45 W 19 V adapter reference board with IPN70R600P7

Schematic

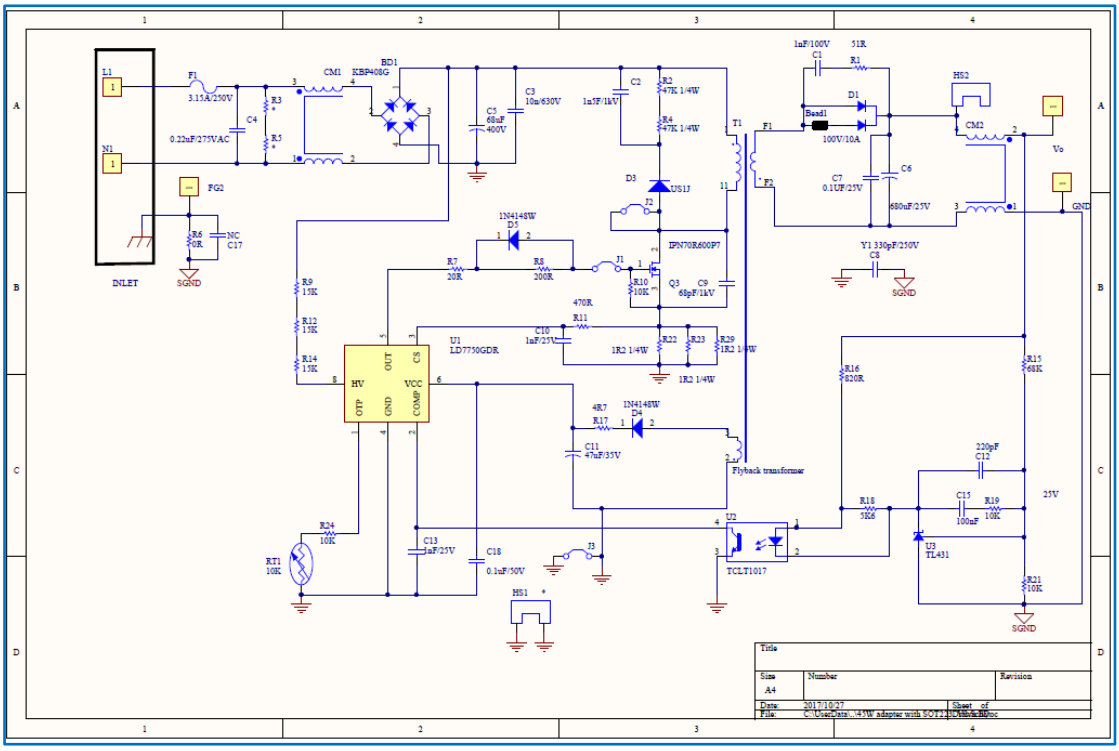


Fig.41 Schematic of reference board

PCB layout

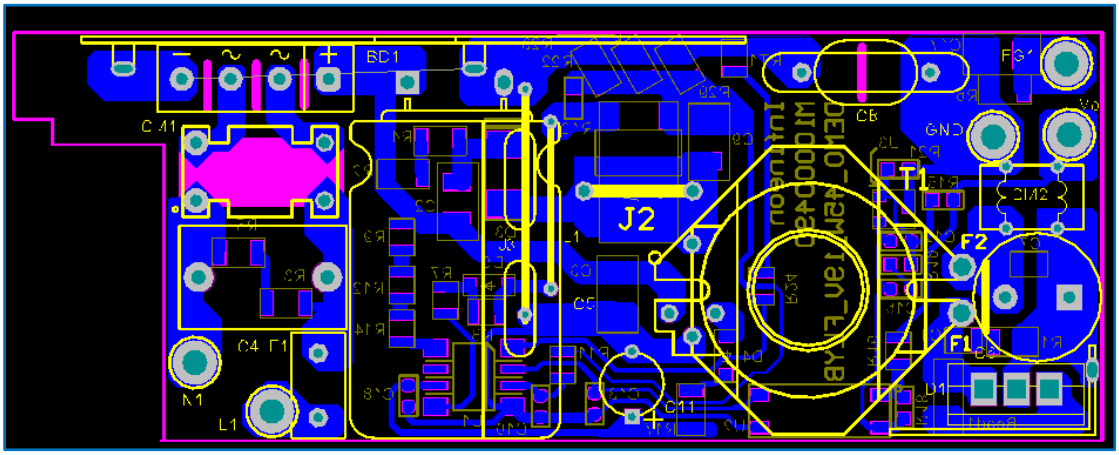


Fig.42 PCB layout reference board

Component List

Designator	Comment	Description	Part No/Order No	Manufacture
BD1	KBP208G	2.0A GLASS PASSIVATED BRIDGE RECTIFIER	KBP208G	Diodes
Bead1	SMD 50OHM Ferrite Bead	SMD 50OHM Ferrite Bead	2518065007Y6	Fair-Rite Product Corp
C1	1nF/100V	Ceramic Capacitor, X7R,CAP0805	C2012X7R2A102K085AA	TDK
C2	1nF/630V	1nF Multilayer Ceramic Capacitor MLCC 630V dc ±5% C0G Dielectric 1206 SMD, Max. Temp. 125°C	CGA5F4C0G2J102J085AA	TDK
C3	10nF/630V	10nF Multilayer Ceramic Capacitor MLCC 630V dc ± 5% C0G Dielectric 1206 SMD, Max. Temp. 125°C	CGA5L4C0G2J103J160AA	TDK
C17	No connected	No connected		
C4	0.22uF/275VAC	X2 Safety Capacitor	890334023028	Wurth Elektronik
C5	68uF/400V	Aluminum Electrolytic Capacitor	EKXJ401ELL680ML25S	NipponChemi-Con
C6	680uF/25V	Aluminum Electrolytic Capacitor	EEUFM1E681B	Panasonic
C7	1uF/25V	general purpose Ceramic Capacitor,CAP0805	C0805C105K3PACTU	KEMET
C8	Y1 680pF	AC Line Rated Ceramic Disc Capacitors	VY1681M31Y5UQ63V0	Vishay
C9	68pF/1kV	68pF Multilayer Ceramic Capacitor MLCC 1kV dc ±5% C0G Dielectric 1206 SMD, Max. Temp. +125°C	1206AA680JAT2A	AVX
C10, C12, C13, C15	1nF/25V	Ceramic Capacitor, NPO,CAP0603	GRM1885C1E102JA01D	Murata
C11	47uF/35V	Aluminum Electrolytic Capacitor	EKZH350ELL470ME11D	NipponChemi-Con
C14	No connected	No connected		
C18	0.1uF/50V	General purpose Ceramic Capacitor, X7R,CAP0603	C1608X7R1H104K080AA	TDK
