

Transformers for switching power supplies
Pin terminal type



ECO2425SEO-D06V014

FEATURES

- Downsized yet compliant with worldwide safety standards.
- Supports automatic winding.
- Considerably reduced characteristic variations.

APPLICATION

- Isolation type Single-output power supplies
- Input : 90 to 264Vac
- 1Output : 36V/0.6A
- Circuit type : PWM flyback
- frequency : 100kHz

REFERENCE TEST BOARD

- TEST BOARD ECO30W-36 (TDK)

ECO2425SEO-D06V014

WINDING SPECIFICATIONS

No.	Coil	Terminal	Turns	Wire	Rdc(m Ω)* ¹	Note* ²
1	NP1	2 - 5	39	UEW 0.37	260	Clock wise (NP1 + NP2 =57Ts)
2	NS1	8 - 11	30	UEW 0.40	193	
3	NP2	5 - 6	18	UEW 0.37	156	Clock wise
4	NB	3 - 4	13	UEW 0.23	310	Clock wise
5						
6						
7						
8						
9						
10						

*1 Rdc value is a reference.

*2 Clockwise direction is an order direction when see a transformer from the upper part.

ECO2425SEO-D06V014

ELECTRICAL CHARACTERISTICS

Inductance* ¹ NP (μ H)	Tolerance	Leakage inductance* ¹ NP(NB,NS all shorted) (μ H)max.	Withstanding voltage* ²		Insulation resistance	
			Pri. - Sec.	Coil - Core	Pri. - Sec.	Coil - Core
640	$\pm 10\%$	8.5	AC3.0kVrms 1min or AC 3.6kVrms 1s	AC1.5kVrms 1min or AC 1.8kVrms 1s	DC500V 100M Ω min.	DC500V 100M Ω min.

*1 Measurement Condition : 100kHz, 1V

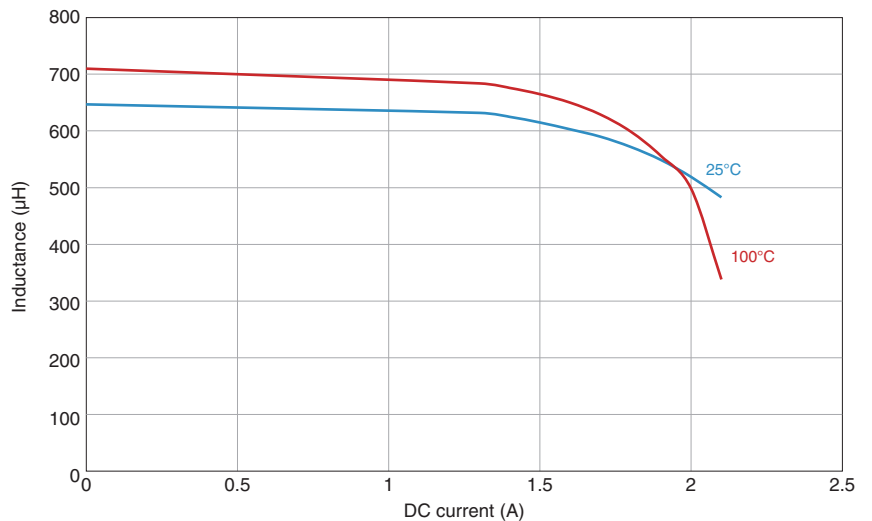
*2 Measurement Condition : Sense 1.0mA, f=50 or 60Hz

SAFETY DISTANCE

	Creepage distance	Air clearance
Pri.-Sec.	4.0mm min. (CTI I) 6.0mm min. (CTI III)	4.0mm min.
Coil-Core	2.0mm min. (CTI I) 3.0mm min. (CTI III)	2.0mm min.

