

L.T.E

LI TONE ELECTRONICS CO.,LTD
力英電子股份有限公司

MTBF (Mean Time Between Failure) Report

Model No. LTE36E-S5 48V/0.75A

Standard: MIL-HDBK-217F NOTICE2

Test Condition : 115Vac/60Hz/0.75A

Test Condition : 230Vac/50Hz/0.75A

Ambient Temperature 25 °C

Total λp 2.97

MTBF 336435.35 Hrs 38.4 Year

Ambient Temperature: 25 °C

Total λp 3.05

MTBF 328172.06 Hrs 37.46 Year

Ambient Temperature 40 °C

Total λp 4.54

MTBF 220107.46 Hrs 25.1 Year

Ambient Temperature: 40 °C

Total λp 4.67

MTBF 214307.66 Hrs 24.46 Year

Remark:1.This MTBF is calculated according to the newest standards (MIL-HDBK-217F)

2.Environment factor(πE) is base on Ground Beni GB

3.Quality factor(πQ) is base on lower πQ

APPROVE BY:Martin

TESTING BY Ryan

DATE: 2012/1/16

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IC														
Device :	$\lambda_p = (C_1 \pi_T + C_2 \pi_E) \pi_Q \pi_L$	C2 : Package Failure Rate for all Microcircuits	π_E : Environment Factor											
	Tj : Component Temperature	π_T : Temperature Factor	π_Q : Quality Factor											
	C1 : Die Complexity Failure Rates	$\pi_T = 0.1 * \text{EXP}(-0.65/0.00008617 * ((1/(Tj+273))-1/298))$	π_L : Learning Factor											
Product:	LTE36E-SS 48V/0.75A													
Room Temperature:	25 °C													
	U2	IC1												
Part number	TL431ACZ	OB2269CCP												
Voltage Rated(V)														
Current Rated(A)														
Vender	ST	ON BRIGHT												
Part type	IC	IC												
Package	TO-92	SOP-8												
Np	3	8												
Temp. Factor														
π_T @115Vac 25 °C	0.89	1.03												
π_T @115Vac 40 °C	2.45	2.82												
π_T @230Vac 25 °C	0.88	1.00												
π_T @230Vac 40 °C	2.43	2.73												
C1	0.01	0.01												
C2	0.0009	0.0026												
Power Factor- π_S														
π_L	1.045849856	1.045849856												
Quality Factor- π_Q	10	10												
Environ.Factor- π_E	0.5	0.5												
λ_p @115Vac 25 °C	0.097426752	0.121995222												
λ_p @115Vac 40 °C	0.260966463	0.309006249												
λ_p @230Vac 25 °C	0.096771809	0.118270457												
λ_p @230Vac 40 °C	0.25931053	0.299696283												
Vf on Imax (V)														
Vf on Iavg (V)														
Rthj-c/W														
Rthj-a/W														
Vp-p(V)@115Vac														
Vp-p(V)@230Vac														
Vrms (V)@115Vac														
Vrms (V)@230Vac														
Irms (A)@115Vac														
Irms (A)@230Vac														
Iavg(A)@115Vac														
Iavg(A)@230Vac														
Measure Temp.(°C)@115Vac Room Temp.	53.1	55.3												
Measure Temp.(°C)@230Vac Room Temp.	53.0	54.8												
Temp. Rise ΔT (°C)@115Vac	28.1	30.3												
Temp. Rise ΔT (°C)@230Vac	28.0	29.8												
Tc @115Vac 25 °C	53.1	55.3												
Tc @115Vac 40 °C	68.1	70.3												
Tc @230Vac 25 °C	53.0	54.8												
Tc @230Vac 40 °C	68.0	69.8												
Power Diss.(W)														
Tj @115Vac 25 °C	53.1	55.3												
Tj @115Vac 40 °C	68.1	70.3												
Tj @230Vac 25 °C	53.0	54.8												
Tj @230Vac 40 °C	68.0	69.8												

