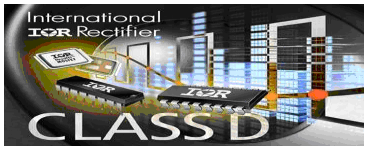
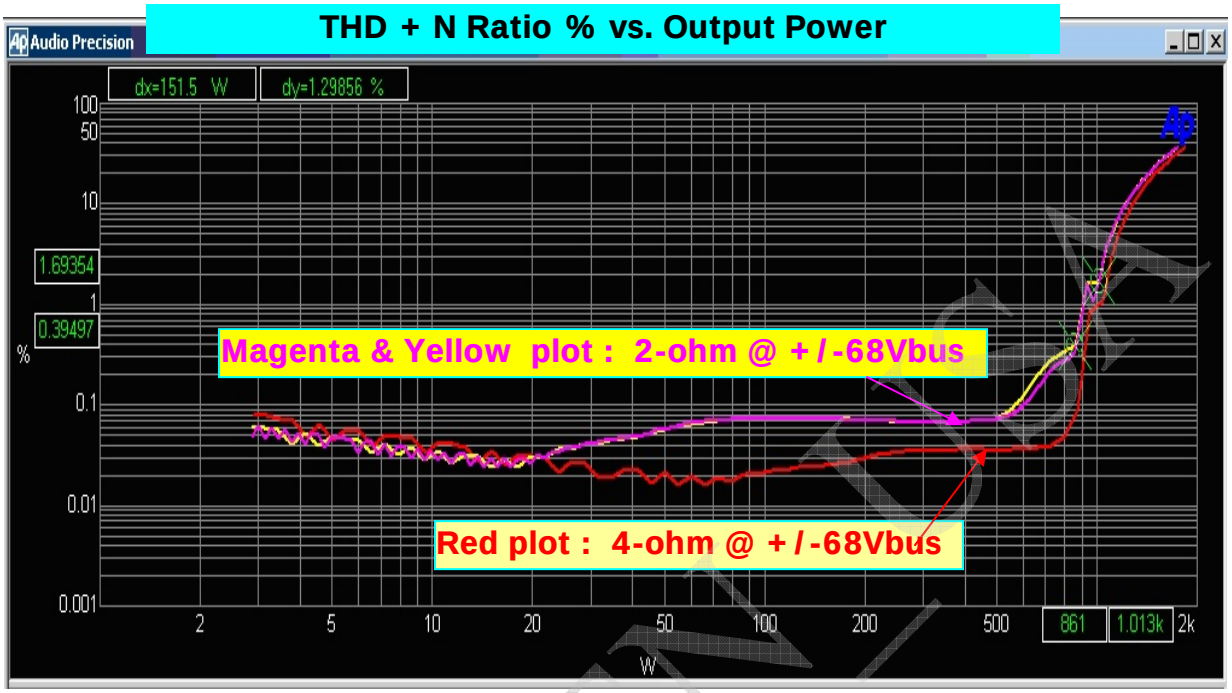
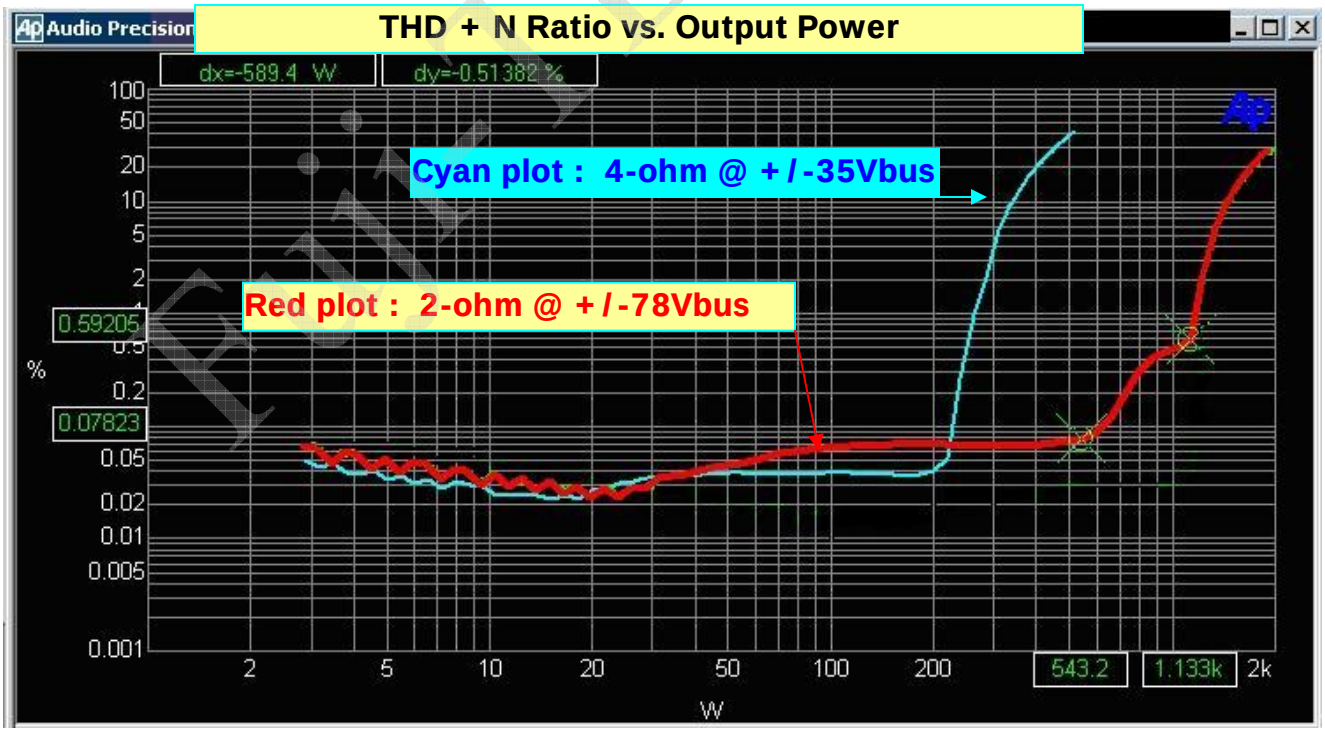
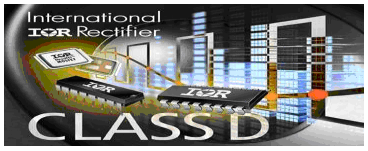


