



Certificate Number: 20191120-X3-A6043

Date: 2023-07-25

UL CONDITIONS OF ACCEPTABILITY

Company Name: TRACO ELECTRONIC AG

File-CCN: E188913- QQJQ2, QQJQ8

Product Description: DC-DC Converter

Models: THN 20-3611BUIR-B2(a), THN 20-3611UIR-B2(a), THN 20-3612UIR-B2(a), THN 20-3613UIR-B2(a), THN 20-3615UIR-B2(a), THN 20-3622UIR-B2(a), THN 20-3623UIR-B2(a), THN 20-7211BUIR-B2(a), THN 20-7211UIR-B2(a), THN 20-7212UIR-B2(a), THN 20-7213UIR-B2(a), THN 20-7215UIR-B2(a), THN 20-7222UIR-B2(a), THN 20-7223UIR-B2(a), THN 15-3611BUIR(a), THN 15-3611UIR(a), THN 15-3612UIR(a), THN 15-3613UIR(a), THN 15-3615UIR(a), THN 15-3622UIR(a), THN 15-3623UIR(a), THN 15-7211BUIR(a), THN 15-7211UIR(a), THN 15-7212UIR(a), THN 15-7213UIR(a), THN 15-7215UIR(a), THN 15-7222UIR(a), THN 15-7223UIR(a), THN 20-3611BUIR(a), THN 20-3611UIR(a), THN 20-3612UIR(a), THN 20-3613UIR(a), THN 20-3615UIR(a), THN 20-3622UIR(a), THN 20-3623UIR(a), THN 20-7211BUIR(a), THN 20-7211UIR(a), THN 20-7212UIR(a), THN 20-7213UIR(a), THN 20-7215UIR(a), THN 20-7222UIR(a), THN 20-7223UIR(a), THN 20-3611BUIR-NB2(a), THN 20-3611UIR-NB2(a), THN 20-3612UIR-NB2(a), THN 20-3613UIR-NB2(a), THN 20-3615UIR-NB2(a), THN 20-3622UIR-NB2(a), THN 20-3623UIR-NB2(a), THN 20-7211BUIR-NB2(a), THN 20-7211UIR-NB2(a), THN 20-7212UIR-NB2(a), THN 20-7213UIR-NB2(a), THN 20-7215UIR-NB2(a), THN 20-7222UIR-NB2(a), THN 20-7223UIR-NB2(a), THN 15-3611BUIR-N(a), THN 15-3611UIR-N(a), THN 15-3612UIR-N(a), THN 15-3613UIR-N(a), THN 15-3615UIR-N(a), THN 15-3622UIR-N(a), THN 15-3623UIR-N(a), THN 15-7205UIR-N(a), THN 15-7211UIR-N(a), THN 15-7212UIR-N(a), THN 15-7213UIR-N(a), THN 15-7215UIR-N(a), THN 15-7222UIR-N(a), THN 15-7223UIR-N(a), THN 20-3611BUIR-N(a), THN 20-3611UIR-N(a), THN 20-3612UIR-N(a), THN 20-3613UIR-N(a), THN 20-3615UIR-N(a), THN 20-3622UIR-N(a), THN 20-7211BUIR-N(a), THN 20-7211UIR-N(a), THN 20-7212UIR-N(a), THN 20-7213UIR-N(a), THN 20-7215UIR-N(a), THN 20-7222UIR-N(a), THN 20-7223UIR-N(a), THN 20-3611BUIR-B2(a), THN 20-7211BUIR-B2(a), THN 15-3611BUIR(a), THN 15-7211BUIR(a), THN 20-3611BUIR(a), THN 20-7211BUIR(a), THN 20-3611BUIR-NB2(a), THN 20-7211BUIR-NB2(a), THN 15-3611BUIR-N(a), THN 15-7211BUIR-N(a), THN 20-3611BUIR-N(a), THN 20-7211BUIR-N(a), THN 15-3611BUIRA1(a), THN 15-7211BUIRA1(a), THN 15-3611BUIRB1(a), THN 15-7211BUIRB1(a), THN 20-3611BUIRA1(a), THN 20-7211BUIRA1(a), THN 20-3611BUIRB1(a), THN 20-7211BUIRB1(a)