$\Sigma \lambda_p$ @115Vac
 $\Sigma \lambda_p$ @115Vac

25 °C
40 °C

0.21942
0.56997

$\Sigma \lambda_p$ @230Vac
 $\Sigma \lambda_p$ @230Vac

25 °C
40 °C

0.21504
0.55901

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MOSFET													
Device :	$\lambda p = \lambda b \times \pi T \times \pi A \times \pi E$	πT : Temperature Facto = $\exp(-1925((1/(T)+273)-(1/298)))$	πA : Application Factor :	Linear Amplification (Pr < 2W)	1.5	πQ : Quality Factor							
	Tc : Component Temperature			Switching = 0.7	0.7	πE : Environment Factor:GB							
	λb : Base Failure Rate = 0.012			Power FETS (Non-linear , Pr >= 2W)	2-10								
Product:	LTE36E-S5 48V/0.75A												
Room Temperature:	25 °C												
Q1													
Part number	FTA04N65												
Voltage Rated(V)	650												
Current Rated(A)	4												
Vender	IPS												
Part type	MOSFET												
Package	TO-220FP												
λb	0.012												
Temp. Factor													
πT @ 115Vac 25 °C	10.31												
πT @ 115Vac 40 °C	11.73												
πT @ 230Vac 25 °C	9.99												
πT @ 230Vac 40 °C	11.38												
πA	0.7												
Rds	2.2												
Power Factor- πS													
Pr(Actual)	0.6948568												
Quality Factor- πQ	5.5												
Environ.Factor- πE	1												
λp @115Vac 25 °C	0.476446219												
λp @115Vac 40 °C	0.541800711												
λp @230Vac 25 °C	0.461399774												
λp @230Vac 40 °C	0.525727871												
VT on Imax (V)													
VT on Iavg (V)													
Rth(j-e)/°C/W	5.2												
Rth(j-a)/°C/W													
Vp-p(V)@115Vac	269												
Vp-p(V)@230Vac	438												
Vrms (V)@115Vac													
Vrms (V)@230Vac													
Irms (A)@115Vac	0.562												
Irms (A)@230Vac	0.380												
Iavg(A)@115Vac													
Iavg(A)@230Vac													
Measure Temp.(°C)@115Vac Room Temp.	65.1												
Measure Temp.(°C)@230Vac Room Temp.	61.5												
Temp. Rise $\Delta T(C) @ 115Vac$	40.1												
Temp. Rise $\Delta T(C) @ 230Vac$	36.5												
Tc @ 115Vac 25 °C	65.1												
Tc @ 115Vac 40 °C	80.1												
Tc @ 230Vac 25 °C	61.5												
Tc @ 230Vac 40 °C	76.5												
Power Diss (W)	24												
Tj @ 115Vac 25 °C	189.9												
Tj @ 115Vac 40 °C	204.9												
Tj @ 230Vac 25 °C	186.3												
Tj @ 230Vac 40 °C	201.3												