INDUCTANCE CHANGE VS. BIAS CHARACTERISTICS

Idc (A)	25°C (μ H)	100°C (μ H)
0	647	710
1.3	632	684
1.4	625	676
1.5	615	665
1.6	603	650
1.7	590	629
1.8	572	599
1.9	549	556
2.0	519	498
2.1	483	338



ECO2425SEO-D06V014

RELIABILITY TESTS

Item	Standards	Test methods
Vibration resistance		Sweep 1.5mm amplitude and 10-to-55-to-10Hz in 1min in X, Y, and Z directions for 2h respectively.
Heat resistance		Measure in normal temperature after leaving in 100±2°C for 96h.
Cold resistance	Standard of inductance, insulation resistance, withstand voltage must be satisfied.	Measure in normal temperature after leaving in -40±2°C for 96h.
Humidity resistance		Measure in normal temperature after leaving in 60±2°C and 90 to 95(%)RH for 96h.
Temperature cycle		One cycle is -25°C for 30min, normal temperature for 30min, and 85°C for 30min; measure after 10 cycles of the test have been performed.
Terminal strength	9.8N min.	Apply 9.8N load in the direction of terminal axis for 30±5s. Any terminal must not be pulled out or chatter.
Solderability	Solder covers more than 90%.	Dip in solder with the temperature of 245±2°C for 3±0.5s.

NOTE

Operation Range after the assembly

- Temperature : -25°C to +115°C
(Including self temperature rise.)
- Humidity : 10 to 95%RH
(Maximum wet-bulb temperature is 38°C, without dewing)

Storage Range after the assembly

- Temperature : -25°C to +80°C
- Humidity : 10 to 95%RH
(Maximum wet-bulb temperature is 38°C, without dewing)

Applicable Safety Standard

- IEC600335-1, IEC61558-1 (Basic Insulation)
Electrical Appliance and Material Safety Act /Japan (Basic Insulation)
IEC62368-1 (Reinforced Insulation)

*Working voltage \leq 300Vrms, Pollution degree 2

*Product is not approved to the above standard. But construction and materials are designed in accordance with safety considerations.

ECO2425SEO-D06V014

INPUT / OUTPUT OVERVIEW

Description	Symbol	Min.	Typ.	Max.	Unit	Condition
Input	Voltage	Vin	90	264	Vac	
	Frequency	f _{ac}	47	50 / 60	63	Hz
	Power Factor	PF	—	0.54	—	90 to 264Vac, Pomax
	No Load Input Power	P _{nl}	—	—	246	mW 100Vac / 230Vac
Output	Voltage	V _{out}	34.4	36.0	37.8	Vdc
	Current	I _{out}	0	0.6	0.6	A
	Ripple Voltage	V _{ripple}	—	—	150	mV 20MHz Bandwidth, 90 to 264Vac, Pomax
	Efficiency	Eff	—	85 / 85	—	% 100Vac / 230Vac, Pomax

