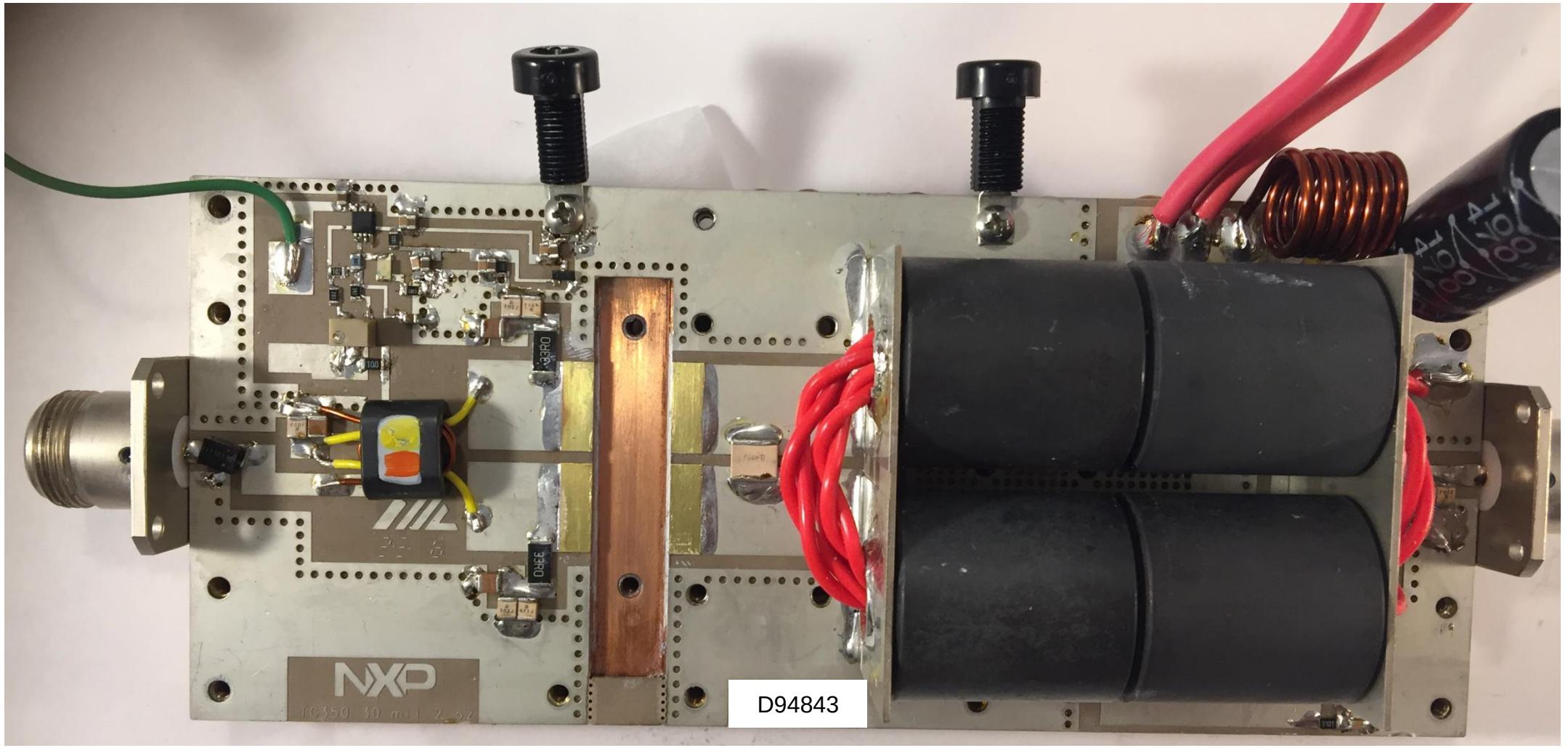
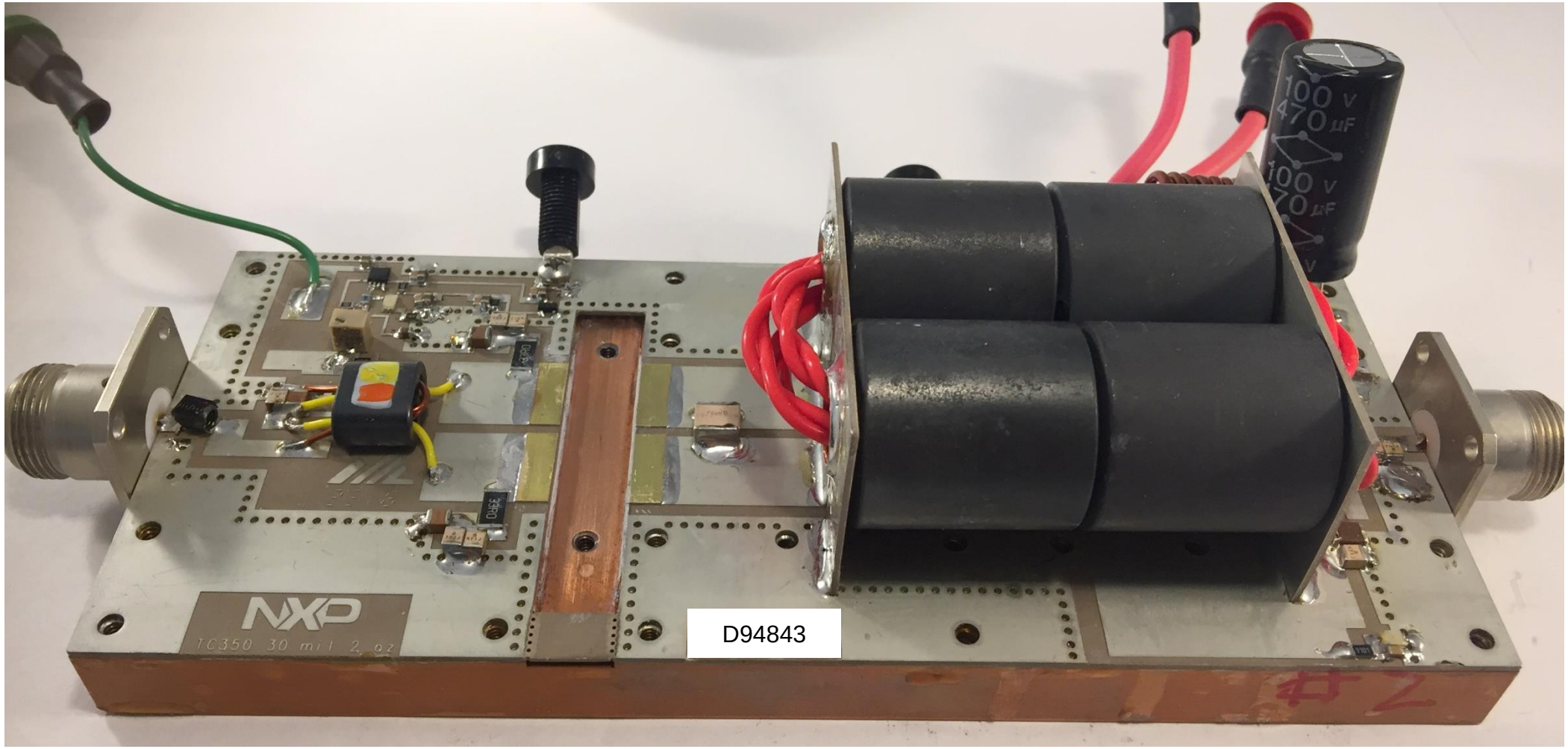
MRFX1K80H 27 MHZ REFERENCE CIRCUIT