IRS2092 : 1-kW Buffered IRFB4227 (TO220)
Class D Amplifier using modified IRAUDAMP5

THD Performance Test

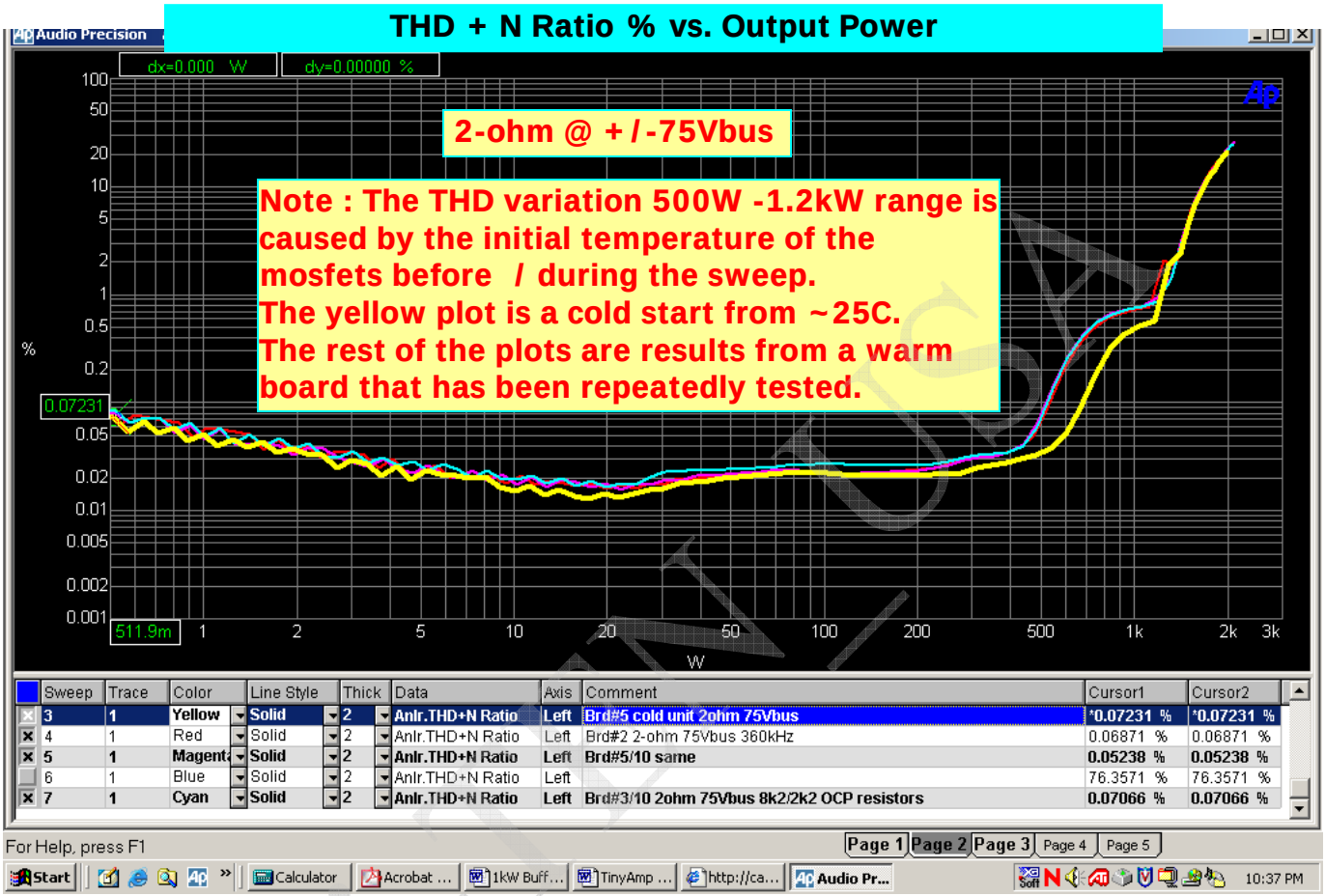






IRS2092 : 1-kW Buffered IRFB4227 (TO220) Class D Amplifier using modified IRAUDAMP5