$\Sigma \lambda p$ @115Vac
 $\Sigma \lambda p$ @115Vac

25 °C
40 °C

0.47645
0.54180

$\Sigma \lambda p$ @230Vac
 $\Sigma \lambda p$ @230Vac

25 °C
40 °C

0.46140
0.52573

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Diode(Low Frequency), Zener,Varistor						
Device :	$\lambda p = \lambda b \times \pi T \times \pi S \times \pi C \times \pi Q \times \pi E$		πT : Temperature Factor		πQ : Quality Factor	
	Tj : Component Temperature		=exp(-3091(1/(Tj+Rth(j-c))*Irms*Vf))+273)-(1/298))----Diode,Varistor,Voltage Reference		πE : Environment Factor	
	λb : Base Failure Rate		=exp(-2790(1/(Tj+273)-(1/298)))-Zener			
Product:	LTE36E-S5 48V/0.75A					
Room Temperature:	25 °C					
	BD01	D01	D03	D10	DZ2	D02
Part number	KBP206G	PR1007	1N4148	STPR1040CTW	HZ30-2	RS1006FL
Voltage Rated(V)	600	1000	100	400	30	600
Current Rated(A)	2	1	0	10		1
Vender	LITEON	LITEON	PHILIPS	LITEON	RENESAS	PANJIT
Part type	Bridge Diode	FAST DIODE	SWITCHING DIODE	SUPER FAST DIODE	ZENER	FAST DIODE
Package	DF	DO-41	DO-15	TO-220AB	DO-35	SOD123
λb	0.0038	0.025	0.001	0.025	0.002	0.025
Temp. Factor						
πT @115Vac 25 °C	3.640021850	3.348572765	3.092754658	3.295881070	2.374150006	2.703235100
πT @115Vac 40 °C	5.340080234	4.946651427	4.599230745	4.875258421	3.610982298	4.066013926
πT @230Vac 25 °C	2.781014947	3.127098828	2.917267909	3.555086728	2.360295208	2.672606739
πT @230Vac 40 °C	4.172926051	4.645993494	4.359672068	5.225673849	3.591723205	4.023850087
Power Factor- πS	0.054	0.054	0.054	0.128625876	1.049296967	0.054
πC	1	1	1	1	1	1
Quality Factor- πQ	5.5	5.5	5.5	5.5	5.5	5.5
Environ.Factor- πE	1	1	1	1	1	1
λp @115Vac 25 °C	0.00410813	0.02486315	0.00091855	0.05829114	0.02740307	0.02007152
λp @115Vac 40 °C	0.00602681	0.03672889	0.00136597	0.08622410	0.04167892	0.03019015
λp @230Vac 25 °C	0.00313865	0.02321871	0.00086643	0.06287547	0.02724316	0.01984411
λp @230Vac 40 °C	0.00470956	0.03449650	0.00129482	0.09242157	0.04145663	0.02987709
Vf on Imax (V)	1.1	1.2	1.0	1.3		1.15
Rth(j-c)/W				4.2		
Rth(j-a)/W						
Vp-p(V)@115Vac	164	256	5.88	172	30.6	49.4
Vp-p(V)@230Vac	328	444	5.88	291	30.6	86.0
Vrms (V)@115Vac						
Vrms (V)@230Vac						
Irms (A)@115Vac	0.674	0.085	0.0303	1.157		0.0218
Irms (A)@230Vac	0.426	0.082	0.0276	1.142		0.0184
Iavg(A)@115Vac						
Iavg(A)@230Vac						
Measure Temp.(°C)@115Vac Room Temp.	67.4	64.3	61.4	57.4	52.1	56.6
Measure Temp.(°C)@230Vac Room Temp.	57.6	61.8	59.3	60.2	51.9	56.2
Temp. Rise,△						
T(°C)@115Vac	42.4	39.3	36.4	32.4	27.1	31.6
Temp. Rise,△						
T(°C)@230Vac	32.6	36.8	34.3	35.2	26.9	31.2
Tc @115Vac 25 °C	67.4	64.3	61.4	57.4	52.1	56.6
Tc @115Vac 40 °C	82.4	79.3	76.4	72.4	67.1	71.6
Tc @230Vac 25 °C	57.6	61.8	59.3	60.2	51.9	56.2
Tc @230Vac 40 °C	72.6	76.8	74.3	75.2	66.9	71.2
Power Diss.(W)					0.5	
Tj @115Vac 25 °C	67.4	64.3	61.4	57.4	52.1	56.6
Tj @115Vac 40 °C	82.4	79.3	76.4	72.4	67.1	71.6
Tj @230Vac 25 °C	57.6	61.8	59.3	60.2	51.9	56.2
Tj @230Vac 40 °C	72.6	76.8	74.3	75.2	66.9	71.2