SECURE CONNECTIONS
FOR A SMARTER WORLD

Fixture Photo Top



Fixture Photo

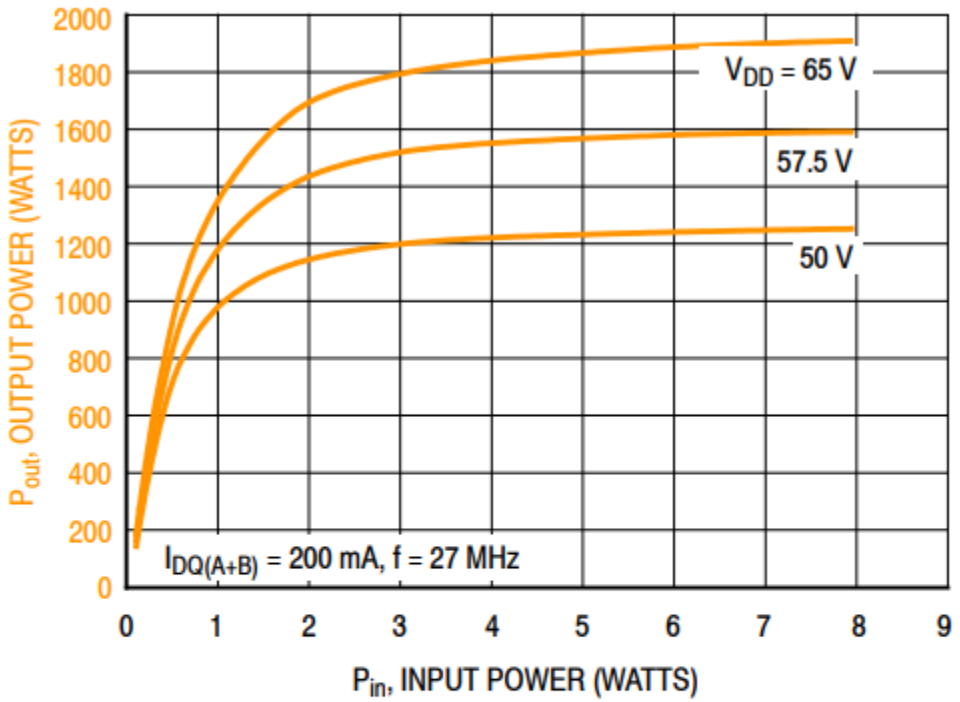


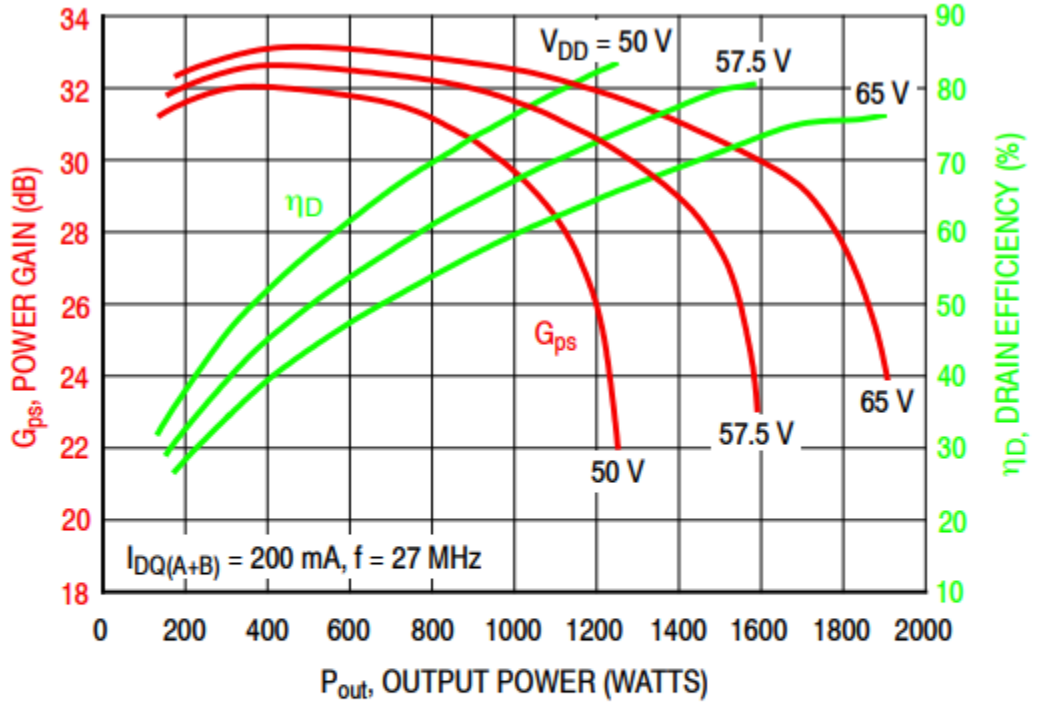
Typical performance

$I_{DQ(A+B)}$ = 200 mA, P_{in} = 3 W, CW

Frequency (MHz)	V_{DD} (V)	P_{out} (W)	G_{ps} (dB)	η_D (%)
27	50	1200	26.0	82.3
	57.5	1520	27.0	80.1
	65	1800	27.8	75.6

