

Kapton® labels

Tyco Electronics polyimide (Kapton®) labels are all ideal for high temperature labeling requirements such as printed circuit boards. They are suitable for direct wave (bottom side) and IR reflow (top side) PCB applications. Tyco Electronics Kapton® labels are designed to withstand the fluxes, cleaning solvents and molten solder encountered in the manufacture of printed circuit boards. They offer excellent contrast for bar code applications. Tyco Electronics Kapton® labels are suitable for the harshest high temperature applications. For reliable print performance and durability, use with Tyco Electronics's 1330-0619 ribbon.

Features and benefits

- UL Listed: T1K and T2K
- Thermal transfer printable
- High temperature permanent acrylic adhesive

T1K

- Gloss white topcoat
- Withstands surface mount board processes on either the top or bottom side of the board
- Low profile 1 mil film offers polyimide thermal performance at competitive cost
- Ideal for manual apply applications

T2K

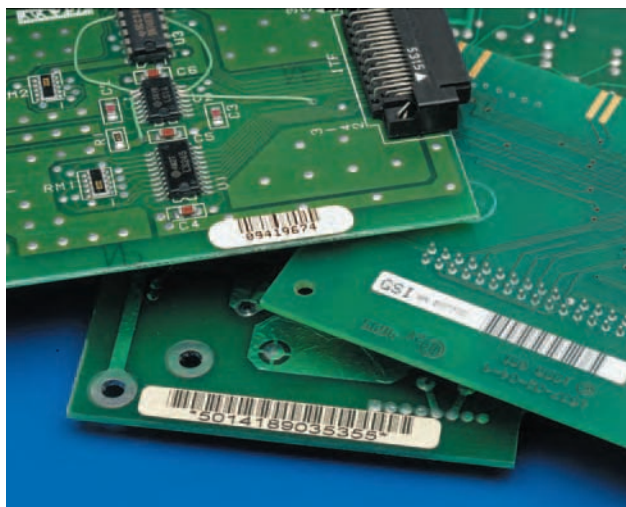
- Gloss white topcoat
- Withstands surface mount board processes on either the top or bottom side of the board
- Ideal for auto apply applications

KTT

- Matte tan topcoat
- Withstands surface mount board processes on either the top or bottom side of the board
- Product approved for aerospace/defense applications.
- Low outgassing

TSK

- High opacity gloss white topcoat
- Withstands surface mount board processes on either the top or bottom side of the board
- Deemed to be a static safe product in accordance with EIA 625, EIA 541. Test methods employed were in accordance with EOS/ESD S11.11
- Ideal for auto apply applications



Specifications/Approvals

Tyco Electronics		T1K	TTDS-034
		T2K	TTDS-035
		TSK	TTDS-085
Industry	UL	T1K	MH17292 Group PGJ12
		T2K	MH17292 Group PGJ12

Adhesive

Permanent acrylic

Service temperature

T1K ¹ , T2K ² ,	-40°C to +260°C	-40°F to +500°F
TSK ² , KTT ²		

¹ Flash exposure to +472°C (+800°F)

² Flash exposure to +538°C (+1000°F)

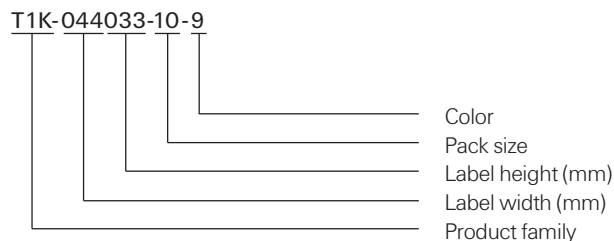
Recommended printer

T1K, T2K, TSK, T2Y	T312S*
KTT	

Recommended ribbon

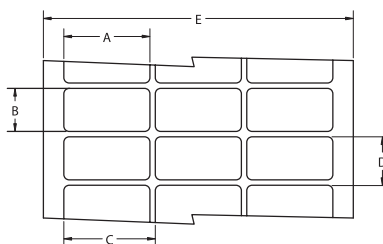
1330-0619-10*
* Alternative printers and ribbons are available for special applications. Contact Tyco Electronics Identification for more information.

