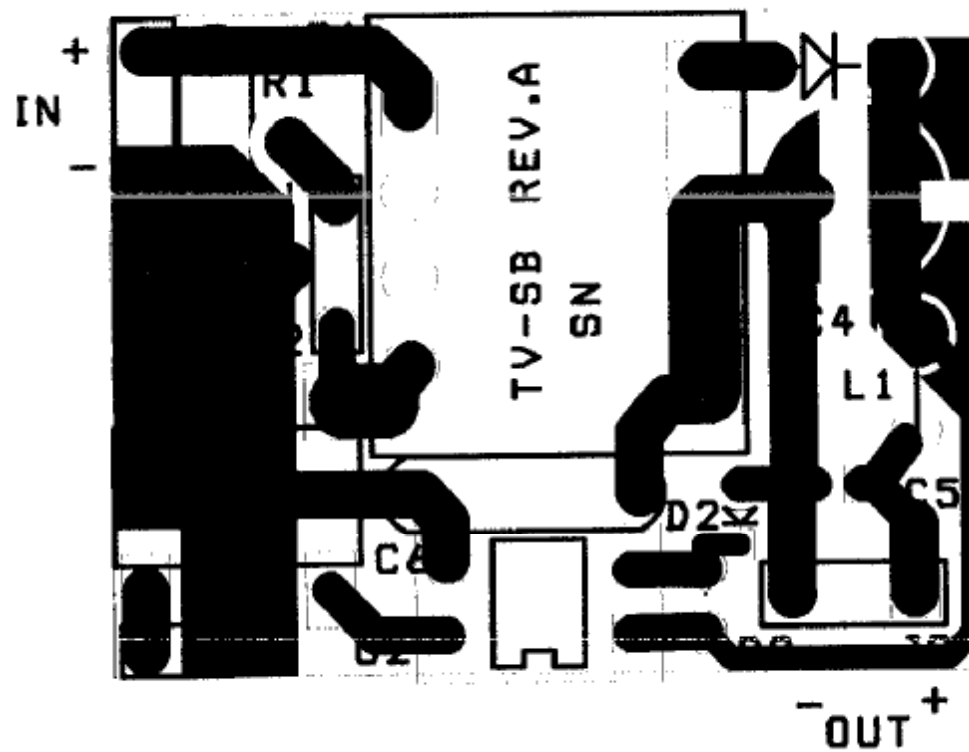


3.0 Schematic

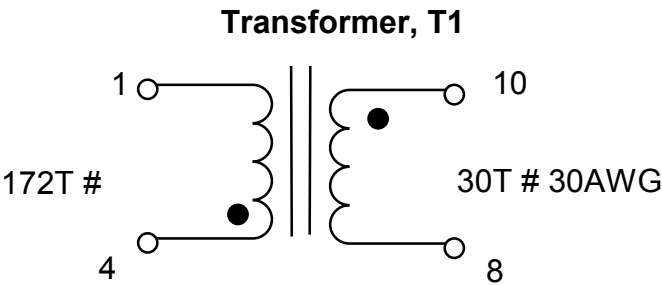


3.1 Layout

Expanded View



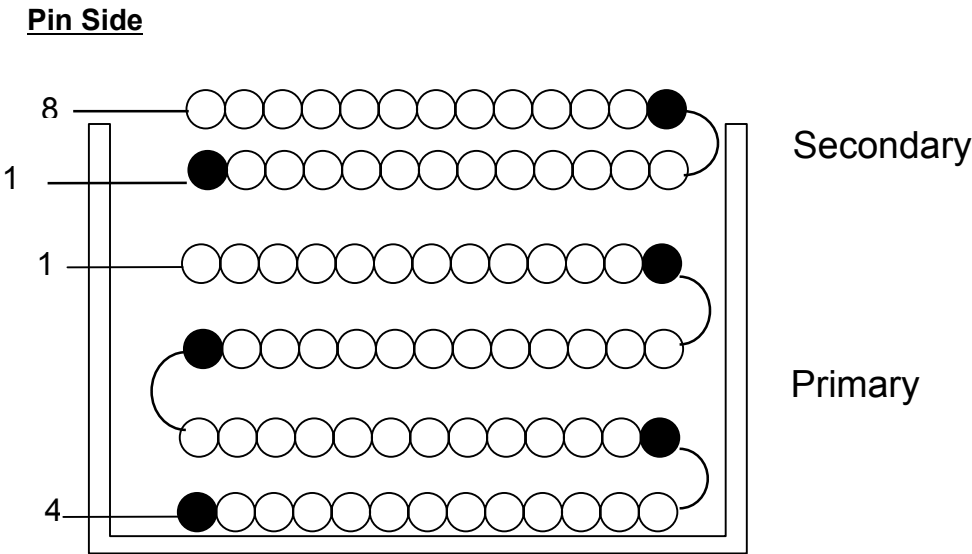
4.0 Transformer Drawing



Electrical Specifications

Electrical Strength	60Hz 1 minute, from Pins 1-4 to 5-10	3000 VAC
Primary Inductance (measured at 44kHz)	All windings open	5000uH +/- 200uH
Resonant Frequency	All windings open	300kHz (Min.)
Primary Leakage Inductance	Pins 8 -10 shorted	100uH max

Transformer Construction



Winding Instructions



- The transformer has **NO TAPE** anywhere in the transformer construction.
- The primary wire gauge is AWG 36 is **double enameled** (also known as heavy Nyleze).
- Please if possible reduce the tension of wire for primary winding.

Primary Layer	Start at Pin 4. Wind 54 turns of item [3] from left to right. Wind uniformly, in a single layer, across entire width of bobbin. Wind 54 turns in the next layer from right to left. Wind 54 turns in the next layer from left to right. Wind remaining 10 turns in the next layer from right to left. Finish on Pin 1.