Typical performance

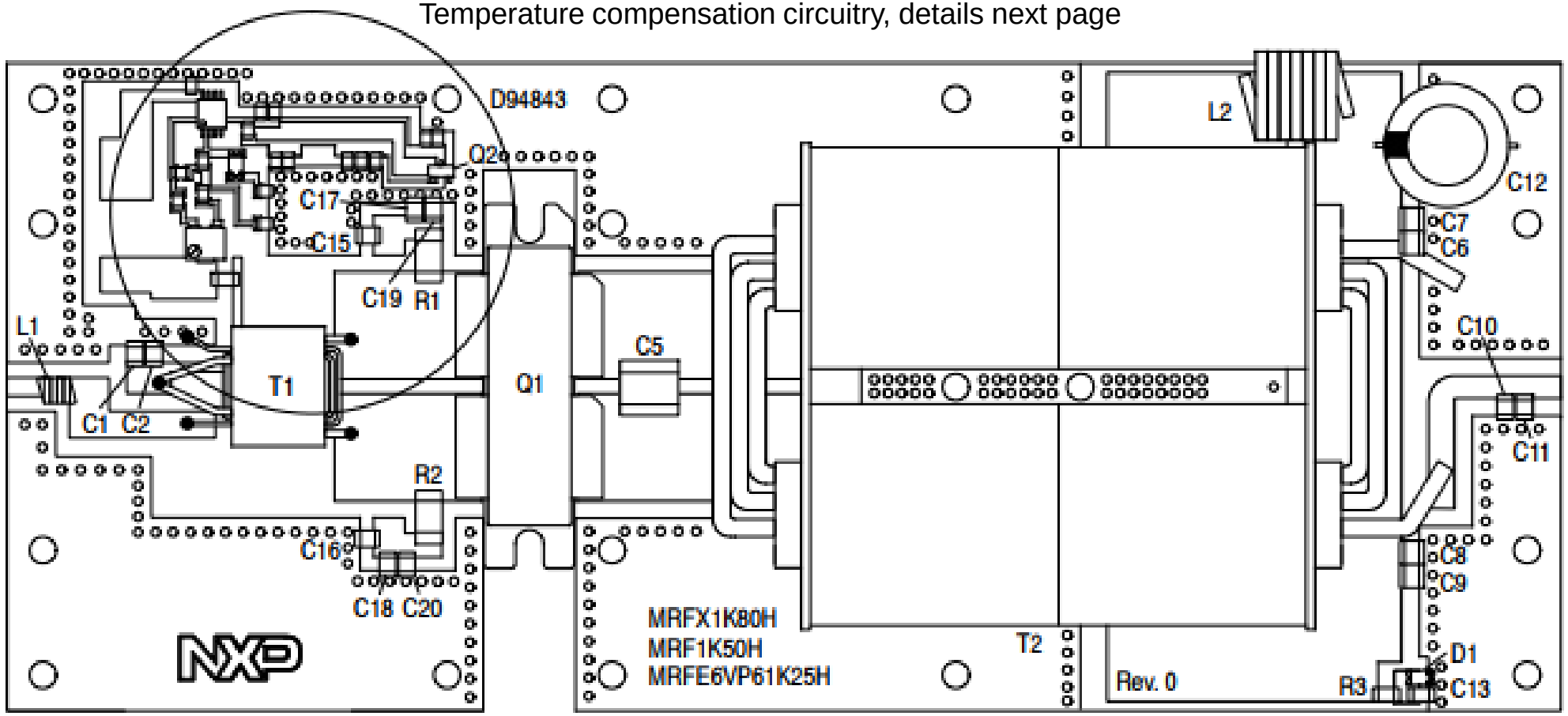




f (MHz)	V_{DD} (V)	P1dB (W)	P_{sat} (W)
27	50	825	1250
	57.5	1010	1600
	65	1150	1900