Part numbering system



T1K White Kapton® labels

Ordering information



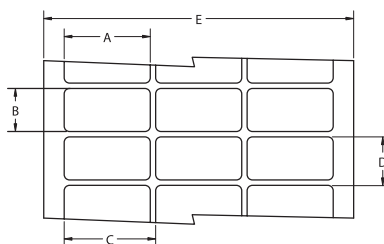
Product dimensions

Product order code	Package quantity	Labels across	Label width (A) mm <i>inches</i>	Label height (B) mm <i>inches</i>	Horizontal repeat (C) mm <i>inches</i>	Vertical repeat (D) mm <i>inches</i>	Web width (E) mm <i>inches</i>
T1K-044033-10-9	10,000	20	4.4 <i>0.170</i>	3.3 <i>0.130</i>	4.4 <i>0.170</i>	9.5 <i>0.375</i>	92.4 <i>3.636</i>
T1K-064064-25-9	25,000	12	6.4 <i>0.250</i>	6.4 <i>0.250</i>	6.4 <i>0.250</i>	9.5 <i>0.375</i>	82.2 <i>3.240</i>
*T1K-080080-10-9	10,000	8	8.0 <i>0.315</i>	8.0 <i>0.315</i>	9.9 <i>0.390</i>	13.3 <i>0.525</i>	83.3 <i>3.280</i>
T1K-095080-25-9	25,000	5	9.5 <i>0.375</i>	8.0 <i>0.315</i>	12.2 <i>0.480</i>	12.7 <i>0.500</i>	64.3 <i>2.531</i>
T1K-095095-10-9	10,000	7	9.5 <i>0.375</i>	9.5 <i>0.375</i>	11.1 <i>0.437</i>	12.7 <i>0.500</i>	82.1 <i>3.230</i>
T1K-127032-10-9	10,000	5	12.7 <i>0.500</i>	3.2 <i>0.125</i>	19.1 <i>0.750</i>	3.2 <i>0.250</i>	94.9 <i>3.736</i>
T1K-127111-10-9	10,000	5	12.7 <i>0.500</i>	11.1 <i>0.437</i>	16.8 <i>0.662</i>	14.3 <i>0.563</i>	86.0 <i>3.380</i>
T1K-127127-10-9	10,000	5	12.7 <i>0.500</i>	12.7 <i>0.500</i>	15.9 <i>0.625</i>	15.9 <i>0.625</i>	82.6 <i>3.250</i>
*T1K-165051-25-9	25,000	4	16.5 <i>0.650</i>	5.1 <i>0.200</i>	17.8 <i>0.700</i>	8.3 <i>0.325</i>	75.8 <i>2.990</i>
T1K-171171-10-9	10,000	5	17.1 <i>0.674</i>	17.1 <i>0.674</i>	19.7 <i>0.774</i>	20.3 <i>0.800</i>	101.8 <i>4.006</i>
*T1K-178095-10-9	10,000	4	17.8 <i>0.700</i>	9.5 <i>0.375</i>	19.1 <i>0.750</i>	12.7 <i>0.500</i>	80.9 <i>3.190</i>
*T1K-191064-10-9	10,000	4	19.1 <i>0.750</i>	6.4 <i>0.250</i>	21.6 <i>0.850</i>	9.5 <i>0.375</i>	89.9 <i>3.540</i>
T1K-229064-10-9	10,000	3	22.9 <i>0.900</i>	6.4 <i>0.250</i>	28.6 <i>1.125</i>	9.5 <i>0.375</i>	86.0 <i>3.390</i>
T1K-254045-10-9	10,000	3	25.4 <i>1.000</i>	4.6 <i>0.180</i>	31.8 <i>1.250</i>	8.5 <i>0.333</i>	95.3 <i>3.750</i>
T1K-254064-10-9	10,000	3	25.4 <i>1.000</i>	6.4 <i>0.250</i>	27.9 <i>1.100</i>	9.5 <i>0.375</i>	87.3 <i>3.436</i>
T1K-254097-10-9	10,000	3	25.4 <i>1.000</i>	9.7 <i>0.380</i>	27.9 <i>1.100</i>	12.7 <i>0.500</i>	87.4 <i>3.440</i>
T1K-254127-10-9	10,000	3	25.4 <i>1.000</i>	12.7 <i>0.500</i>	27.9 <i>1.100</i>	16.9 <i>0.666</i>	87.4 <i>3.440</i>
T1K-254254-10-9	10,000	3	25.4 <i>1.000</i>	25.4 <i>1.000</i>	27.9 <i>1.100</i>	28.6 <i>1.125</i>	87.4 <i>3.440</i>
*T1K-305047-10-9	10,000	2	30.5 <i>1.200</i>	4.7 <i>0.185</i>	33.0 <i>1.300</i>	7.8 <i>0.306</i>	69.5 <i>2.736</i>
T1K-318064-10-9	10,000	1	31.8 <i>1.250</i>	6.4 <i>0.250</i>	N/A N/A	9.5 <i>0.375</i>	37.9 <i>1.490</i>
T1K-381020-10-9	10,000	1	38.1 <i>1.500</i>	2.0 <i>0.080</i>	N/A N/A	10.7 <i>0.423</i>	44.1 <i>1.740</i>
*T1K-381127-5-9	5,000	2	38.1 <i>1.500</i>	12.7 <i>0.500</i>	44.2 <i>1.738</i>	15.9 <i>0.625</i>	88.2 <i>3.472</i>
T1K-381381-2-5-9	2,500	2	38.1 <i>1.500</i>	38.1 <i>1.500</i>	44.5 <i>1.750</i>	40.8 <i>1.607</i>	88.9 <i>3.500</i>
T1K-445064-10-9	10,000	1	44.5 <i>1.750</i>	6.4 <i>0.250</i>	N/A N/A	9.5 <i>0.375</i>	50.4 <i>1.986</i>
T1K-445102-5-9	5,000	1	44.5 <i>1.750</i>	10.2 <i>0.400</i>	N/A N/A	12.7 <i>0.500</i>	50.4 <i>1.386</i>
T1K-508064-10-9	10,000	1	50.8 <i>2.000</i>	6.4 <i>0.250</i>	N/A N/A	9.5 <i>0.375</i>	56.9 <i>2.240</i>
T1K-508095-5-9	5,000	1	50.8 <i>2.000</i>	9.5 <i>0.375</i>	N/A N/A	12.7 <i>0.500</i>	57.2 <i>2.250</i>
T1K-508127-5-9	5,000	1	50.8 <i>2.000</i>	12.7 <i>0.500</i>	N/A N/A	15.9 <i>0.625</i>	56.9 <i>2.240</i>