Secondary Winding	Start at Pin 10. Wind 15 turns of item [4] from left to right. Wind uniformly, in a single layer, across entire width of bobbin. Wind remaining 15 turns in the next layer from right to left. Finish on Pin 8.
Final Assembly	Glue cores per recommended transformer construction guideline in www.powerint.com

Materials

Item	Description
[1]	Core: EE16, Gapped for AL of 170 nH/T^2
[2]	Bobbin: 10 Pin EE-16, Ying Chin YC1607 or equiv.
[3]	Magnet Wire: # 36AWG Heavy Nyleze
[4]	Triple Insulated Wire: # 30 AWG



Design Notes:

Power Integrations Device	TNY253
Frequency of Operation	44 KHz
Mode	Discontinuous
Reflected Voltage (Secondary to Primary)	48V
Maximum DC Input	375V
Minimum DC Input	120V



5.0 Test Results

5.1 Power Efficient Measurement Test Data

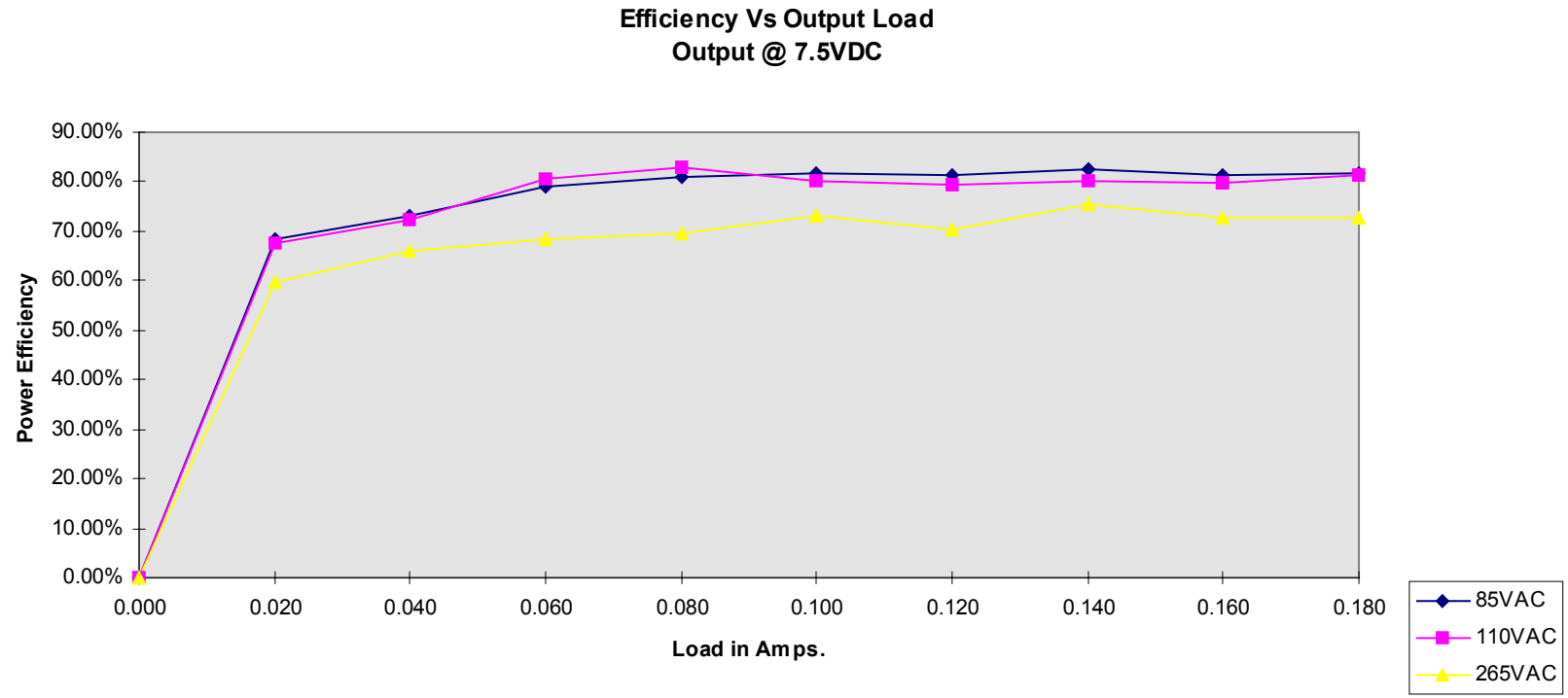
TEST EQUIPMENT INPUT AC POWER ANALYSER PM1000 FROM VOLTECH.
OUTPUT ELECTRONIC LOAD FROM KIKUSUI.