THD + N Ratio % vs. Output Power



Sweep	Trace	Color	Line Style	Thick	Data	Axis	Comment	Cursor1	Cursor2
3	1	Yellow	Solid	2	Anlr.THD+N Ratio	Left	Brd#5 cold unit 2ohm 75Vbus	*0.07231 %	*0.07231 %
4	1	Red	Solid	2	Anlr.THD+N Ratio	Left	Brd#2 2-ohm 75Vbus 360kHz	0.06871 %	0.06871 %
5	1	Magent	Solid	2	Anlr.THD+N Ratio	Left	Brd#5/10 same	0.05238 %	0.05238 %
6	1	Blue	Solid	2	Anlr.THD+N Ratio	Left		76.3571 %	76.3571 %
7	1	Cyan	Solid	2	Anlr.THD+N Ratio	Left	Brd#3/10 2ohm 75Vbus 8k2/2k2 OCP resistors	0.07066 %	0.07066 %

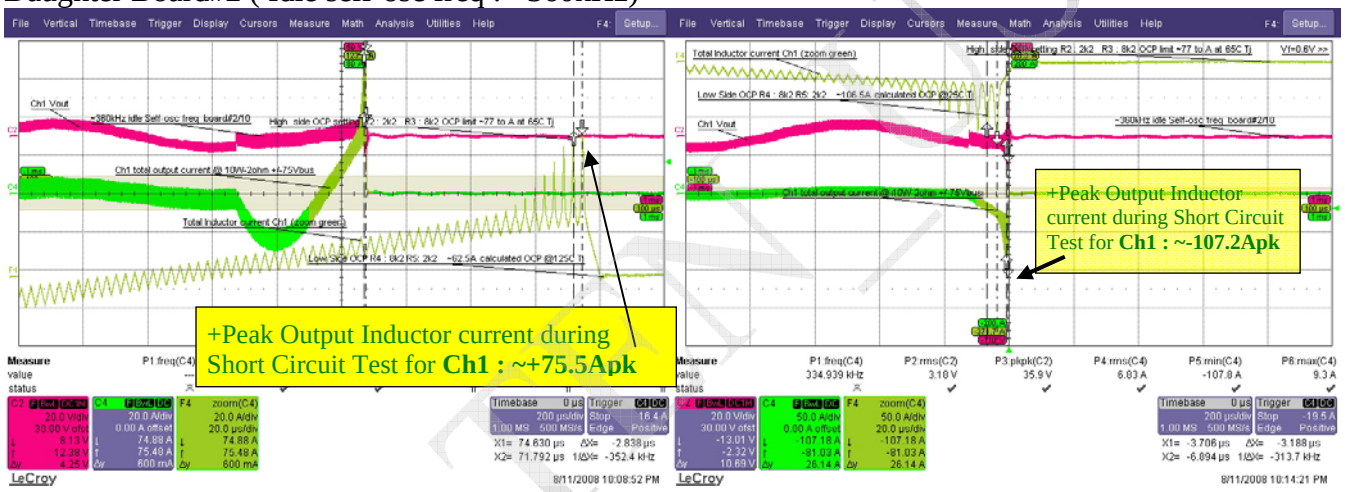
IRS2092 : 1-kW Buffered IRFB4227 (TO220) Class D Amplifier using modified IRAUDAMP5

Low side R4 / R5 : 8k2 / 2k2 High side R3 / R2 : 8k2 / 2k2

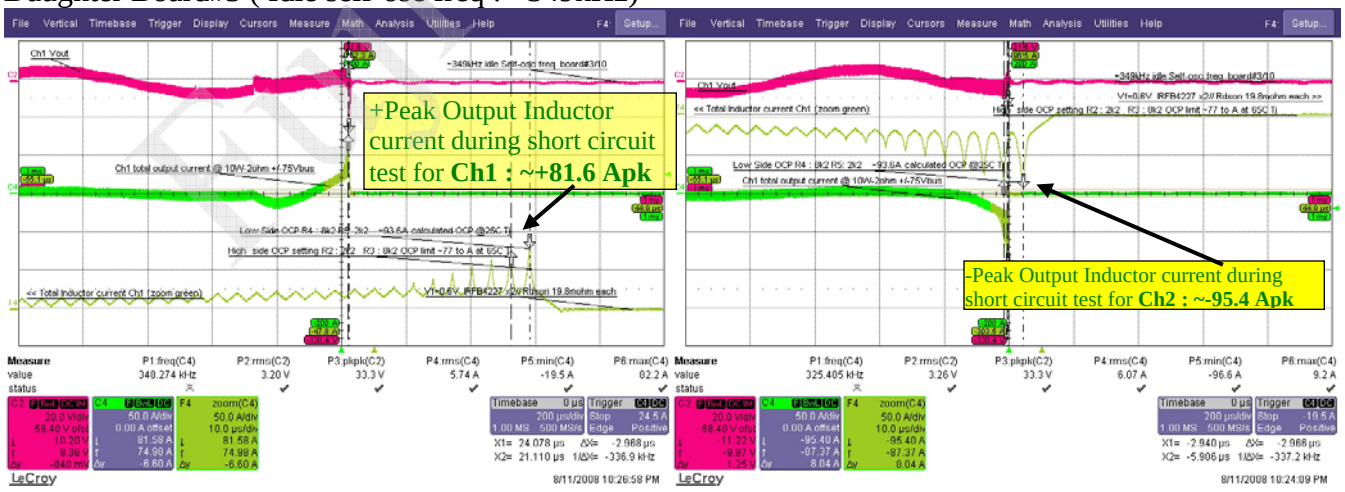
The peak of the short circuit current is highly dependent on the interrelationship of the Rdson vs. junction temperature of the mosfets. The variation of the OCP current is deemed to be reasonable considering duration the daughter board is already running which warms up the board under test. The instantaneous OCP trip level is decided by the Ids and Rdson as a function of Tj.

