

Re: tektronix 2235 , blown switchmode

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From: Jim Yanik (jyanik_at_abuse.gov)

Date: 07/16/04

Date: Fri, 16 Jul 2004 23:47:27 +0000 (UTC)

john <john@removeagent-j.thiscom> wrote in
news:opsa8wpymt64p9b0@funkmeister.agent-j.com:

- > *Hi Jim,*
- > *thanks to both you and Jules for the fast response*
- > *From what i see, the tranny (Q908)thats blown has completely blown*
- > *its top*
- > *off and i can understand why...*
- > *The fet blew, shorting gate to drain... hence all the current went*
- > *through this poor little guy (Q908, to-92 package).. frying it, the*
- > *diode CR908 and R909.*
- >
- > *the Snippet sent to me by Julian, has no R909, which is whats written*
- > *on my PCB and therefore i think there are one or two version*
- > *differences, as mine is the 220V version.*
- > *The remaining band on the resistor is an orange (3xxx) which makes*
- > *me think it is a 3k.*

Well,I'm working from my 2213/15 manual,but the PS circuitry is almost identical. There mare 47 ohm Resistors in the bases of the power osc xstrs,those can open when one of the xstrs fails.The 1 ohm ww resistor I mentioned is in the emitter of both the power osc xstrs.It is very common to fail.

Perhaps your crowbar circuit is what failed.

This is an overvoltage circuit that is supposed to put the pre-reg into 'burst' mode(current limit) by drawing a large current thru the SCR.

There's a 3 ohm,3w,5% ww R in that circuit along with a SCR (Q935,151-0506-00,C106B2X283 mfg p/n) and a 51V zener,0.4w,5%.

- >
- > *any more clues as i'm going to get the parts now and replace and then*
- > *fire up ;)*
- >
- >
- >
- > *On Fri, 16 Jul 2004 00:16:25 +0000 (UTC), Jim Yanik <jyanik@abuse.gov>*
- > *wrote:*

>
>> john <john@agent-j.com> wrote in
>> news:opsa7aefh90tb1i5@funkmeister.agent-j.com:
>>
>>>
>>> Hi All!
>>>
>>> I have an old 2235 'scope which has died on me.
>>> It looks like the resistor R909 and Q908 are fried . It also looks
>>> like the IRF820 (on heatsink) is blown.
>>> Can anyone help with an excerpt from a service manual (diag) or
>>> part numbers/values ?
>>>
>>> Does this happen often with these babies ?
>>>
>>> Regards
>>>
>>> John
>>>
>>
>> here's some data I compiled while at TEK;
>>
>> TO-220 FET SPECS
>>
>> +
>> 151-1136-00 MTP12N10E 100V 0.16ohm 14.0A
>> 151-1141-00 IRF730,STP300H 400V 1.0 ohm 5.5A
>> 151-1151-00 IRF710/MTP3N40 400V 3.6 ohm 1.5A
>> 151-1152-00 IRF820/MTP475 500V 3.0 ohm 2.5A
>> 151-1171-00 BUZ71A/MTP15N05E 50V 0.12ohm 14 A
>> 151-1214-01 IRF830 500V 1.5 ohm 4.5A
>> 151-1245-00 MTP6N60E 600V 1.2 ohm 6.0A
>> 151-1286-00 MTP4N80E/BUK456-800 800V 3.0ohm 4.0A
>>
>>
>>
>> The Molex connector to the pre-reg FET(IRF-820) should be removed and
>> the leads soldered direct to the FET,that's a TEK 'mandatory'
>> mod(meaning it shoulda been done when in for any service).The Molex
>> would discolor and burn up.
>>
>> R909 is a 1 ohm,ww,fusible 2W resistor,p/n 308-0677-00
>> I believe Q909 is a TIP31A,and you should replace both of the pair
>> when one
>> blows.(TEK p/n 151-0476-02
>>
>> You should also check the PS electrolytics for bad ESR.
>> The rectifier diodes also may short.
>>
>> Watch out for poor focus/astig,the focus string resistors increse in
>> value

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>> *and eventually open and should be replaced with carbon composition
>> types instead of the carbon film types in there now.*
>>
>> *The way this PS works is that the line V is rectified and
>> filtered, about 170VDC, and then a switching pre-regulator (TL494/594
>> based) drops it to ~43VDC, then the power oscillator converts that to
>> the secondary voltages and HV.*
>
>
>

Your scope should regulate from 90–250 VAC without any internal changes.

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Jim Yanik
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