TEMPERATURE RISE

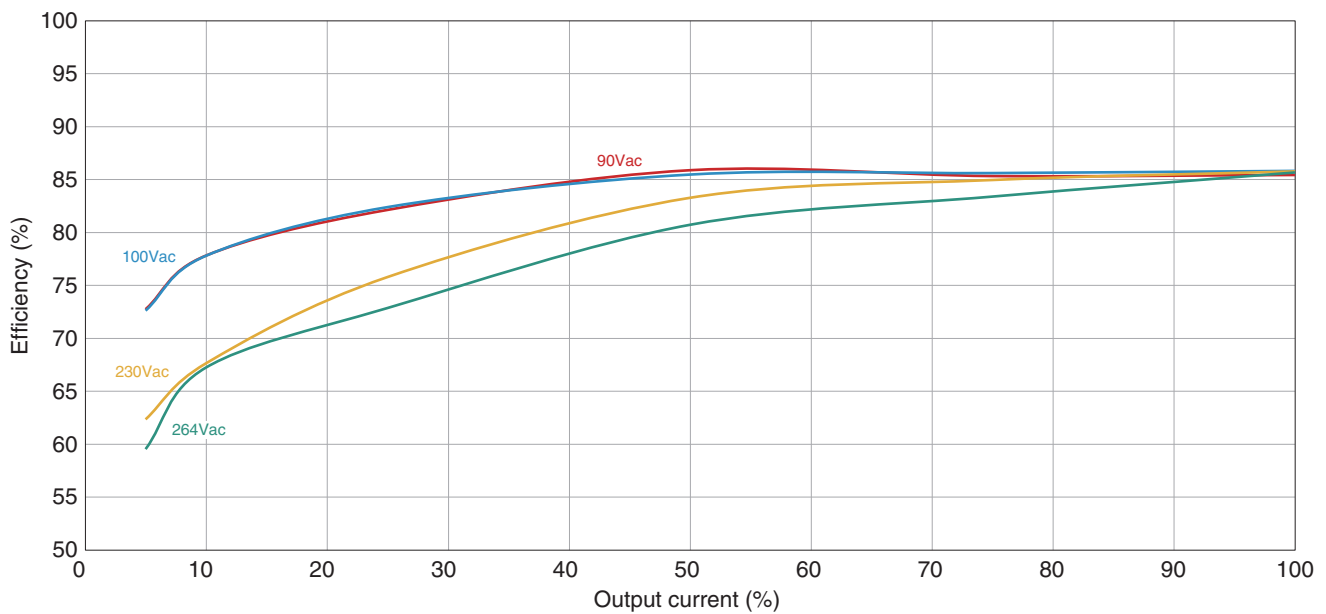
No.	Component	90Vac		100Vac		230Vac		264Vac	
		(°C)	ΔT (°C)	(°C)	ΔT (°C)	(°C)	ΔT (°C)	(°C)	ΔT (°C)
1	Ambient	27.0	—	27.0	—	27.0	—	27.0	-
2	CM choke	49.5	22.5	45.0	18.0	39.1	12.1	38.2	11.2
3	D1	48.7	21.7	45.6	18.6	40.5	13.5	39.7	12.7
4	TH1	71.6	44.6	66.3	39.3	50.7	23.7	49.1	22.1
5	C5	45.5	18.5	43.5	16.5	43.1	16.1	42.5	15.5
6	IC	57.6	30.6	56.9	29.9	66.6	39.6	66.6	39.6
7	T1(wire)	47.4	20.4	48.1	21.1	53.0	26.0	53.3	26.3
8	T1(core)	45.6	18.6	46.7	19.7	52.6	25.6	53.0	26.0
9	D51	41.3	14.3	41.0	14.0	41.4	14.4	41.3	14.3
10	L51	37.4	10.4	37.2	10.2	38.2	11.2	38.2	11.2
11	C51	33.8	6.8	33.8	6.8	34.4	7.4	34.4	7.4

Note: Test transformer was away from PWB surface about 3cm.