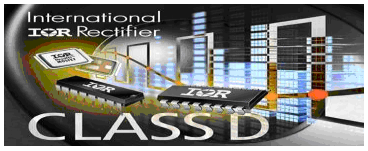
The ckt. designators R2/R3 and R4/R6 are referring to the OCP test portion of IRS20955 datasheet / appnote AN1138 for IRS2092.

Daughter Board#2 (Idle self-osc freq : ~360kHz)



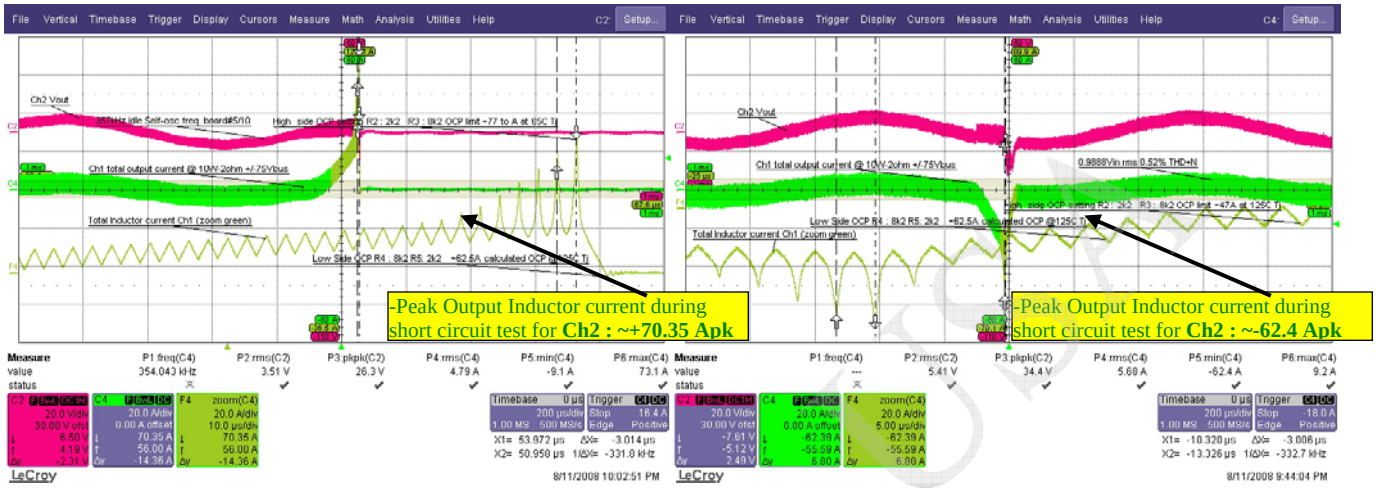
Daughter Board#3 (Idle self-osc freq : ~349kHz)





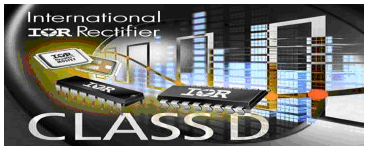
IRS2092 : 1-kW Buffered IRFB4227 (TO220) Class D Amplifier using modified IRAUDAMP5

Daughter Board#5 (Idle self-osc freq : ~357kHz)