CM1	20mH common choke	EMI common mode choke		Customized component
CM2	Short circuit			
D1	NTSV30H10G	100V/30A, Very Low Forward Voltage Trench-based Schottky Rectifier	NTSV30H10G	ON-SEMI
D3	US1J	Surface Mounted Ultrafast Diode	US1J	US1J-E3/61T
D4, D5	1N4148WS	Ultra-Fast Diode	1n4148WS	Diodes
F1	3.15A/250V	Fuse	6973150	Bel Fuse Inc.
J1	JUMPER	0.4Φ		
J2	JUMPER	1.2Φ		
J3	JUMPER	0.6Φ		
Q3	IPN70R600P7	NMOS, 700V	IPN70R600P7	Infineon

R1	51R	Chip Resistor, 5%,RES0805	CRCW0805051R0JKEA	Vishay
R2, R4	47K 1/4W	Chip Resistor 5%, RES1206	CRCW120647K0JKEA	Vishay
R3, R5	No connected	No connected		
R6	0R	Chip Resistor 5%, RES0805	CRCW08050000Z0EA	Vishay
R7	20R	Chip Resistor 5%, RES0805	CRCW0805020R0JKEA	Vishay
R8	620R	Chip Resistor 5%, RES0805	CRCW0805620R0JKEA	Vishay
R9, R12, R14	15K	Chip Resistor 5%, RES0805	CRCW080515K0JKEA	Vishay
R10, R19, R21	10K	Chip Resistor 1%, RES0603	CRCW060310K0FKEA	Vishay
R11	470R	Chip Resistor 5%, RES0805	CRCW0805470R0JKEA	Vishay
R15	68K	Chip Resistor 1%, RES0603	CRCW060368K0JKEA	Vishay
R16	820R	Chip Resistor 5%, RES0805	CRCW0805820R0JKEA	Vishay
R17	4R7	Chip Resistor 5%, RES0805	CRCW08054R70JKEA	Vishay
R18	5K6	Chip Resistor 5%, RES0603	CRCW060305K6JKEA	Vishay
R24	10K	Chip Resistor 1%, RES0805	CRCW080510K0FKEA	Vishay
R22, R23, R29	1R2 1/4W	Chip Resistor 1%, RES1206	CRCW12061R20FNEA	Vishay
RT1	10K	Chip Resistor, NTC Thermistors, RES0805	NCP21XV103J03RA	Murata
R30	No connected	No connected		
T1	Flyback transformer			Customized component
U1	LD7750RGR, SOP-8	Flyback Controller	LD7750R GR	Leadtrend
U2	TCLT1000	Photocoupler	TCLT1000	Vishay
U3	TL431(SOT-23-3)	TL431 Precision Programmable Reference	TL431ACDBZR	TI

