TAIWAN SEMICONDUCTOR

Phototransistor TPC817 Series
Lead Frame Change Notification

21.July.2021

Description of Change

Item	Current	New	Remarks
Wafer	A	A	Same
Leadframe	Fe (Yourun)	Cu Alloy (LuMai)	Different. See comparison
Die Attach	Epoxy (Yongoo)	Epoxy (Yongoo)	Same
White plastic	CV1400 (Panasonic)	CV1400 (Panasonic)	Same
Silica gel	Silicon (Wu Xing Wei)	Silicon (Wu Xing Wei)	Same
Wirebond	Gold wire (MK)	Gold wire (MK)	Same
Compound	TH-G220 (Beijing Sino-Tech)	TH-G220 (Beijing Sino-Tech)	Same
Plating	Sn 99.9 (Sinyang)	Sn 99.9 (Sinyang)	Same

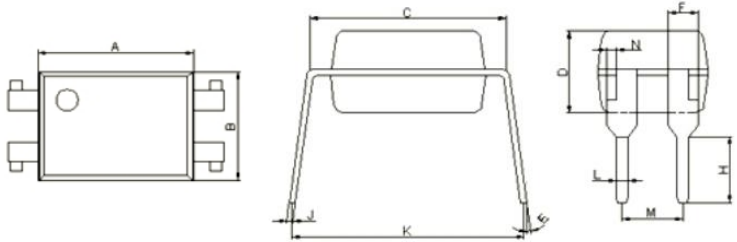
Part Number Coverage

Family	Package	TSC P/N
DC Input Phototransistor	DIP-4	TPC816A C9G
DC Input Phototransistor	DIP-4	TPC816B C9G
DC Input Phototransistor	DIP-4	TPC816C C9G
DC Input Phototransistor	DIP-4	TPC816D C9G
DC Input Phototransistor	DIP-4	TPC817A C9G
DC Input Phototransistor	DIP-4	TPC817B C9G
DC Input Phototransistor	DIP-4	TPC817C C9G
DC Input Phototransistor	DIP-4	TPC817D C9G
DC Input Phototransistor	DIP-4M	TPC816MA C9G
DC Input Phototransistor	DIP-4M	TPC816MB C9G
DC Input Phototransistor	DIP-4M	TPC816MC C9G
DC Input Phototransistor	DIP-4M	TPC816MD C9G
DC Input Phototransistor	DIP-4M	TPC817MA C9G
DC Input Phototransistor	DIP-4M	TPC817MB C9G
DC Input Phototransistor	DIP-4M	TPC817MC C9G
DC Input Phototransistor	DIP-4M	TPC817MD C9G
DC Input Phototransistor	SOP-4	TPC816S1A RAG
DC Input Phototransistor	SOP-4	TPC816S1B RAG
DC Input Phototransistor	SOP-4	TPC816S1C RAG
DC Input Phototransistor	SOP-4	TPC816S1D RAG
DC Input Phototransistor	SOP-4	TPC817S1A RAG
DC Input Phototransistor	SOP-4	TPC817S1B RAG
DC Input Phototransistor	SOP-4	TPC817S1C RAG
DC Input Phototransistor	SOP-4	TPC817S1D RAG

Lead Frame Material Comparison

	Before	After
MSDS		

Package Outline Comparison



	NO	A	B	C	D	E	F	H	J	K	L	M	N
Unit: mm	LLT	6.40	4.50	7.90	3.28	2°	1.15	2.70	0.20	8.86	0.40	2.44	0.30
	ULT	6.60	4.70	8.30	3.68	8°	1.35	2.90	0.30	9.31	0.60	2.64	0.50
Before	*MAX*	6.515	4.699	8.123	3.507	7°	1.286	2.770	0.290	9.254	0.542	2.533	0.395
	AVG	6.473	4.662	8.082	3.475	4.62°	1.278	2.740	0.282	9.120	0.533	2.517	0.385
	MIN	6.408	4.645	7.952	3.437	2°	1.255	2.720	0.269	8.972	0.522	2.458	0.374

	NO	A	B	C	D	E	F	H	J	K	L	M	N
Unit: mm	LLT	6.40	4.50	7.90	3.28	2°	1.15	2.70	0.20	8.86	0.40	2.44	0.30
	ULT	6.60	4.70	8.50	3.68	8°	1.35	2.90	0.30	9.31	0.60	2.64	0.50
After	*MAX*	6.571	4.677	8.427	3.500	6°	1.277	2.789	0.270	9.068	0.528	2.555	0.410
	AVG	6.559	4.674	8.415	3.484	4.667°	1.267	2.771	0.266	9.059	0.522	2.550	0.392
	MIN	6.521	4.671	8.401	3.437	3°	1.248	2.754	0.261	9.035	0.513	2.540	0.372

Conclusion:

With a minor change of “c”, which is non-critical item and won’t affect customer usage.

Product Electrical Test Performance Comparison

TPC817 Series	ITEM	VF(V)	IR(nA)	BVCEO	VCE(sat)	CTR(%)
	TEST Condition	IF=20mA	VR=4V	IC=0.1mA	IF=20mA, IC=1mA	VCE=5V, IF=5mA
	SPEC.	< 1.4	< 10000	> 80	< 0.2	< 600
Before	MAX	1.290	2.088	173.650	0.052	190.850
	MIN	1.250	0.698	156.030	0.038	159.140
	AVG.	1.254	0.960	168.759	0.046	174.189
	CPK	24.464	2.955	8.914	7.021	1.764
After	MAX	1.234	1.137	170.700	0.066	219.990
	MIN	1.222	0.525	150.820	0.050	186.030
	AVG.	1.226	0.818	164.452	0.056	209.248
	CPK	27.448	1.711	9.542	8.252	1.983

Conclusion:

The electrical performance after change is comparable.

Reliability Test Summary

No.	Test Item	Test Conditions	# Lots	Sample Size（pcs）	Result
1	PC	Temp. Cycle: -40 ° C ~ +60 ° C, 5 cycles Bake: 125 ° C for 24 hrs. MSL1: 85 ° C RH: 85 %, 168 Hrs IR Reflow Temperature: 260 (+5/-0)° C 3cycles	3	308	**Pass**
2	TC	-55(-10/+0)° C/15min to 150(+15/-0)° C/15min 1000cycles	1	77	**Pass**
3	AC or UHAST	Ta=121℃/100%RH, +15psig 96hrs Ta = 130 ° C, 85 % RH 96hrs	1	77	**Pass**
4	RSH	Pb free: 260° C 10sec	1	5	**Pass**
5	SD	245 ° C ± 5 ° C (Pb-free) 5sec	1	5	**Pass**

Conclusion:
Without failure.

End

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