Conditions Of Acceptability: Engineering Conditions of Acceptability

For use only in or with complete equipment where the acceptability of the combination is determined by UL LLC. When installed in an end-product, consideration must be given to the following:

- The following output circuits are at ES1 energy levels : Output
- The following output circuits are at PS2 energy levels : Output
- The investigated Pollution Degree is : 2
- Proper bonding to the end-product main protective earthing termination is : Not required
- The following end-product enclosures are required : Electrical, Fire, Mechanical
- The terminals of the DC-DC Converter are only suitable for factory wiring only.

- The need for suitable electrical enclosure (for ES safeguard), fire enclosure (for PS safeguard), mechanical enclosure (for MS safeguard) and safeguard for thermal burn injury (for TS safeguard) is to be evaluated and provided (if necessary) in the end-product.
- The DC-DC Converter was evaluated for Functional Insulation and is intended to be installed in an isolated secondary hazardous voltage which is separated from a.c. mains circuit (or primary circuits) by Double or Reinforce Insulation.
- Tests for Abnormal operating and Single Fault conditions were carried out with an external, time-delay fuse having a current rating 4.0 A for RCD20-36xyU, RCD20-72xyU , YY115-36 series; 2.0 A for YY115-72 series, manufacturer by Littelfuse, type 215; Tests should be repeated when it's employed in the end-use equipment with a differently rated overcurrent protective device.
- Prospective touch voltage has been considered on converter output pins, touch voltage with respect to earth may be considered in the end product.
- The equipment was evaluated for a maximum operating altitude of 5000 m.

Ratings:

Model name	Input voltage (V d.c.)	Input current (mA)	Output voltage (V d.c.)	Output current (mA)	Output power (W)	PCB Layout	TX01 No.
THN 20-3611BUIR-B2, THN 20-3611BUIR, THN 20-3611BUIR-NB2, THN 20-3611BUIR-N, THN 20-3611BUIR-B2, THN 20-3611BUIR, THN 20-3611BUIR-NB2, THN 20-3611BUIR-N, THN 20-3611BUIRA1, THN 20-3611BUIRB1	9 -75	2554	5	4000	20	A	1
THN 20-3611UIR-B2, THN 20-3611UIR, THN 20-3611UIR-NB2, THN 20-3611UIR-N	9 -75	2605	5.1	4000	20.4	A	1
THN 20-3612UIR-B2, THN 20-3612UIR, THN 20-3612UIR-NB2, THN 20-3612UIR-N	9 -75	2530	12	1670	20.04	A	2
THN 20-3613UIR-B2, THN 20-3613UIR, THN 20-3613UIR-NB2, THN 20-3613UIR-N	9 -75	2519	15	1330	19.95	A	3
THN 20-3615UIR-B2, THN 20-3615UIR, THN 20-3615UIR-NB2, THN 20-3615UIR-N	9 -75	2530	24	835	20.04	A	4
THN 20-3622UIR-B2, THN 20-3622UIR, THN 20-3622UIR-NB2, THN 20-3622UIR-N	9 -75	2524	± 12	± 833	19.99	B	5
THN 20-3623UIR-B2, THN 20-3623UIR, THN 20-3623UIR-NB2, THN 20-3623UIR-N	9 -75	2527	± 15	± 667	20.01	B	6
THN 20-7211BUIR-B2, THN 20-7211BUIR, THN 20-7211BUIR-NB2, THN 20-7211BUIR-N, THN 20-7211BUIR-B2, THN 20-7211BUIR, THN 20-7211BUIR-NB2, THN 20-7211BUIR-N, THN 20-7211BUIRA1, THN 20-7211BUIRB1	14 -160	1642	5	4000	20	A	7
THN 20-7211UIR-B2, THN 20-7211UIR, THN 20-7211UIR-NB2, THN 20-7211UIR-N	14 -160	1675	5.1	4000	20.4	A	7
THN 20-7212UIR-B2, THN 20-7212UIR, THN 20-7212UIR-NB2, THN 20-7212UIR-N	14 -160	1627	12	1670	20.04	A	8