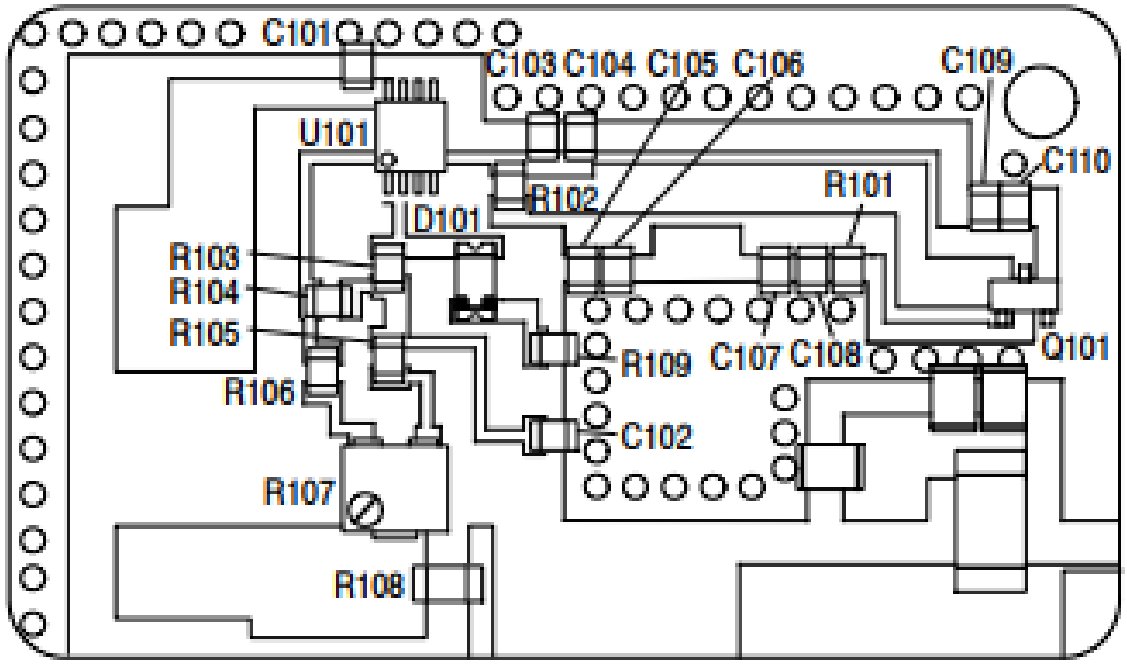
Component Placement

Temperature compensation circuitry, details next page

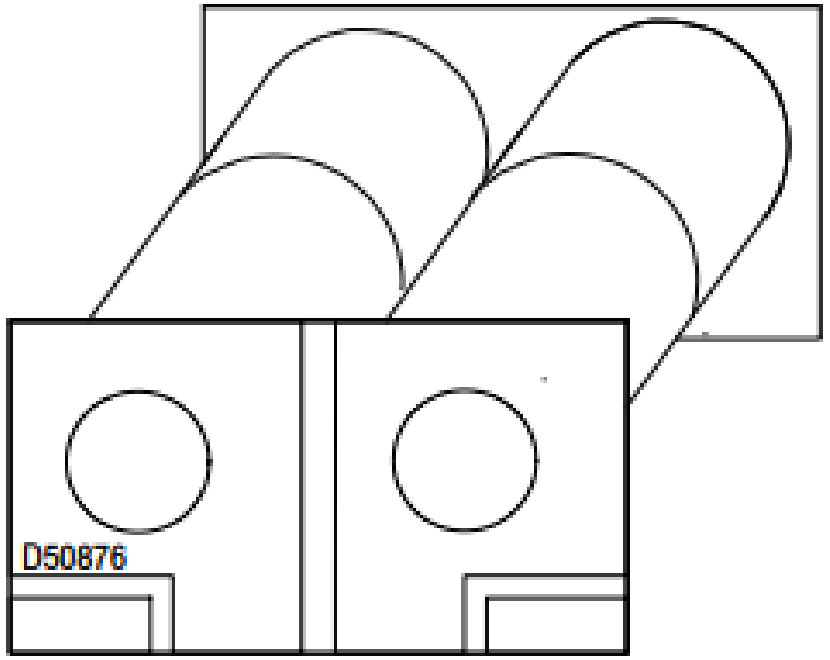


Note: Component numbers C3, C4 and C14 are not used.

Component Placement



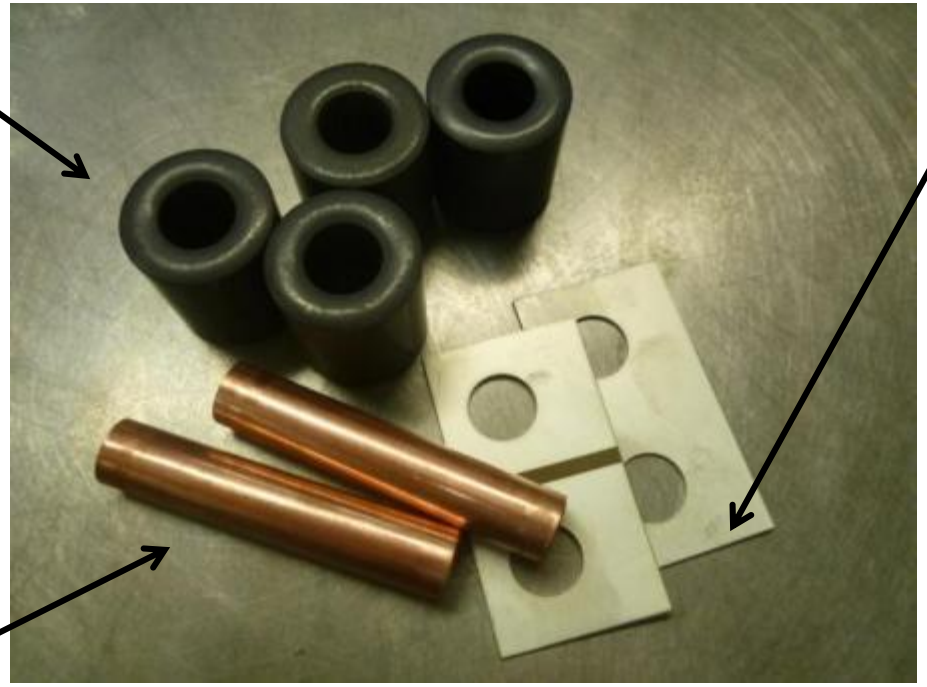
Temperature Compensation Detail



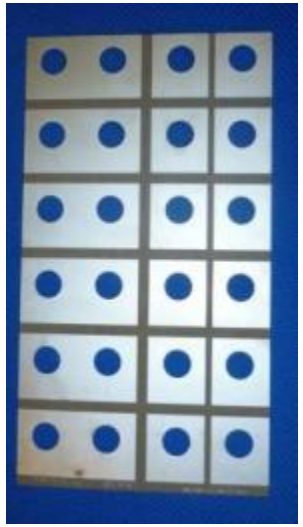
T2 Transformer Detail

Fixture Assembly

4x ferrite 61
(P/N 2661102002 Fair-rite)