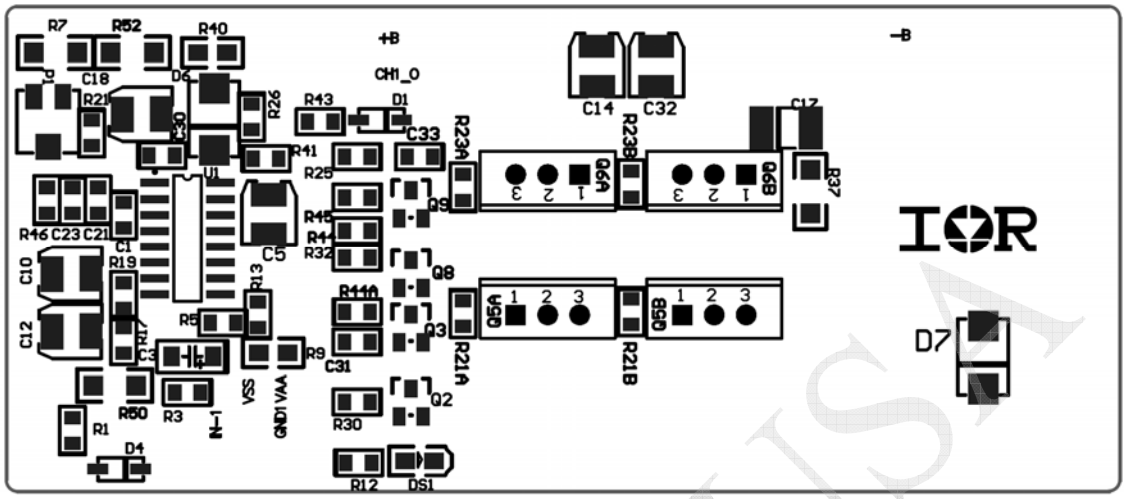


IRS2092 OCP Calculation *Input in blue italics,* **Fix parameters and calculated values in black**												
LOW SIDE OCP												
Vref for OCL, **V** (4.9 min, 5.1 typ, 5.4 max)	4.9	5.1	5.4	4.9	5.1	5.4	4.9	5.1	5.4	4.9	5.1	5.4
Rdson @ Tj :25C, **mohm** (Normalize factor : 1)	*9.85*	*9.85*	*9.85*	*9.85*	*9.85*	*9.85*	*9.85*	*9.85*	*9.85*	*9.85*	*9.85*	*9.85*
Target I_{trip} (High & Low -Side), **A**	*83*	*83*	*83*	*83*	*83*	*83*	*83*	*83*	*83*	*83*	*83*	*83*
Voc set, **V** (= I_{ds}*R_{dson})	0.81755	0.81755	0.81755	0.81755	0.81755	0.81755	0.81755	0.81755	0.81755	0.81755	0.81755	0.81755
R4 + R5 = **(kohm)**		*10.0*			*10.0*			*10.0*			*10.0*	
R4, **kohm**	8.33	8.40	8.49	8.33	8.40	8.49	8.33	8.40	8.49	8.33	8.40	8.49
R5, **kohm**	1.67	1.60	1.51	1.67	1.60	1.51	1.67	1.60	1.51	1.67	1.60	1.51
α Normalize Rdson factor @ Tj : 65-100 C : 1.25 - 1.50, Tj : 125 - 150 C, 1.68 -1.88		*1.00*			*1.25*			*1.50*			*1.68*	
Expected I_{trip} @ T_j	83.0	83.0	83.0	66.4	66.4	66.4	55.3	55.3	55.3	49.4	49.4	49.4
HIGH SIDE OCP												
Vth_{OCH}, **V**	1.1	1.2	1.3	1.1	1.2	1.3	1.1	1.2	1.3	1.1	1.2	1.3
V_f, **V** (High side $_{OCP}$ sense blocking diode)		*0.6*			*0.6*			*0.6*			*0.6*	
$V_{DSon\ (highside)}$, **V** (= I_{ds}*R_{dson})	0.81755	0.81755	0.81755	0.81755	0.81755	0.81755	0.81755	0.81755	0.81755	0.81755	0.81755	0.81755
R2, **kohm**	*2.20*	*2.20*	*2.20*	*2.20*	*2.20*	*2.20*	*2.20*	*2.20*	*2.20*	*2.20*	*2.20*	*2.20*
R3, **kohm**	7.62	12.14	24.33	7.62	12.14	24.33	7.62	12.14	24.33	7.62	12.14	24.33
Expected I_{trip} @ T_j	83.0	83.0	83.0	66.4	66.4	66.4	55.3	55.3	55.3	49.4	49.4	49.4

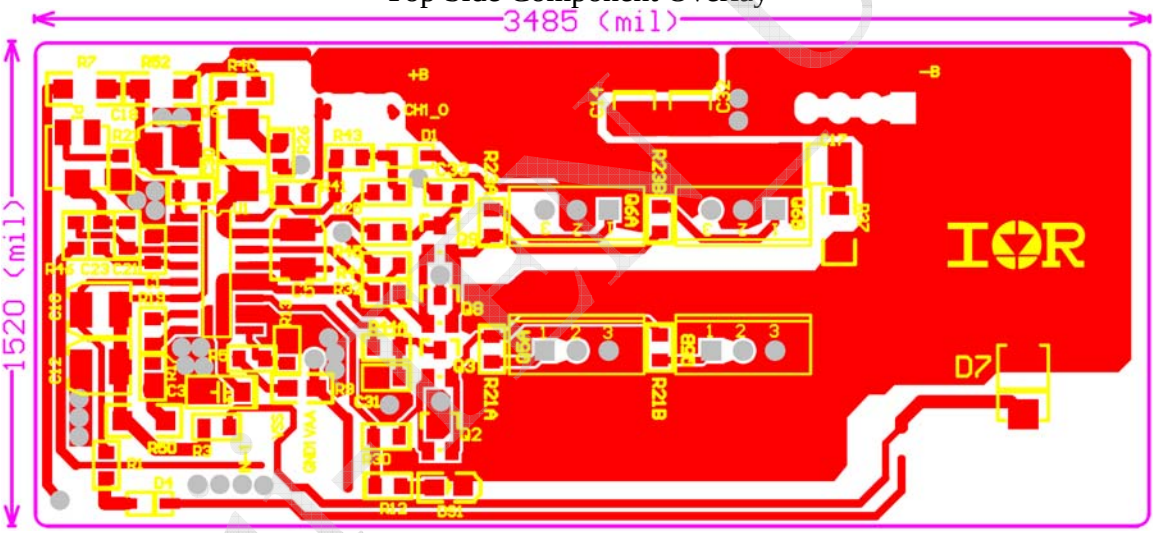
LOW SIDE OCP												
R4, **kohm**	*8.20*	*8.20*	*8.20*	*8.20*	*8.20*	*8.20*	*8.20*	*8.20*	*8.20*	*8.20*	*8.20*	*8.20*
R5, **kohm**	*2.20*	*2.20*	*2.20*	*2.20*	*2.20*	*2.20*	*2.20*	*2.20*	*2.20*	*2.20*	*2.20*	*2.20*
α Normalize Rdson factor @ Tj : 65-100 C : 1.25 - 1.50, Tj : 125 - 150 C, 1.68 -1.88		*1.00*			*1.25*			*1.50*			*1.68*	
Actual V_{OCSET}	1.04	1.08	1.14	1.04	1.08	1.14	1.04	1.08	1.14	1.04	1.08	1.14
Calculated Low-side Trip current based on actual ckt value @ T_j, **(A)**	105.2	109.5	116.0	84.2	87.6	92.8	70.2	73.0	77.3	62.6	65.2	69.0
HIGH SIDE OCP												
R2, **kohm**	*2.20*	*2.20*	*2.20*	*2.20*	*2.20*	*2.20*	*2.20*	*2.20*	*2.20*	*2.20*	*2.20*	*2.20*
R3, **kohm**	*8.20*	*8.20*	*8.20*	*8.20*	*8.20*	*8.20*	*8.20*	*8.20*	*8.20*	*8.20*	*8.20*	*8.20*
Calculated High-side Trip current based on actual ckt value @ T_j, **(A)**	80.7	93.6	106.5	64.6	74.9	85.2	53.8	62.4	71.0	48.0	55.7	63.4