$\Sigma \lambda p$ @115Vac
 $\Sigma \lambda p$ @115Vac

25 °C
40 °C

0.13566
0.20221

$\Sigma \lambda p$ @230Vac
 $\Sigma \lambda p$ @230Vac

25 °C
40 °C

0.13719
0.20426

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Optoelectronics, Detectors, LED																				
Device :	$\lambda_p = \lambda_{bx} \pi T \times \pi Q \times \pi E$		π_T : Temperature Factor		π_E : Environment Factor															
	Tj : Component Temperature		$= \exp(-2790(1/T_j + 273) - (1/298))$																	
	λ_b : Base Failure Rate		π_Q : Quality Factor																	
Product:	LTE36E-S5 48V/0.75A																			
Room Temperature:	25 °C																			
	LED	U01																		
Part number	LC034GD-5MA	LTV-817-M																		
Voltage Rated(V)																				
Current Rated(A)																				
Vender	LENOO	LITEON																		
Part type	LED	OPTO																		
Package	3ψ	DIP-4																		
λ_b	0.04	0.04																		
Temp. Factor																				
π_T @ 115Vac 25 °C	1.97	2.38																		
π_T @ 115Vac 40 °C	2.90	3.45																		
π_T @ 230Vac 25 °C	1.90	2.45																		
π_T @ 230Vac 40 °C	2.81	3.54																		
$\pi_A / C1$																				
Rds /πR / C2																				
Power Factor-π S																				
Pt(Actual) / π c/ π L																				
Quality Factor-π Q	8	8																		
Environ.Factor-π E	1	1																		
λ_p @ 115Vac 25 °C	0.629269905	0.761279216																		
λ_p @ 115Vac 40 °C	0.927140702	1.103344290																		
λ_p @ 230Vac 25 °C	0.607445004	0.783179795																		
λ_p @ 230Vac 40 °C	0.897750397	1.132342012																		
Vf on Imax (V)																				
Vf on Iavg (V)																				
Rth(j-c) /W																				
Rth(j-a) /W																				
Vp-p(V)@115Vac																				
Vp-p(V)@230Vac																				
Vrms (V)@115Vac																				
Vrms (V)@230Vac																				
Irms (A)@115Vac																				
Irms (A)@230Vac																				
Iavg(A)@115Vac																				
Iavg(A)@230Vac																				
Measure Temp.(°C)@ 115Vac Room Temp.	48.2	55.4																		
Measure Temp.(°C)@ 230Vac Room Temp.	46.9	56.5																		
Temp. Rise,Δ T(C)@115Vac	23.2	30.4																		
Temp. Rise,Δ T(C)@230Vac	21.9	31.5																		
Tc @115Vac 25 °C	48.2	55.4																		
Tc @115Vac 40 °C	63.2	70.4																		
Tc @230Vac 25 °C	46.9	56.5																		
Tc @230Vac 40 °C	61.9	71.5																		
Power Diss.(W)																				
Tj @115Vac 25 °C	48.2	55.4																		
Tj @115Vac 40 °C	63.2	70.4																		
Tj @230Vac 25 °C	46.9	56.5																		
Tj @230Vac 40 °C	61.9	71.5																		