Input and outpout
transformer PCB edge
Cutted into D50876
board



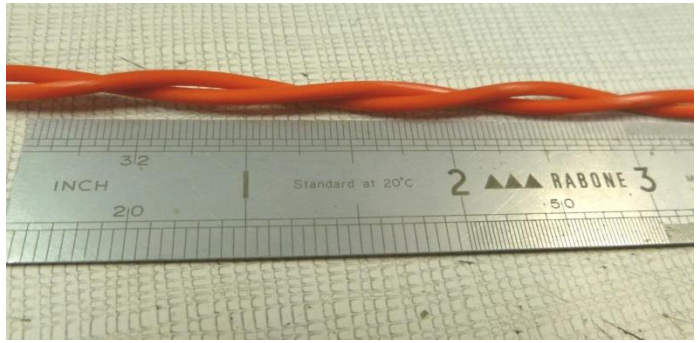
Copper Pipes X2 2.44 inch (62 mm)
External Diameter 0.500 inch (12.7 mm)
Internal Diameter 0.430 inch (10.9 mm)

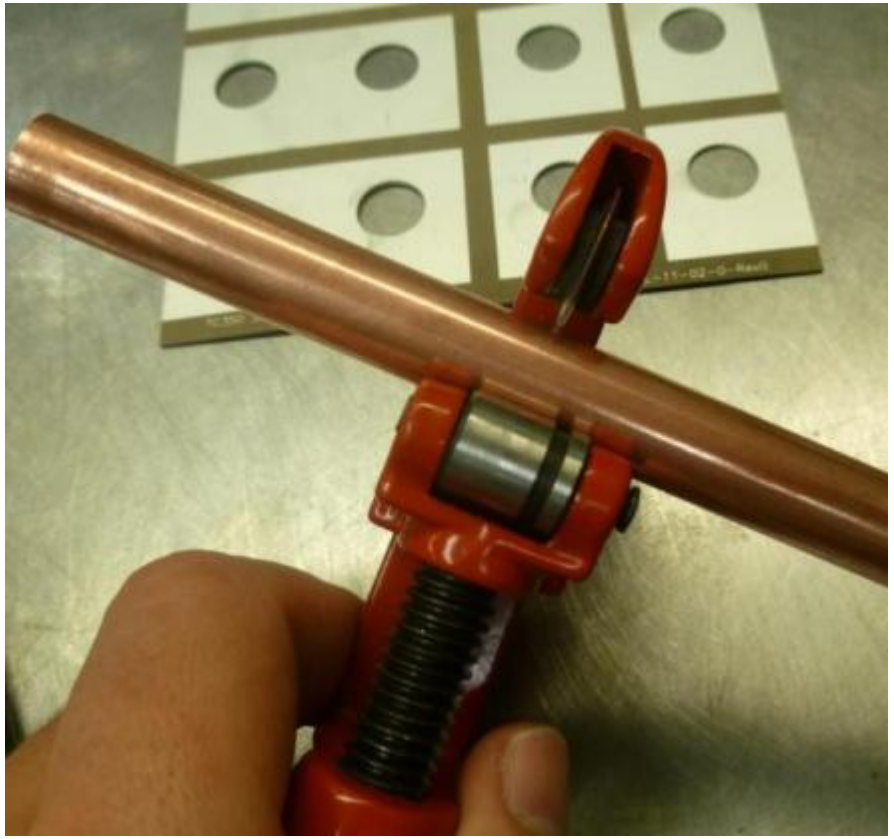
Fixture Assembly

Use Plumbing Tool to Cut
the Copper Tube LH03005 or LH03010

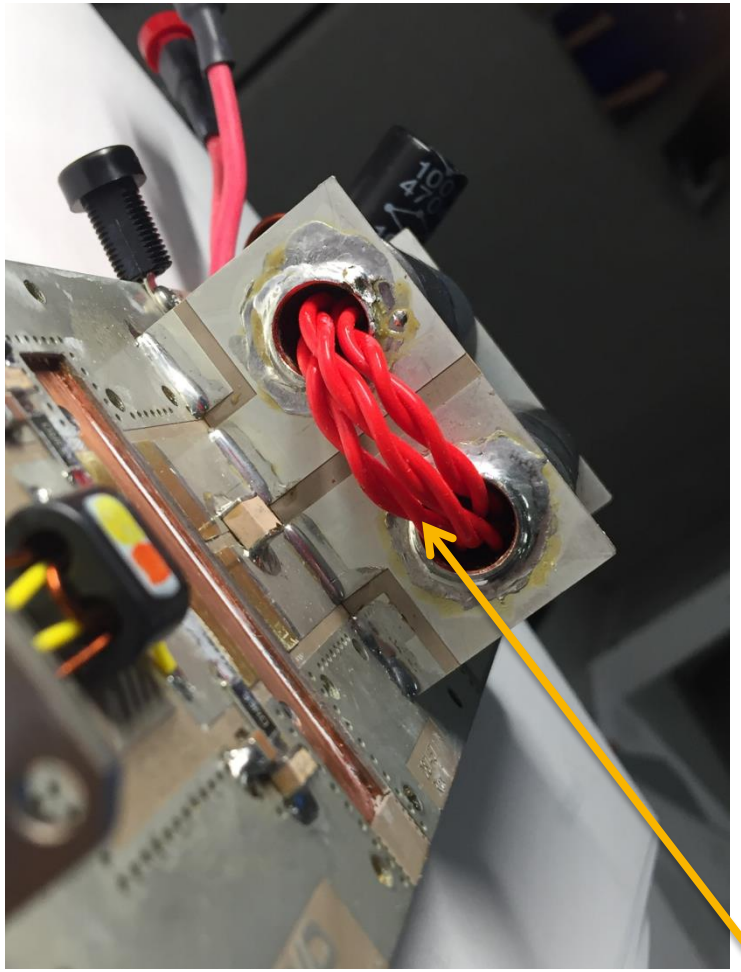
The tubes are 2.44 inch / 62mm long
Ext Diameter = 0.500 inch / 12.7 mm
Int Diameter = 0.430 inch / 10.9 mm