V(AC)in	P(W)in	V(DC) out	Load(A)	P(W) out	Power Eff.(%)
85	0.027	7.81	0.000	0.000	0.00%
85	0.228	7.79	0.020	0.156	68.33%
85	0.426	7.78	0.040	0.311	73.05%
85	0.589	7.77	0.060	0.466	79.15%
85	0.764	7.75	0.080	0.620	81.15%
85	0.948	7.74	0.100	0.774	81.65%
85	1.138	7.73	0.120	0.928	81.51%
85	1.312	7.72	0.140	1.081	82.38%
85	1.516	7.71	0.160	1.234	81.37%
85	1.696	7.70	0.180	1.386	81.72%

V(AC)in	P(W)in	V(DC) out	Load(A)	P(W) out	Power Eff.(%)
110	0.040	7.81	0.000	0.000	0.00%
110	0.230	7.79	0.020	0.156	67.74%
110	0.430	7.78	0.040	0.311	72.37%
110	0.580	7.77	0.060	0.466	80.38%
110	0.750	7.76	0.080	0.621	82.77%
110	0.967	7.74	0.100	0.774	80.04%
110	1.169	7.73	0.120	0.928	79.35%
110	1.350	7.72	0.140	1.081	80.06%
110	1.550	7.71	0.160	1.234	79.59%
110	1.700	7.70	0.180	1.386	81.53%

V(AC)in	P(W)in	V(DC) out	Load(A)	P(W) out	Power Eff.(%)
265	0.080	7.82	0.000	0.000	0.00%
265	0.260	7.79	0.020	0.156	59.92%
265	0.470	7.78	0.040	0.311	66.21%
265	0.680	7.76	0.060	0.466	68.47%
265	0.890	7.75	0.080	0.620	69.66%
265	1.060	7.74	0.100	0.774	73.02%
265	1.320	7.72	0.120	0.926	70.18%
265	1.430	7.71	0.140	1.079	75.48%
265	1.690	7.70	0.160	1.232	72.90%
265	1.900	7.69	0.180	1.384	72.85%