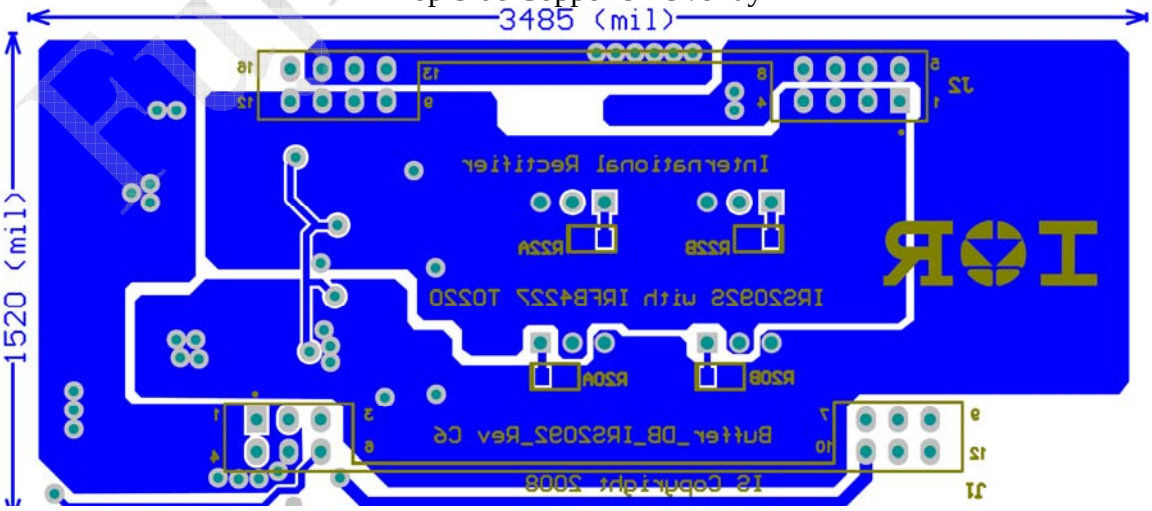
IRS2092 : 1-kW Buffered IRFB4227 (TO220) Class D Amplifier using modified IRAUDAMP5