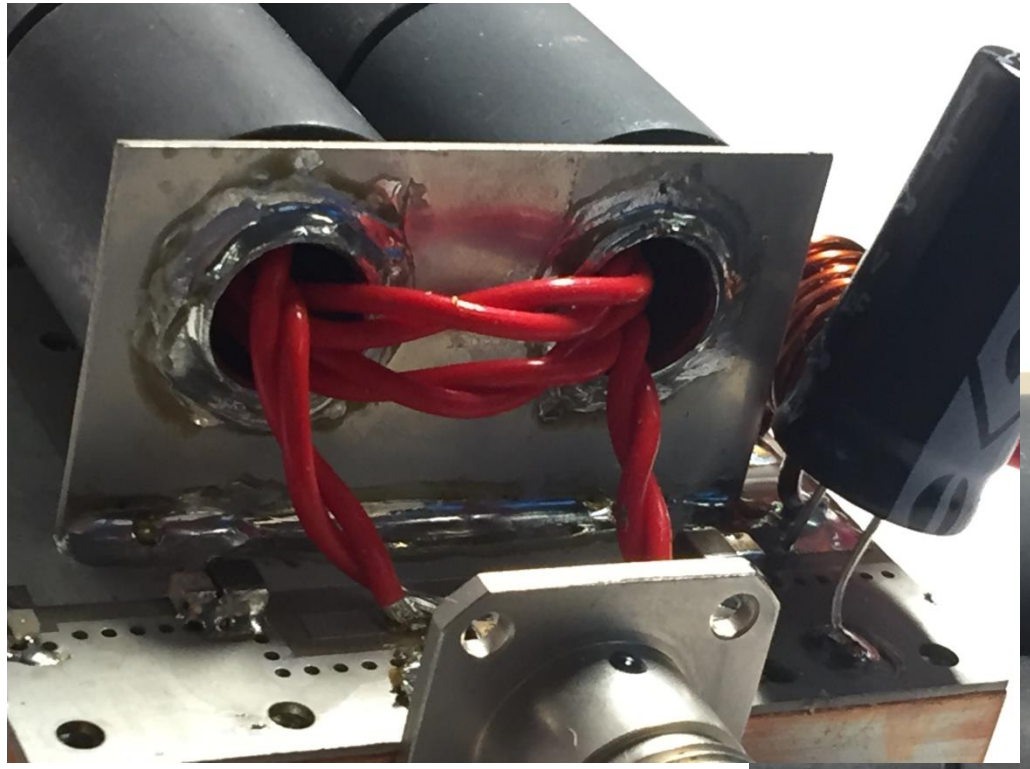
About 1 twists per 1.5 inch / 38 mm

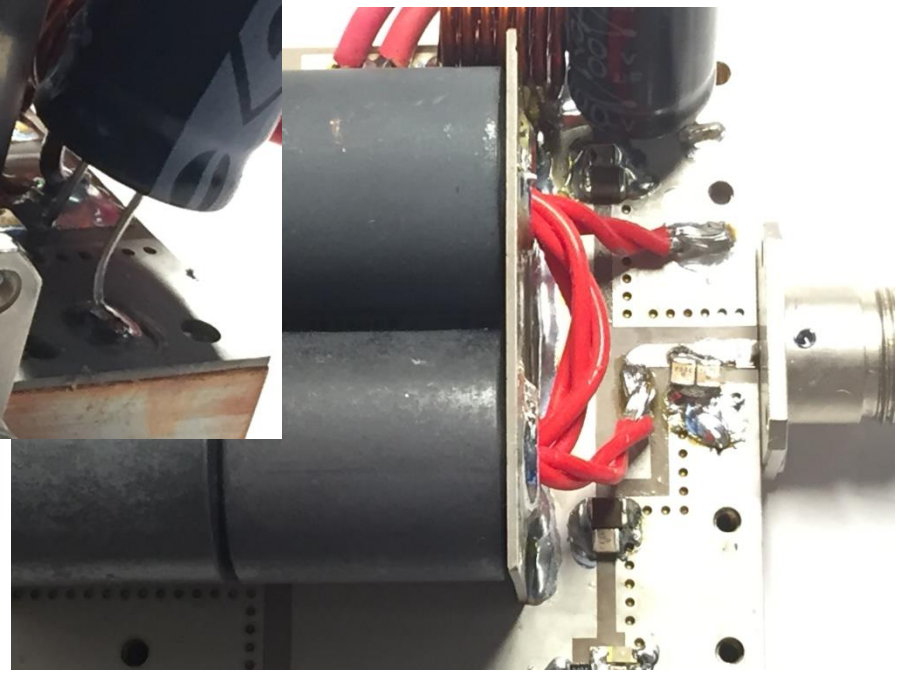




Balun manufacturing – Output 3 turns twisted wire