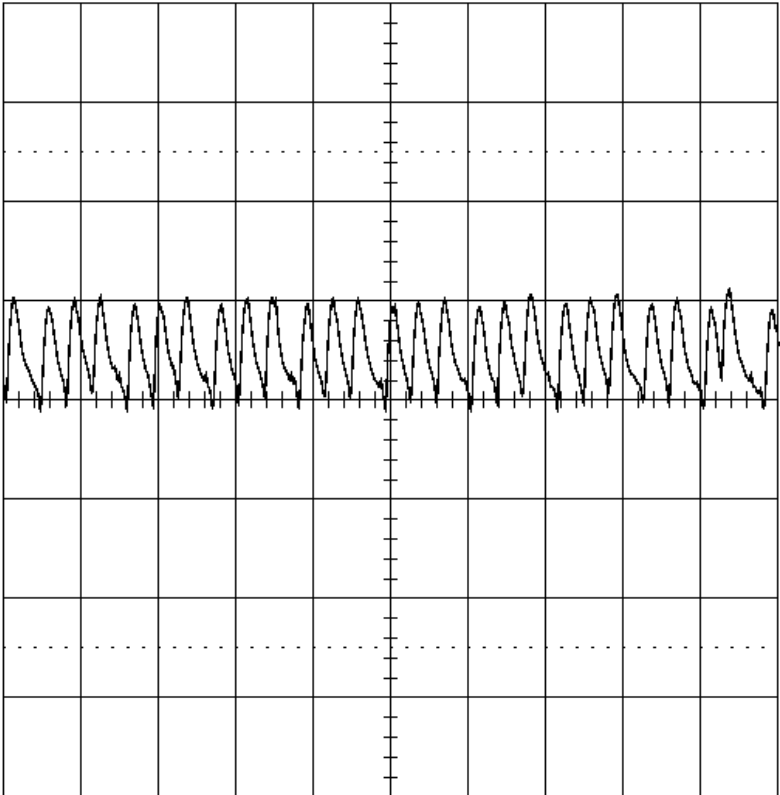
5.2 Test Data

7.5V OUTPUT RIPPLE WAVE FORM @ 0.18A LOAD, 375VDC

19-Aug-98
15:15:53

3

.1 ms
50 mV



.1 ms BWL

- 1

20 mV

AC

$\times_{100}$
- 2

10 mV

50 Ω
- 3

5 mV

AC

$\times_{10}$
- 4

.2 V

DC

$\times_{10}$



2 DC 4.8 mV

HARDCOPY

output to

Int. Printer

Flpy

GPIB

RS232

Centronics

page feed

OFF

 On

protocol

HP 7470

HP 7550

TIFF

TIFF compr.

BMP

100 MS/s

☐ AUTO



7.5V OUTPUT TURN ON VOLTAGE WAVE FORM @ 0.18A LOAD,375VDC

19-Aug-98
15:17:32

TRIGGER SETUP

3

5 ms
2.00 V

Edge

SMART

trigger on

1 2 3 4 Ext

Ext10 Line

coupling 3

DC AC LFREJ

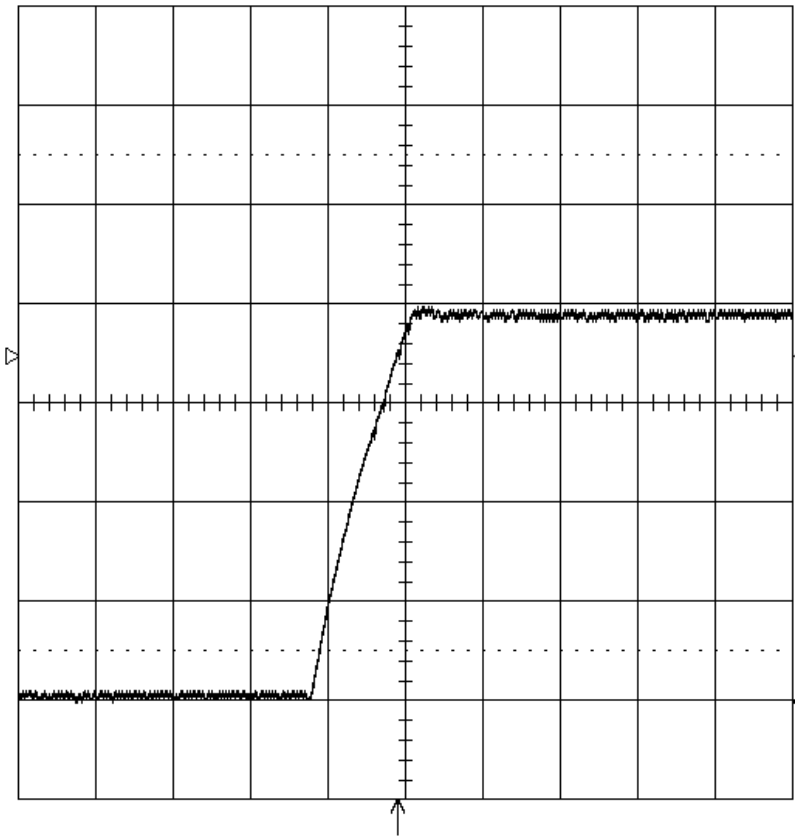
HFREJ HF

slope 3

Pos Neg

holdoff

OFF Time Evt



- 5 ms BWL
- 1 20 mV AC $\times_{100}$
- 2 10 mV 50 Ω
- 3 .2 V DC $\times_{10}$
- 4 .2 V DC $\times_{10}$