THN 20-7213UIR-B2, THN 20-7213UIR, THN 20-7213UIR-NB2, THN 20-7213UIR-N	14 -160	1619	15	1330	19.95	A	9
THN 20-7215UIR-B2, THN 20-7215UIR, THN 20-7215UIR-NB2, THN 20-7215UIR-N	14 -160	1627	24	835	20.04	A	10
THN 20-7222UIR-B2, THN 20-7222UIR, THN 20-7222UIR-NB2, THN 20-7222UIR-N	14 -160	1623	± 12	± 833	19.99	B	11
THN 20-7223UIR-B2, THN 20-7223UIR, THN 20-7223UIR-NB2, THN 20-7223UIR-N	14 -160	1624	± 15	± 667	20.01	B	12
THN 15-3611BUIR, THN 15-3611BUIR-N, THN 15-3611BUIR, THN 15-3611BUIR-N, THN 15-3611BUIRA1, THN 15-3611BUIRB1	9 -75	1916	5	3000	15	A	1
THN 15-3611UIR, THN 15-3611UIR-N	9 -75	1954	5.1	3000	15.3	A	1
THN 15-3612UIR, THN 15-3612UIR-N	9 -75	1894	12	1250	15	A	2
THN 15-3613UIR, THN 15-3613UIR-N	9 -75	1894	15	1000	15	A	3
THN 15-3615UIR, THN 15-3615UIR-N	9 -75	1894	24	625	15	A	4
THN 15-3622UIR, THN 15-3622UIR-N	9 -75	1916	± 12	± 625	15	B	5
THN 15-3623UIR, THN 15-3623UIR-N	9 -75	1894	± 15	± 500	15	B	6
THN 15-7211BUIR, THN 15-7205UIR-N, THN 15-7211BUIR, THN 15-7211BUIR-N, THN 15-7211BUIRA1, THN 15-7211BUIRB1	14 -160	1232	5	3000	15	A	7
THN 15-7211UIR, THN 15-7211UIR-N	14 -160	1256	5.1	3000	15.3	A	7
THN 15-7212UIR, THN 15-7212UIR-N	14 -160	1218	12	1250	15	A	8
THN 15-7213UIR, THN 15-7213UIR-N	14 -160	1232	15	1000	15	A	9
THN 15-7215UIR, THN 15-7215UIR-N	14 -160	1232	24	625	15	A	10
THN 15-7222UIR, THN 15-7222UIR-N	14 -160	1232	± 12	± 625	15	B	11
THN 15-7223UIR, THN 15-7223UIR-N	14 -160	1232	± 15	± 500	15	B	12

Nomenclature: (a) - Stands for 6 variables, each variable may be A through Z, 0 through 9, "-", "(", ")", ".", "/" or blank.

Certificate Number: 20191120-X3-A6037

File-CCN: E188913- QQJQ2, QQJQ8

Product Description: DC-DC Converter

Models: TIM 6-1211-A2(a), TIM 6-1212-A2(a), TIM 6-1213-A2(a), TIM 6-1221-A2(a), TIM 6-1222-A2(a), TIM 6-1223-A2(a), TIM 6-2411-A2(a), TIM 6-2412-A2(a), TIM 6-2413-A2(a), TIM 6-2421-A2(a), TIM 6-2422-A2(a), TIM 6-2423-A2(a), TIM 6-4811-A2(a), TIM 6-4812-A2(a), TIM 6-4813-A2(a), TIM 6-4821-A2(a), TIM 6-4822-A2(a), TIM 6-4823-A2(a)