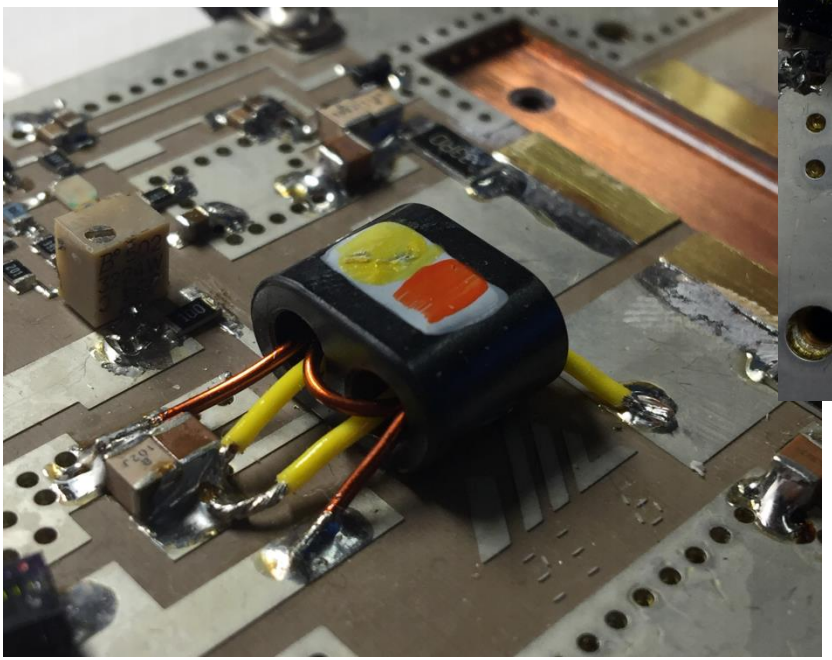


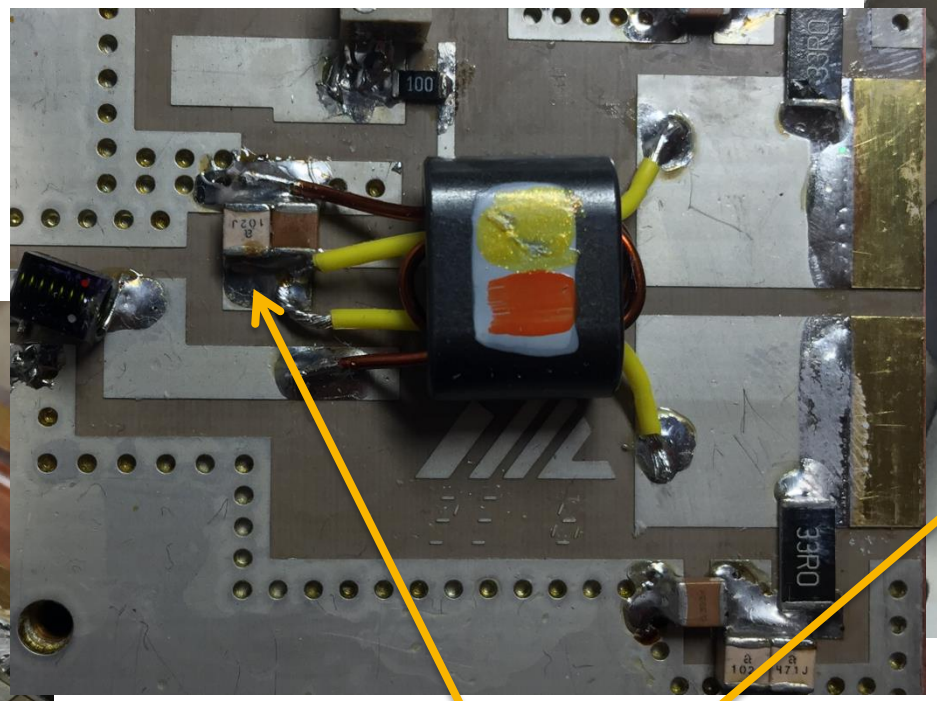


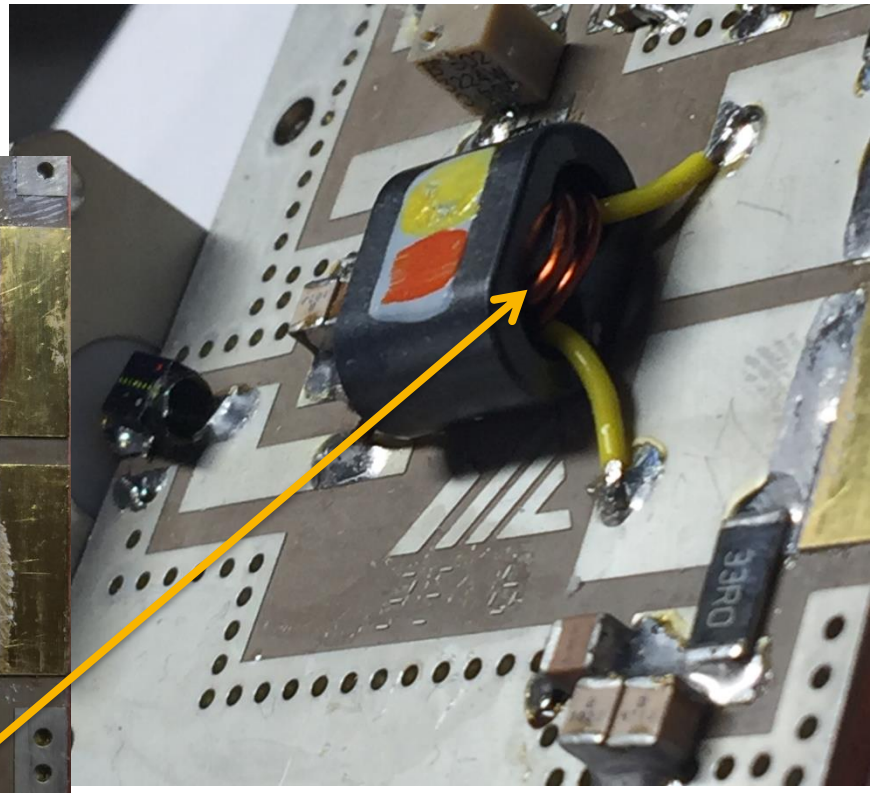


3 turns on Transformer with twisted wire, approx 4’