Top Side Component Overlay

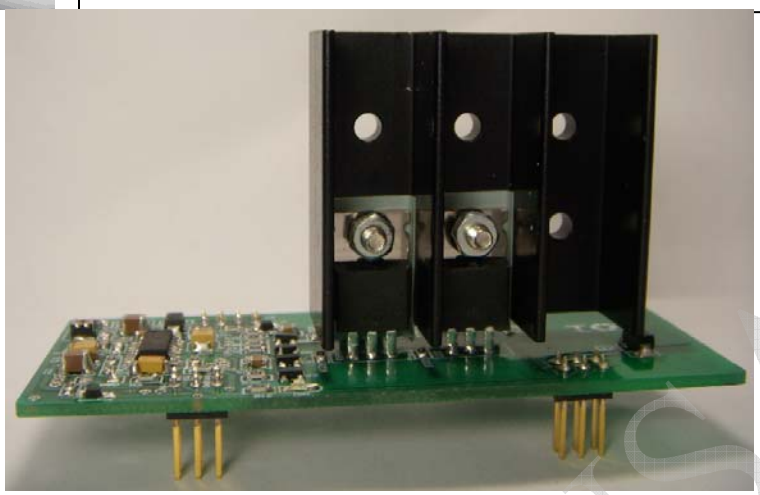


Top Side Copper & Overlay

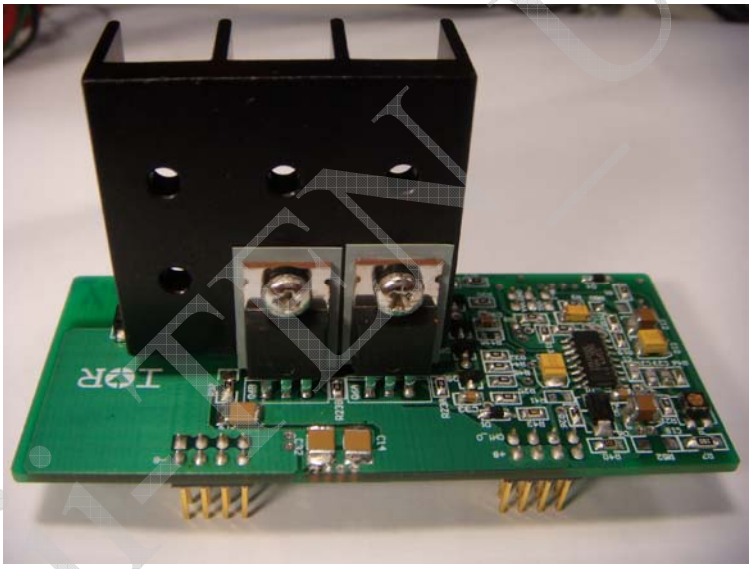


Bottom Side Copper & Component Overlay

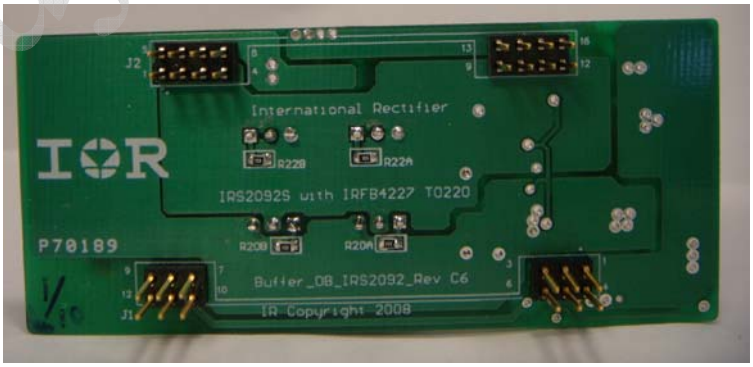
IRS2092 : 1-kW Buffered IRFB4227 (TO220) Class D Amplifier using modified IRAUDAMP5



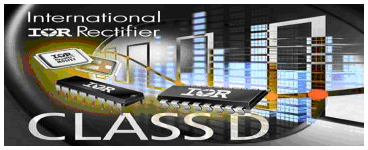
Front View



Top Side (back view)



Bottom side



IRS2092 : 1-kW Buffered IRFB4227 (TO220) Class D Amplifier using modified IRAUDAMP5

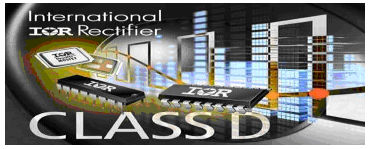
Bill of Materials

CLASS D STEREO AMP REFERENCE DESIGN IRS2092 Daughter Board

Source Data From: 1kW TO220 Buffred IRS2092 DB revC6c.PrjPcb
Project: 1kW TO220 Buffred IRS2092 DB revC6c.PrjPcb

Creation Date: 08/12/2008
Print Date:

Designator	LibRef Footprint	PartType	Quantity	Part No.	Vendor
C1	C-805	1nF,250V,COG	1	445-2325-1-ND	DIGI KEY
C3	C-1206	10uF, 16V, Tan	1	495-2236-1-ND	DIGI KEY
C5	Tan-B	10uF	1	399-3780-1-ND	DIGI KEY
C10	Tan-B	10uF, 16V/399-1593-1-ND/	1	399-3706-1-ND	DIGI KEY
C12, C18	Tan-B	3.3uF	2	445-1432-1-ND	DIGI KEY
C14, C32	1812	0.22 uF	2	478-3986-1-ND	DIGI KEY
C17	1812	0.1uF	1	478-3988-1-ND	DIGI KEY
C21, C23	C-805	1nF,250V	2	445-2325-1-ND	DIGI KEY
C30	C-805	100nF	1	399-3486-1-ND	DIGI KEY
C31, C33	C-805	100nF	2	399-3486-1-ND	DIGI KEY
D1	SOD-123	BAV19WS-7-F	1	BAV19WS-FDICT-ND	DIGI KEY
D4	SOD-123	1N4148WS-7-F	1	1N4148WS-FDICT-ND	DIGI KEY
D6	SMB	MURA120T3G	1	MURA120T3GOSCT-ND	DIGI KEY
D7	SMB	ES1D	1	ES1DFSCT-ND	DIGI KEY
DS1	LED	LED-805	1	160-1645-1-ND	DIGI KEY
J1	CON EISA-31	A26568-ND	1	A26568-ND	DIGI KEY
J2	CON_POWER	A26570-ND	1	A26568-ND	DIGI KEY
P1	POT4MM-2	1K	1	ST32ETB102TR-ND	DIGI KEY
Q2, Q8	SOT23-BCE	ZXTP25100BFH	2	ZXTN25100BFHCT-ND	DIGI KEY
Q3, Q9	SOT23-BCE	ZXTN25100BFH	2	ZXTN25100BFHCT-ND	DIGI KEY
Q5A, Q5B, Q6A, Q6B	TO-220AB	IRFB4227	4		IR
R1	R-805	100R	1	P100ACT-ND	DIGI KEY
R3, R21A, R21B, R23A, R23B, R30, R32, R44, R45	R-805	10R	9	P10ACT-ND	DIGI KEY
R5	R-805	open	1	P3.3KACT-ND	DIGI KEY
R7	1206	10R	1	P10ECT-ND	DIGI KEY
R9	0805	10R	1	P10ACT-ND	DIGI KEY
R12	R-805	4.7K	1	P4.7KACT-ND	DIGI KEY
R13, R19	R-805	8.2K	2	P8.2KACT-ND	DIGI KEY
R17,R41,	R-805	2.2k	1	RHM1.2KARCT-ND	DIGI KEY
R20A, R20B, R22A, R22B, R25	R-805	10K	5	P10KACT-ND	DIGI KEY
R21	R-805	1k	1	P1.0KACT-ND	DIGI KEY
R26	R-805	4.7R	1	P4.7ACT-ND	DIGI KEY
R37	1206	1R	1	P1.0ACT-ND	DIGI KEY
R40	0805	33k	1	RHM33KARCT-ND	DIGI KEY
R44A	R-805	open	2	P10KACT-ND	DIGI KEY
R43	R-805	8.2k	1	RHM0.0ARCT-ND	DIGI KEY
R46	R-805	3.01k	1	RHM3.01KCCT-ND	DIGI KEY
R50, R52	1206	open	2	open	DIGI KEY
U1	SO-G16	IRS2092S	1		IR
HTSNK assy 1		To220 Heatsink 15W	1	7-342-2PP-BA	DIGI KEY
Lock Washer			4		
Silpad insulator pad			4	K10-43	BERGQUIST
plastic TO220-bushing			4		
mounting screws / bolts			4 sets		
			76		