$\Sigma \lambda_p$ @115Vac
 $\Sigma \lambda_p$ @115Vac

25 °C
40 °C

1.39055
2.03048

$\Sigma \lambda_p$ @230Vac
 $\Sigma \lambda_p$ @230Vac

25 °C
40 °C

1.39062
2.03009

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Resistor																													
Device :	$\lambda p = \lambda b \times \pi T \times \pi P \times \pi S \times \pi Q \times \pi E$											πT : Temperature Factor = $-\text{EXP}(-\text{Ea}/0.00008617 \times (1/(T_1) - 1/298))$						πP : Power Factor = $(\text{Power Dissipation})^{0.39}$						πE : Environment Factor					
	Tj : Component Temperature											πA : Application Factor						πS : Power Stress Factor = $0.71 \times \text{EXP}(1.1 \times (\text{Power Dissipation} / \text{Power Rate}))$											
	λb : Base Failure Rate											πR : Power Rating Factor						πQ : Quality Factor											
Product:	LTE36E-S5 48V/0.75A																												
Room Temperature	25 °C																												
Parts Location	R10	R15	R21	RTH1	R01	R02	R13A	R13B	R13C	R13D	R25	R08	R29	R03A	R03B	R03C	R03D	R04	R30	R31	R07	R09	R28	R14	R33				
Part description	100	750000	22	5	1000000	1000000	1.6	1.6	1.6	1.6	220	24000	3000	300000	300000	300000	300000	30	33000	470	4.7	510	51000	750000	91000				
Rated Power(W)	0.125	0.25	2	20	0.25	0.25	0.25	0.25	0.25	0.25	0.1	0.1	0.1	0.25	0.25	0.25	0.25	0.25	0.1	0.1	0.25	0.1	0.1	0.25	0.1				
Part type	CF	CF	MOF	NTCR	SMD	SMD	SMD	SMD	SMD	SMD	SMD	SMD	SMD	SMD	SMD	SMD	SMD	SMD	SMD	SMD	SMD	SMD	SMD	SMD	SMD	SMD			
Vender																													
Ea(eV)Effective Activation Energy	0.08	0.08	0	0	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	
λb	0.0037	0.0037	0.0037	0.0037	0.0037	0.0037	0.0037	0.0037	0.0037	0.0037	0.0037	0.0037	0.0037	0.0037	0.0037	0.0037	0.0037	0.0037	0.0037	0.0037	0.0037	0.0037	0.0037	0.0037	0.0037	0.0037	0.0037	0.0037	
Temp. Factor- πT @115Vac 25 °C	1.37	1.33	1.00	1.00	1.35	1.35	1.41	1.41	1.41	1.41	1.26	1.31	1.26	1.40	1.39	1.39	1.38	1.40	1.26	1.28	1.36	1.35	1.18	1.32	1.24				
Temp. Factor- πT @115Vac 40 °C	1.54	1.51	1.00	1.00	1.53	1.53	1.59	1.59	1.59	1.59	1.43	1.48	1.43	1.58	1.56	1.56	1.56	1.58	1.43	1.45	1.54	1.53	1.35	1.50	1.41				
Temp. Factor- πT @230Vac 25 °C	1.38	1.34	1.00	1.00	1.29	1.29	1.34	1.34	1.34	1.34	1.26	1.30	1.26	1.39	1.37	1.37	1.35	1.39	1.26	1.28	1.36	1.33	1.18	1.33	1.23				
Temp. Factor- πT @230Vac 40 °C	1.55	1.52	1.00	1.00	1.47	1.47	1.51	1.51	1.51	1.51	1.43	1.48	1.43	1.57	1.55	1.55	1.52	1.57	1.43	1.46	1.53	1.50	1.35	1.50	1.40				
Power Factor- πP	0.06	0.24	0.00	0.04	0.14	0.14	0.15	0.15	0.15	0.15	0.00	0.03	0.09	0.22	0.22	0.22	0.22	0.00	0.04	0.03	0.02	0.01	0.29	0.25	0.11				
Power Stress Factor- πS	0.7155	0.7968	0.7100	0.7100	0.7288	0.7286	0.7336	0.7336	0.7336	0.7336	0.7100	0.7113	0.7263	0.7734	0.7734	0.7734	0.7734	0.7100	0.7115	0.7112	0.7102	0.7100	1.1238	0.8008	0.7353				
Quality Factor- πQ	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10			