Table3 Components List

Transformer Construction

No	Start	END	Wire	Turns	Wire Mode	Tape	Remark
N1	11	12	0.25Φx1	32	1 layer	2 layer	
N2	1	-	0.2Φx3	10	1 layer	2 layer	
N3	Fly1	Fly2	0.5x1	10	1 layer	2 layer	*
N4	3	2	0.2Φx3	10	1 layer	2 layer	
N5	Fly1	Fly2	0.5Φx1	10	1 layer	2 layer	*
N6	1	-	0.2Φx3	10	1 layer	2 layer	
N7	12	1	0.25Φx1	30	1 layer	2 layer	
N8	2		0	--			Copper strip

Inductance: 1-11 : inductance=700uH±3%;leakage inductance <25uH

*: Triple insulation wire

Table 4 Transformer construction

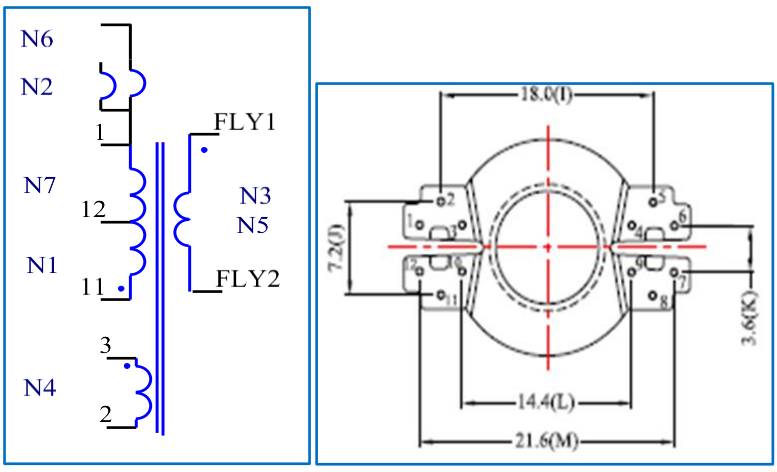


Fig. 43 Pin assignment of the transformer & bobbin of RM8

Common choke construction

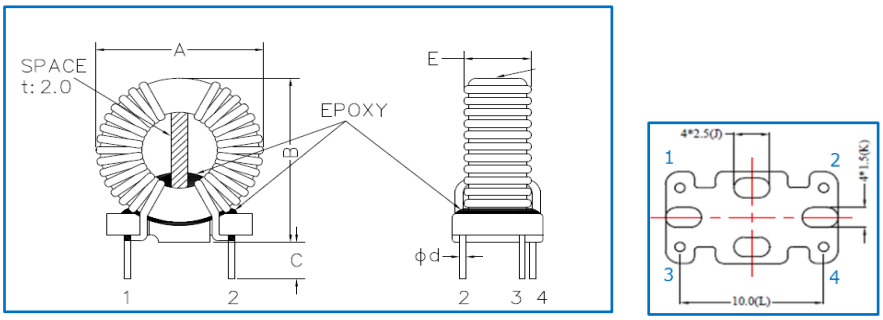


Fig.44 Construction & base of common choke

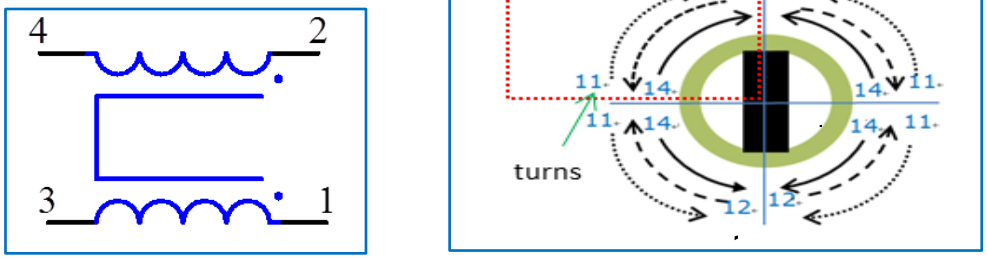


Fig.45 Winding rule for common choke

Core specifications

Material: Mn-Zn

Outline: 14mm(OD)x9mm(ID)x5mm(H)

AL: 4420±30%nH/N^2

Wiring rule

Complete 74 turns of each winding with 0.32ΦX1 wire, separated in two sectors. Start winding 14 turns from 9 to 12 o'clock, 12 turns from 12 to 9 o'clock, and, lastly, 11 turns from 9 to 12 o'clock in Sector 1. Follow this same rule for other sectors.

Inductance of each winding

21.7mH±30% @10kHz/0.1V

12mH±30% @200kHz/0.1V