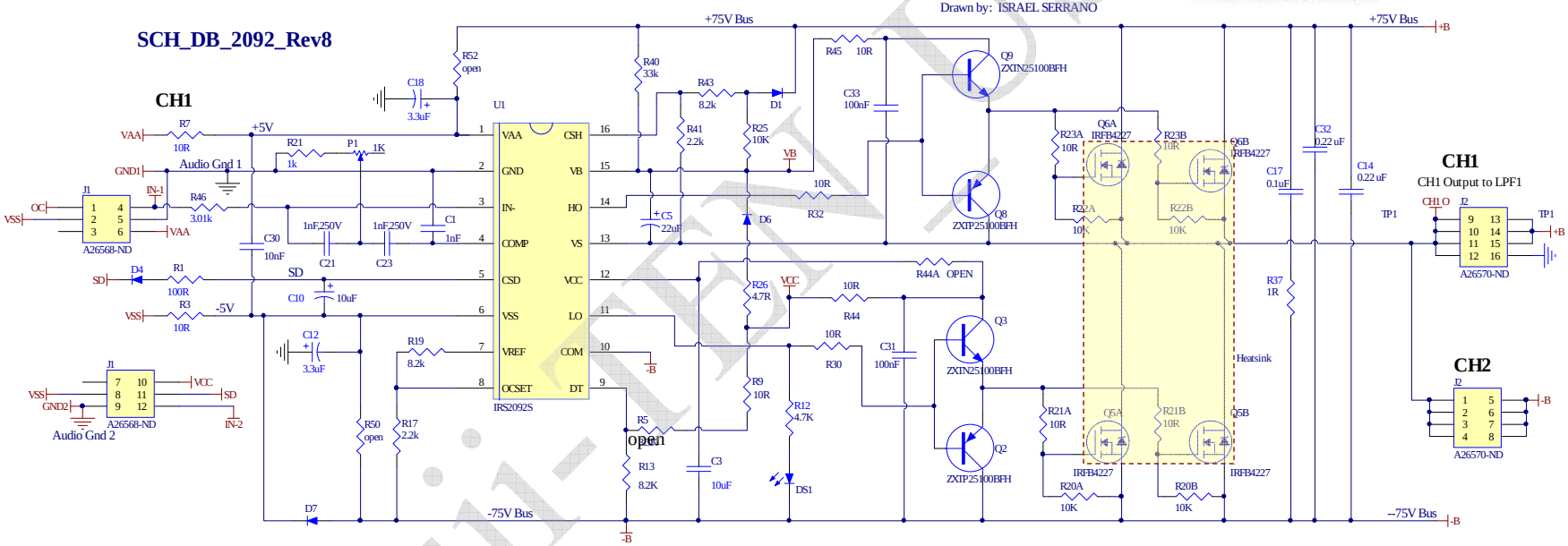
IRS2092 : 1-kW Buffered IRFB4227 (TO220) Class D Amplifier using modified IRAUDAMP5

Class D, 1kW Single Channel TO220 buffered Daughter Board IRS2092S Module Schematic

International IOR Rectifier

Drawn by: ISRAEL SERRANO

SCH_DB_2092_Rev8



Note :
1) OCP ckt setting is remarkably accurate based on repeated test.
2) +/-75V bus and heatsink are intended for 2-ohm load -1kW testing.
3) Output is taken from 2 output connectors which make use of both Ch1 & Ch2 output filters of a modified IRAUDAMP5 board.
4) All test results in this report are subject to change / confirmation test.