Environ.Factor- πE	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1			
λp @115Vac 25 °C	0.0023312	0.0095076	0.0000060	0.0010033	0.0049359	0.0049115	0.0056675	0.0056675	0.0056722	0.0056675	0.0000317	0.0011668	0.0030364	0.0086324	0.0085321	0.0085321	0.0085178	0.0000447	0.0011675	0.0010976	0.0008878	0.0002774	0.0142403	0.0096217	0.0035673				
λp @115Vac 40 °C	0.0026320	0.0107573	0.0000060	0.0010033	0.0055790	0.0055518	0.0063813	0.0063813	0.0063862	0.0063813	0.0000360	0.0013222	0.0034527	0.0097258	0.0096223	0.0096223	0.0096075	0.0000504	0.0013275	0.0012466	0.0010029	0.0003136	0.0162831	0.0108952	0.0040632				
λp @230Vac 25 °C	0.0023450	0.0095732	0.0000060	0.0010033	0.0047308	0.0047031	0.0053654	0.0053654	0.0053608	0.0053562	0.0000316	0.0011597	0.0030282	0.0085822	0.0084394	0.0084394	0.0082901	0.0000444	0.0011654	0.0011034	0.0008848	0.0002732	0.0141870	0.0096801	0.0035447				
λp @230Vac 40 °C	0.0026463	0.0108251	0.0000060	0.0010033	0.0053666	0.0053360	0.0060693	0.0060693	0.0060645	0.0060598	0.0000360	0.0013149	0.0034442	0.0096740	0.0095265	0.0095265	0.0093722	0.0000501	0.0013254	0.0012527	0.0009998	0.0003092	0.0162275	0.0109557	0.0040396				
Vrms (V)	0.297	140.23	0.0001	0.034	77.14	76.76	0.109	0.109	0.109	0.109	0.002	2.017	2.49	76.37	76.37	76.37	76.37	0.001	2.49	0.27	0.019	0.045	46.14	143.22	17.007				
Arms (A)																													
Power Dissipation(W)	0.0008821	0.0262193	4.545E-10	0.0002312	0.0059506	0.0058921	0.0074256	0.0074256	0.0074256	0.0074256	1.818E-08	0.0001695	2.067E-03	0.0194413	0.0194413	0.0194413	0.0194413	3.333E-08	0.0001879	0.0001551	0.0000768	0.0000040	0.0417431	0.0273493	0.0031784				
Measure Temperature(C)@115Vac	58.3	55.4	64.4	71.6	56.8	56.7	62.2	62.2	62.3	62.2	48.8	53.3	48.8	61.3	59.9	59.9	59.7	61.3	48.8	50.3	57.6	56.7	41.9	54.3	46.7				
Measure Temperature(C)@230Vac	59.0	56.2	77.8	55.9	51.9	51.7	55.7	55.7	55.6	55.5	48.6	52.6	48.5	60.6	58.6	58.6	56.5	60.6	48.6	50.9	57.2	54.9	41.5	55.0	46.0				
Temperature Rise ΔT (C)@115Vac	33.3	30.4	39.4	46.6	31.8	31.7	37.2	37.2	37.3	37.2	23.8	28.3	23.8	36.3	34.9	34.9	34.7	36.3	23.8	25.3	32.6	31.7	16.9	29.3	21.7				
Temperature Rise ΔT (C)@230Vac	34	31.2	52.8	30.9	26.9	26.7	30.7	30.7	30.6	30.5	23.6	27.6	23.5	35.6	33.6	33.6	31.5	35.6	23.6	25.9	32.2	29.9	16.5	30	21.0				
Tc (°C)@115Vac 25 °C	58.3	55.4	64.4	71.6	56.8	56.7	62.2	62.2	62.3	62.2	48.8	53.3	48.8	61.3	59.9	59.9	59.7	61.3	48.8	50.3	57.6	56.7	41.9	54.3	46.7				
Tc (°C)@115Vac 40 °C	73.3	70.4	79.4	86.6	71.8	71.7	77.2	77.2	77.3	77.2	63.8	68.3	63.8	76.3	74.9	74.9	74.7	76.3	63.8	65.3	72.6	71.7	56.9	69.3	61.7				
Tc (°C)@230Vac 25 °C	59	56.2	77.8	55.9	51.9	51.7	55.7	55.7	55.6	55.5	48.6	52.6	48.5	60.6	58.6	58.6	56.5	60.6	48.6	50.9	57.2	54.9	41.5	55	46.0				
Tc (°C)@230Vac 40 °C	74	71.2	92.8	70.9	66.9	66.7	70.7	70.7	70.6	70.5	63.6	67.6	63.5	75.6	73.6	73.6	71.5	75.6	63.6	65.9	72.2	69.9	56.5	70	61.0				