Conditions Of Acceptability: Engineering Conditions of Acceptability

For use only in or with complete equipment where the acceptability of the combination is determined by UL LLC. When installed in an end-product, consideration must be given to the following:

- The following output circuits are at ES1 energy levels : Output
- The following output circuits are at PS2 energy levels : Output
- The investigated Pollution Degree is : 2
- Proper bonding to the end-product main protective earthing termination is : Not required
- The following end-product enclosures are required : Electrical, Fire, Mechanical
- The terminals of the DC-DC Converter are only suitable for factory wiring only.
- The need for suitable electrical enclosure (for ES safeguard), fire enclosure (for PS safeguard), mechanical enclosure (for MS safeguard) and safeguard for thermal burn injury (for TS safeguard) is to be evaluated and provided (if necessary) in the end-product.
- The DC-DC Converter was evaluated for Reinforced Insulation between input and output circuits and is intended to be supplied by an isolated or non-isolated DC source.
- Tests for Abnormal operating and Single Fault conditions were carried out with an external, time-delay fuse having a current rating 1.25 A for MPK06-12 series; 0.63 A for MPK06-24 series; 0.315 A for MPK06-48 series, manufactured by Littelfuse, type 215; Tests should be repeated when it's employed in the end-use equipment with a differently rated overcurrent protective device.
- Prospective touch voltage has been considered on converter output pins, touch voltage with respect to earth may be considered in the end product.
- The equipment was evaluated for a maximum operating altitude of 5000 m and clearances were considered and the required clearances were multiplied with an altitude correction factor of 1.48.

Ratings:

Model Name	PCB	Schematics	Input Range	IIN (A)	VOUT (V d.c.)	IOUT (mA)	POUT (VA)	T1
TIM 6-1211-A2	C	Single-output	9-18 V d.c.	0.794	5	1200	6	A
TIM 6-1212-A2	C	Single-output	9-18 V d.c.	0.766	12	500	6	B
TIM 6-1213-A2	C	Single-output	9-18 V d.c.	0.775	15	400	6	C
TIM 6-2411-A2	C	Single-output	18-36 V d.c.	0.397	5	1200	6	A
TIM 6-2412-A2	C	Single-output	18-36 V d.c.	0.383	12	500	6	B
TIM 6-2413-A2	C	Single-output	18-36 V d.c.	0.383	15	400	6	C
TIM 6-1221-A2	D	Dual-output	9-18 V d.c.	0.803	± 5	±600	6	A
TIM 6-1222-A2	D	Dual-output	9-18 V d.c.	0.766	± 12	±250	6	B
TIM 6-1223-A2	D	Dual-output	9-18 V d.c.	0.775	± 15	±200	6	C
TIM 6-2421-A2	D	Dual-output	18-36 V d.c.	0.397	± 5	±600	6	A
TIM 6-2422-A2	D	Dual-output	18-36 V d.c.	0.388	± 12	±250	6	B
TIM 6-2423-A2	D	Dual-output	18-36 V d.c.	0.388	± 15	±200	6	C
TIM 6-4811-A2	C	Single-output	36-75 V d.c.	0.198	5	1200	6	D
TIM 6-4812-A2	C	Single-output	36-75 V d.c.	0.192	12	500	6	E

TIM 6-4813-A2	C	Single-output	36-75 V d.c.	0.194	15	400	6	E
TIM 6-4821-A2	D	Dual-output	36-75 V d.c.	0.201	± 5	±600	6	D
TIM 6-4822-A2	D	Dual-output	36-75 V d.c.	0.192	± 12	±250	6	E
TIM 6-4823-A2	D	Dual-output	36-75 V d.c.	0.196	± 15	±200	6	E

Nomenclature: (a)- stands for 6 variables, each variable may be A through Z, 0 through 9, dash, any punctuation marks or blank.