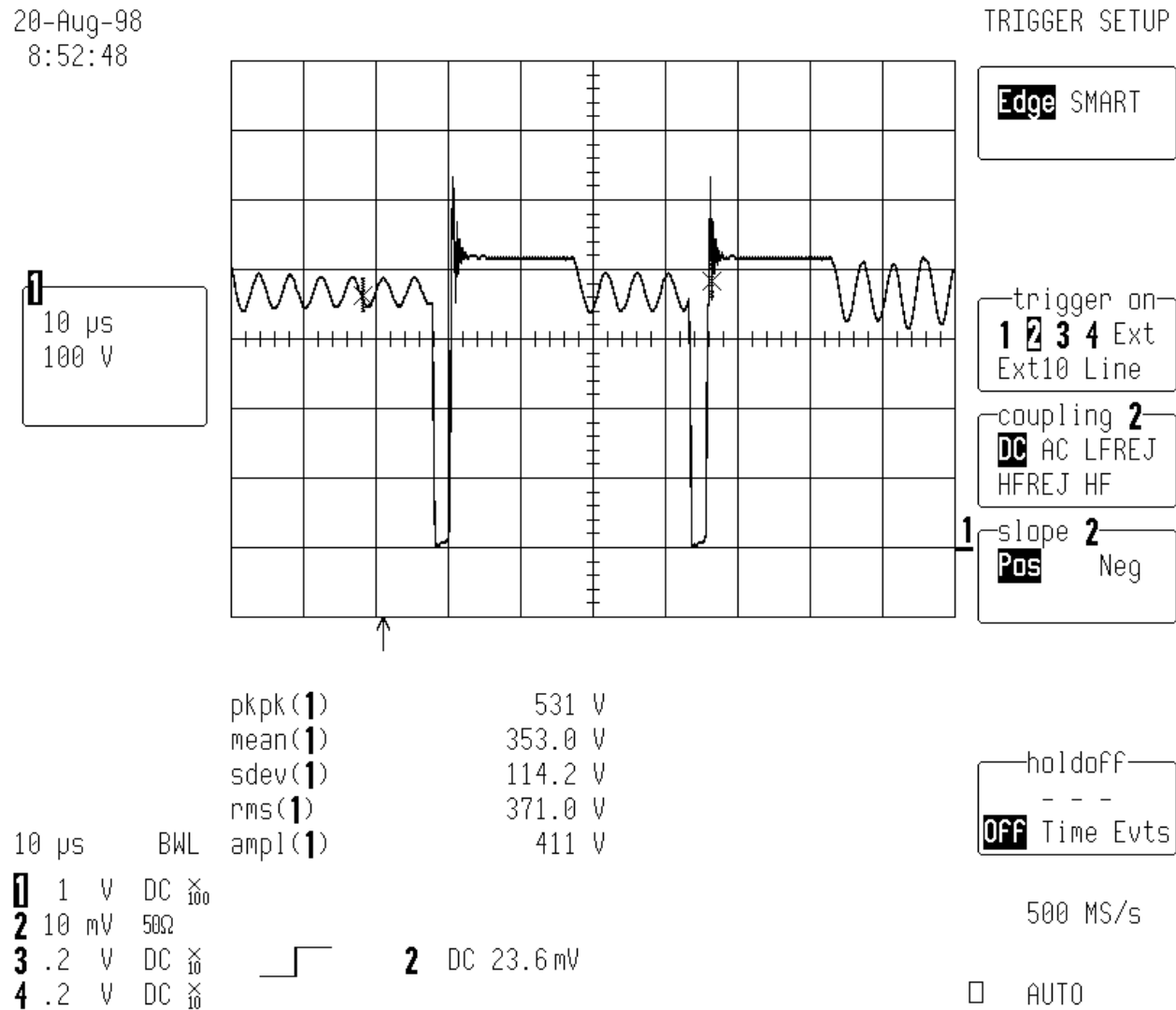
 3 DC 6.96 V

2 MS/s

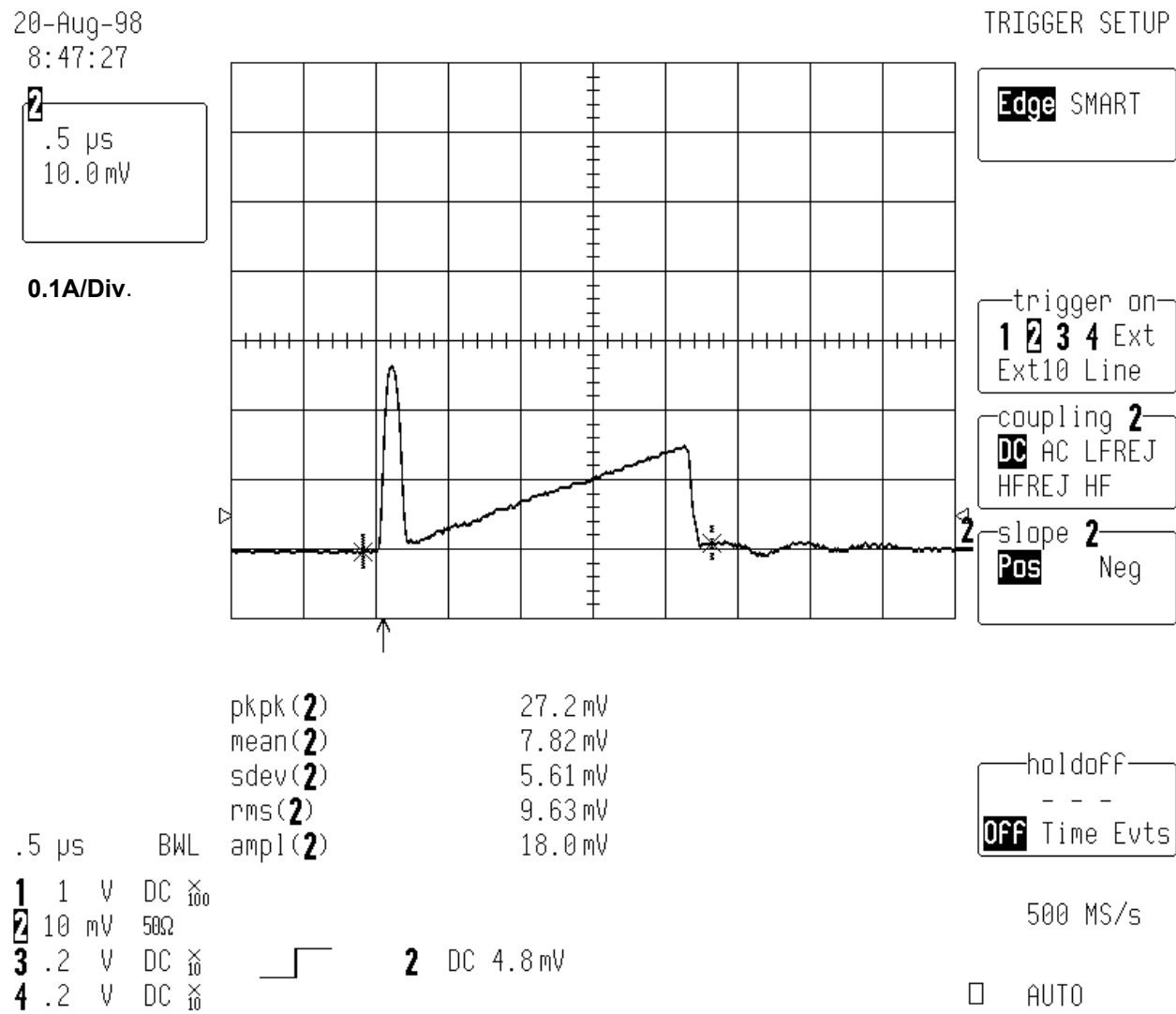
☐ NORMAL



TINY SWITCH-253 DRAIN TO SOURCE WAVEFORM @ 0.18A ,375VDC



TINY SWITCH-253 DRAIN TO SOURCE CURRENT WAVEFORM @ 0.18A ,375VDC



6.0 BILL OF MATERIALS.

Bill Of Materials

Item	Quantity	Reference	Part
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1	1	C1	0.01uF 1KV
2	1	C2	56pF 1KV
3	1	C3	0.1uF
4	1	C4	330uF 10V
5	1	C5	47uF 10V
6	1	C6	680pF Y1 CAP.
7	1	D1	1N4934
8	1	D2	1N5235B
9	1	L1	15uH RF Choke
10	1	R1	100 1/2W
11	1	R2	1K 1/4W
12	1	T1	TRANSFORMER
13	1	U1	TNY253
14	1	U2	SFH615-2



Author	Date	Description
Doug Kang	12/01/98	First Draft