$\Sigma \lambda p$ @115Vac 25 °C 0.114724 $\Sigma \lambda p$ @230Vac 25 °C 0.112663
 $\Sigma \lambda p$ @115Vac 40 °C 0.129631 $\Sigma \lambda p$ @230Vac 40 °C 0.127500

L.T.E

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Capacitors															
Device :	$\lambda_p = \lambda_b \times \pi T \times \pi C \times \pi V \times \pi SR \times \pi Q \times \pi E$					πT : Temperature Factor = $-\text{EXP}(-\text{Ea} / 0.0008617 \times (1/(T_j - 273) - 1/298))$					πSR : Series Resistance Factor				
	T_j : Component Temperature					πC : Capacitance Factor					πQ : Quality Factor				
	λ_b : Base Failure Rate					πV : Voltage Stress Factor					πE : Environment Factor				
Product:	LTE36E-SS 48V.0.75A														
Room Temperature:	25 °C														
Parts Location	CY03	CY04	C02	C20	C23	C01	C21	C22	C03	CX01	C06	C09	C05	C04	C29
Capacitance(uF)	0.0022	0.0047	0.0022	0.00047	100	68	150	150	22	0.33	0.0001	0.0001	0.01	0.1	0.1
Voltage Rated(V)	250	250	1000	1000	63	400	63	52	50	300	50	50	50	50	50
Parts Series	Y1	Y1	CER	CER	AE	AE	AE	AE	AE	X1	SMD	SMD	SMD	SMD	SMD
Part type	Y5U	Y5U	Y5P	Y5P	SEK	AQ	PW	PW	PW	CTX	NPO	NPO	X7R	X7R	X7R
Vendor					TEAPO	TAICON	TAICON	TAICON	TAICON						
Ea(Ev)Effective Activation Energy	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.15	0.35	0.35	0.35	0.35	0.35
λ_b	0.00099	0.00099	0.00099	0.00099	0.00012	0.00012	0.00012	0.00012	0.00012	0.00037	0.002	0.002	0.002	0.002	0.002
Temp. Factor- πT @115V _a 25 °C	3.37491022	3.51824309	4.53868192	5.12592624	2.67642729	4.05328113	3.03200086	3.175192	4.14367659	1.75074193	3.63927923	3.65294045	3.51824309	3.83448281	2.74028113
Temp. Factor- πT @115V _a 40 °C	5.81538965	6.04082104	7.62670122	8.52649097	4.70524929	6.87621924	5.27293046	5.50000928	7.01648313	2.20324598	6.23062307	6.25201451	6.04082104	6.53569939	4.80761583
Temp. Factor- πT @230V _a 25 °C	3.40059997	3.61208517	4.18950265	4.757632146	2.74028113	3.42645354	3.19900046	3.43944202	4.03837681	1.59006855	3.96454111	3.37491022	3.86307151	3.77783658	2.7188556
Temp. Factor- πT @230V _a 40 °C	5.85584849	6.18802252	7.08749932	12.2062026	4.80761583	5.89654107	5.53863545	5.91697535	6.85306954	2.01765706	6.73828807	5.81538965	6.58027653	6.44729667	4.77328925
Capacitance Factor- πC	0.58	0.62	0.58	0.50	2.88	2.64	3.17	3.17	2.04	0.91	0.44	0.44	0.66	0.81	0.81
Voltage Stress Factor πV @115Vac	1.0021	1.0001	1.0000	1.0000	5.0494	1.1583	5.0494	11.5701	1.0264	1.1069	1.0000	1.0026	1.0016	1.1353	1.0871
Voltage Stress Factor πV @230Vac	1.0021	1.0001	1.0000	1.0000	5.0494	5.7677	5.0494	11.5701	1.0345	4.4137	1.0000	1.0028	1.0009	1.1301	1.0871
πSR	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Quality Factor- πQ	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Environ Factor- πE	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
λ_p @115Vac 25 °C	0.01930239	0.02150329	0.02590496	0.02546223	0.04677101	0.01486916	0.05816364	0.13956852	0.01039038	0.00648936	0.03177221	0.03197453	0.04656343	0.07076778	0.04842933
λ_p @115Vac 40 °C	0.03326042	0.03692114	0.04353013	0.04235399	0.08222501	0.0252249	0.10115197	0.2417580	0.01759402	0.00816663	0.05439557	0.05472447	0.07994937	0.12062043	0.0849656
λ_p @230Vac 25 °C	0.01945059	0.02207579	0.02391199	0.03763438	0.04788687	0.06259061	0.06137875	0.15118388	0.0102065	0.022350082	0.03461226	0.02954781	0.05109416	0.06940286	0.04805068
λ_p @230Vac 40 °C	0.03349401	0.03781902	0.04045258	0.0606327	0.08401388	0.1077114	0.10624905	0.26008616	0.01732029	0.02982047	0.05882834	0.05091454	0.08703275	0.11844366	0.08435894
Vp-p or Vo-p (V)@115Vac	19.1		89.4	166	50.0	166	50.0	50.0	14.5		0.504	4.13	3.500	15.4	13.3
Vp-p or Vo-p (V)@230Vac	19.3		86.3	294	50.0	328	50.0	50.0	15.3		0.758	4.25	2.940	15.2	13.3
Vrms (V)@115Vac		7.54								115.1					
Vrms (V)@230Vac		6.44								230.1					
Temperature(°C)@115Va	54.2	55.3	62.2	65.6	48.2	59.1	51.4	52.6	59.7	56.6	56.2	56.3	55.3	57.6	48.8
Temperature(°C)@230Va	54.4	56.0	60.0	77.0	48.8	54.6	52.8	54.7	59.0	50.7	58.5	54.2	57.8	57.2	48.6
Temperature Rise ΔT (°C)@115Vac	29.2	30.3	37.2	40.6	23.2	34.1	26.4	27.6	34.7	31.6	31.2	31.3	30.3	32.6	23.8
Temperature Rise ΔT (°C)@230Vac	29.4	31.0	35.0	52.0	23.8	29.6	27.8	29.7	34.0	25.7	33.5	29.2	32.8	32.2	23.6
Tc (°C)@115Vac 25 °C	54.2	55.3	62.2	65.6	48.2	59.1	51.4	52.6	59.7	56.6	56.2	56.3	55.3	57.6	48.8
Tc (°C)@115Vac 40 °C	69.2	70.3	77.2	80.6	63.2	74.1	66.4	67.6	74.7	71.6	71.2	71.3	70.3	72.6	63.8
Tc (°C)@230Vac 25 °C	54.4	56.0	60.0	77.0	48.8	54.6	52.8	54.7	59.0	50.7	58.5	54.2	57.8	57.2	48.6
Tc (°C)@230Vac 40 °C	69.4	71.0	75.0	92.0	63.8	69.6	67.8	69.7	74.0	65.7	73.5	69.2	72.8	72.2	63.6