Fixture Assembly





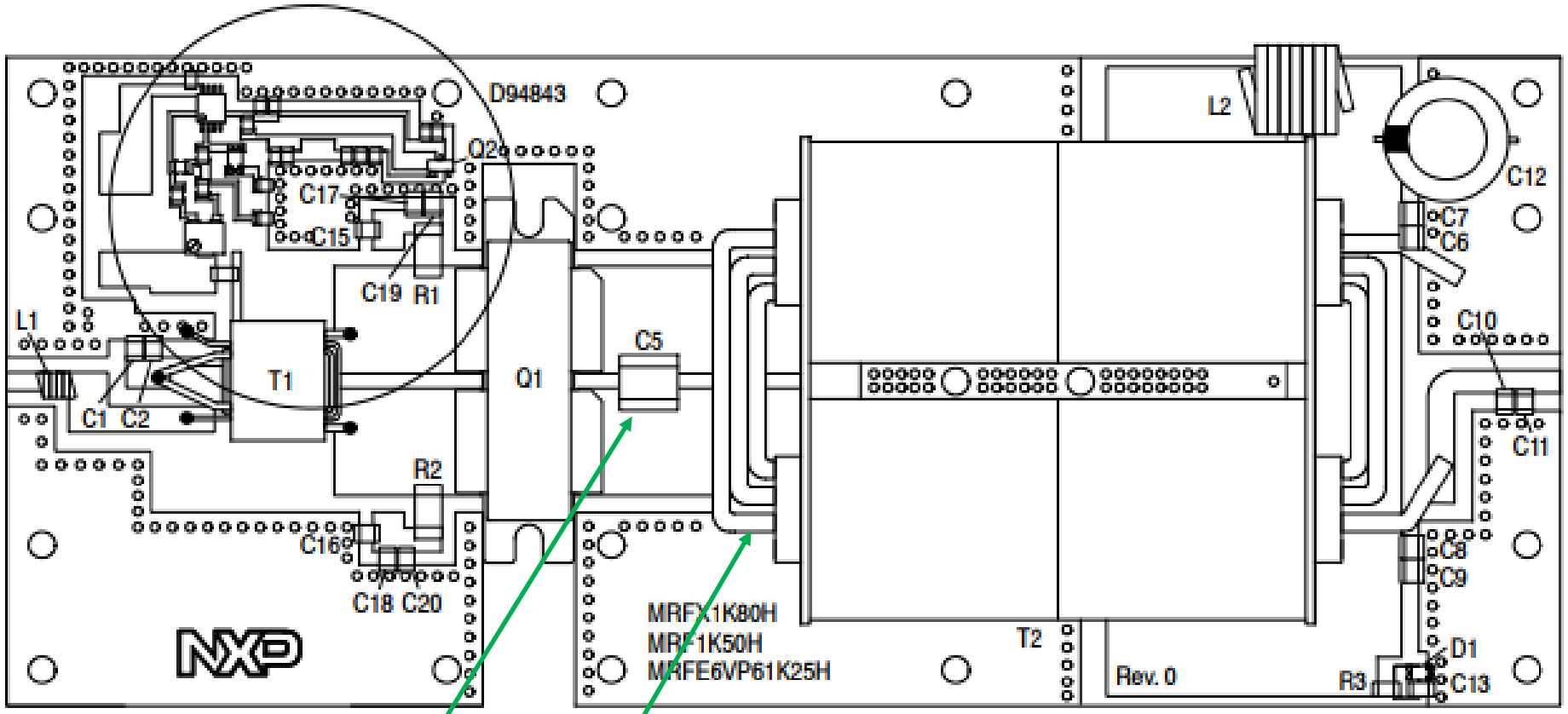


Two turns on primary (brown) and
One on secondary (yellow) with half point connected to decoupling capacitors.

Bill of Material

Part	Description	Part Number	Manufacturer
C1,C17,C18	1000 pF chip capacitors	100B102JT50XT	ATC
C2,C15,C16	39,000 pF chip capacitors	200B393KT50XT	ATC
C5,	470 pF CLX chip capacitors	152CLX471JCL	TEMEX Ceramics
C6, C8	2.2 uF 100V chip capacitors	HMK432B7225KM-T	Taiyo Yuden
C7, C9, C19, C20	470 pF chip capacitors	100B471JT200XT	ATC
C10, C11	22 pF chip capacitors	100B220JT500XT	ATC
C12	470 uF 100V clectrolytic capacitor	MCGPR100V477M16X32-RH	Multicomp
L1	82 nH inductor	1812SMS-82NJLC	CoilCraft
L2	7 Turn, Inside Diameter 0.394 inch (10mm) #16 AWG Inductor	Handwound	NXP
R1,R2	33Ω 2512 chip resistor	1-2176070-3	TE Connectivity
R101	2.2k ohms 0805 chip resistor 1/8W	CRCW08052K20JNEA	Vishay/Dale
R102, R109	1.2k ohms 0805 chip resistors 1/8W	CRCW08051K20FKEA	Vishay/Dale
R103	10 ohms 0805 chip resistor 1/8W	RK73H2ATTD10R0F	KOA Speer
R104	1k ohms 0805 chip resistor 1/8W	RR1220P-102-D	Susumu
R105	3.9k ohms 0805 chip resistor 1/8W	CRCW08053K90JNEA	Vishay/Dale
R106	200 ohms 0805 chip resistor 1/8W	CRCW0805200RJNEA	Vishay/Dale
R107	SMT Trim Pot 5K, (11 turn)	3224W-1-502E	Bourns
R108	10 ohms 1206 chip resistor 1/8W	CRCW120610R0JNEA	Dale/Vishay
R110	9.1k ohms 1206 chip resistor 1/4W	CRCW12069K10FKEA	Dale/Vishay
U101	5V Voltage Regulator Micro8	LP2951ACDMR2G	On-Semi
Q1	RF Power LDMOS Transistor	MRFX1K80H	NXP
Q2	Bipolar NPN transistor SOT23	BC847ALT1G	On-Semi
C101,C102,C104,C106, C108,C110	1 uF 0805 chip capacitors	GRM21BR71H105KA12L	Murata
C103,C105,C107, C109, C111	1000 pF chip capacitors	C2012X7R2E102M	TDK
D1	Red Led 1206	LH N974	OSRAM
D2	Green Led 1206	LG N971	OSRAM
PCB	Arlon TC350 0.030" er=3.5	D94843	MTL
T1 Core	Multi Aperture Cores, 43 material	2843000302	Fair-Rite
T1 primary	#20 magnetic wire, Primary 2 Turns	8076	Belden
T1 secondery	#24 teflon wire, Secondary 1 turn	5854/7 BL005	Alpha Wire
T2 Core	Ferrite Cylindrical Core 61 material (X4)	2661102002	Fair-Rite
T2 PCB	Arlon TC350 0.030" er=3.5, X2	D50876	MTL
T2 primary	Copper pipes, type L, ID 3/8”, OD 1/2", cut to 2.4"	LH03010	Mueller
T2 secondary	16 AWG PTFE covered wire, 3 Turns, twisted	TEF16	RF Parts Company

Tuning tips



Tuning:
C5 will adjust efficiency and Pout
T2 will also effect efficiency and Pout by adjusting windings 1 twist per 1.5”

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