ECO2425SEO-D06V014

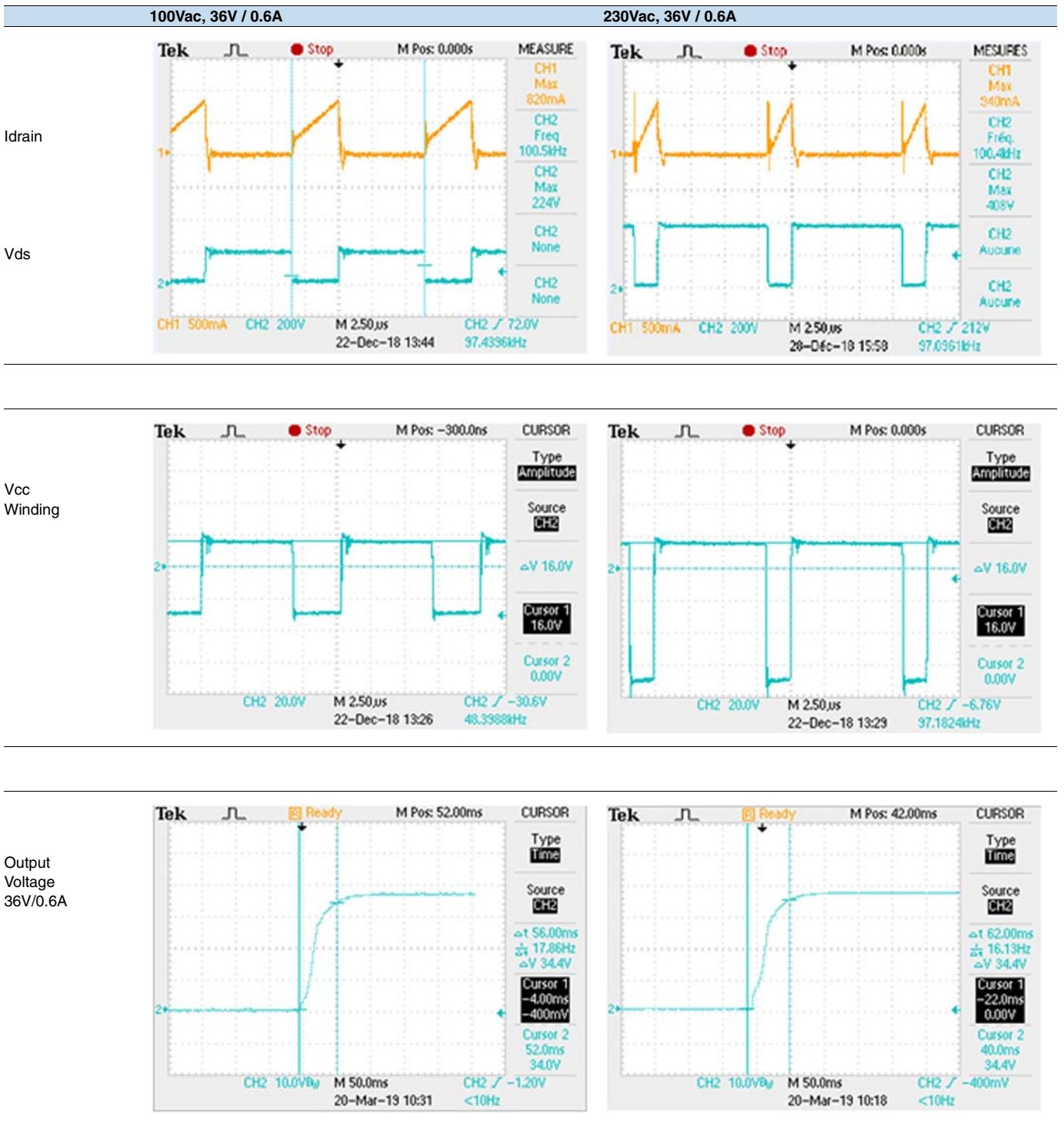
LOAD REGULATION

Input voltage (Vac)	36V Output current (%)	(A)	Input power (W)	Input current (A)	Power factor	36V Voltage (Vdc)	Efficiency (%)
90	0%	0.00	0.177	0.009	0.22	35.39	0.0
	5%	0.03	1.459	0.039	0.42	35.39	72.8
	10%	0.06	2.728	0.067	0.45	35.39	77.8
	25%	0.15	6.462	0.139	0.51	35.39	82.1
	50%	0.30	12.360	0.249	0.54	35.39	85.9
	75%	0.45	18.660	0.362	0.57	35.39	85.3
	100%	0.60	24.850	0.471	0.58	35.39	85.4
100	0%	0.00	0.180	0.009	0.19	35.39	0.0
	5%	0.03	1.462	0.036	0.41	35.39	72.6
	10%	0.06	2.729	0.061	0.44	35.39	77.8
	25%	0.15	6.442	0.128	0.50	35.39	82.4
	50%	0.30	12.420	0.231	0.53	35.39	85.5
	75%	0.45	18.600	0.333	0.55	35.39	85.6
	100%	0.60	24.740	0.431	0.57	35.39	85.8
230	0%	0.00	0.246	0.016	0.06	35.39	0.0
	5%	0.03	1.703	0.027	0.27	35.39	62.3
	10%	0.06	3.139	0.040	0.33	35.39	67.6
	25%	0.15	7.003	0.077	0.39	35.39	75.8
	50%	0.30	12.746	0.128	0.43	35.39	83.3
	75%	0.45	18.740	0.182	0.45	35.39	85.0
	100%	0.60	24.750	0.230	0.46	35.39	85.8
264	0%	0.00	0.271	0.019	0.06	35.39	0.0
	5%	0.03	1.783	0.028	0.24	35.39	59.5
	10%	0.06	3.157	0.039	0.31	35.39	67.3
	25%	0.15	7.284	0.072	0.38	35.39	72.9
	50%	0.30	13.150	0.119	0.41	35.39	80.7
	75%	0.45	19.100	0.166	0.43	35.40	83.4
	100%	0.60	24.790	0.208	0.45	35.40	85.7



ECO2425SEO-D06V014

REFERENCE WAVEFORM



⚠ Please be sure to request delivery specifications that provide further details on the features and specifications of the products for proper and safe use. (8/10)
Please note that the contents may change without any prior notice due to reasons such as upgrading.