$\Sigma \lambda_p$ @115Vac 25 °C 0.59793
 $\Sigma \lambda_p$ @115Vac 40 °C 1.02684

 $\Sigma \lambda_p$ @230Vac 25 °C 0.692528
 $\Sigma \lambda_p$ @230Vac 40 °C 1.177178

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Inductive Devices , Transformers							
Device :	Inductive Devices , Transformers : $\lambda p = \lambda b \times \pi T \times \pi Q \times \pi E$						
Product:	LTE36E-S5 48V/0.75A						
Room Temperature:	25 °C			Relative Humidity : 46%			
Parts Location	L01	L02	L04	T1			
Part description	T12x6x4	T16x10x7	0.7x12.5Ts	PQ-2620			
Part type	COMMON CHOKE	COMMON CHOKE	BAR CHOKE	TRANS.			
λb	0.00003	0.00003	0.00003	0.0054			
Temp. Factor- πT @115Vac 25 °C	1.4726315	1.5452967	1.3999618	1.5995318			
Temp. Factor- πT @115Vac 40 °C	1.7465770	1.8252581	1.6676451	1.8838327			
Temp. Factor- πT @230Vac 25 °C	1.3829260	1.4050926	1.4085183	1.6086577			
Temp. Factor- πT @230Vac 40 °C	1.6491038	1.6732265	1.6769522	1.8936767			
Quality Factor- πQ	3	3	3	3			
Environ.Factor- πE	1	1	1	1			
λp @115Vac 25 °C	0.000132537	0.000139077	0.000125997	0.025912415			
λp @115Vac 40 °C	0.000157192	0.000164273	0.000150088	0.03051809			
λp @230Vac 25 °C	0.000124463	0.000126458	0.000126767	0.026060254			
λp @230Vac 40 °C	0.000148419	0.00015059	0.000150926	0.030677562			
Measure Temperature(°C)@115Va	54.6	58.7	50.4	61.7			
Measure Temperature(°C)@230Va	49.4	50.7	50.9	62.2			
Temperature Rise△ T(°C)@115Vac	29.6	33.7	25.4	36.7			
Temperature Rise△ T(°C)@230Vac	24.4	25.7	25.9	37.2			
Tc(°C)@115Vac 25 °C	54.6	58.7	50.4	61.7			
Tc(°C)@115Vac 40 °C	69.6	73.7	65.4	76.7			
Tc(°C)@230Vac 25 °C	49.4	50.7	50.9	62.2			
Tc(°C)@230Vac 40 °C	64.4	65.7	65.9	77.2			

$\Sigma \lambda p$ @115Vac	25 °C	0.02631
$\Sigma \lambda p$ @115Vac	40 °C	0.03099
$\Sigma \lambda p$ @230Vac	25 °C	0.02644
$\Sigma \lambda p$ @230Vac	40 °C	0.03113

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	PCB						
Device :	$\lambda p = \lambda b \times \pi E$						
Product:	LTE36E-S5 48V/0.75A						
Room Temperature:	25 °C			Relative Humidity : 46%			
Parts Location	PCB						
λb	0.0013						
πE	1						
λP	0.0013						

$\Sigma \lambda p @115Vac$	25 °C	0.0013
$\Sigma \lambda p @115Vac$	40 °C	0.0013
$\Sigma \lambda p @230Vac$	25 °C	0.0013
$\Sigma \lambda p @230Vac$	40 °C	0.0013

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	Fuse						
Device :	$\lambda p = \lambda b \times \pi E$						
Product:	LTE36E-S5 48V/0.75A						
Room Temperature:	25 °C			Relative Humidity : 46%			
Parts Location	F01						
V	250						
I	4						
λb	0.01						
πE	1						
λP	0.01						

$\Sigma \lambda p @ 115Vac$	25 °C	0.01
$\Sigma \lambda p @ 115Vac$	40 °C	0.01
$\Sigma \lambda p @ 230Vac$	25 °C	0.01
$\Sigma \lambda p @ 230Vac$	40 °C	0.01