* NOTE: Kapton®/polyimide labels not compatible with T200 Printers

T2K White Kapton® labels

Ordering information



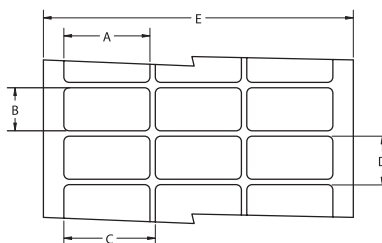
Product dimensions

Product order code	Package quantity	Labels across	Label width (A) mm <i>inches</i>	Label height (B) mm <i>inches</i>	Horizontal repeat (C) mm <i>inches</i>	Vertical repeat (D) mm <i>inches</i>	Web width (E) mm <i>inches</i>
T2K-044033-10-9	10,000	20	4.4 <i>0.170</i>	3.3 <i>0.130</i>	4.4 <i>0.170</i>	9.5 <i>0.375</i>	92.4 <i>3.636</i>
T2K-064064-25-9	25,000	12	6.4 <i>0.250</i>	6.4 <i>0.250</i>	6.4 <i>0.250</i>	9.5 <i>0.375</i>	82.2 <i>3.240</i>
*T2K-080080-10-9	10,000	8	8.0 <i>0.315</i>	8.0 <i>0.315</i>	9.9 <i>0.390</i>	13.3 <i>0.525</i>	83.3 <i>3.280</i>
T2K-095080-25-9	25,000	5	9.5 <i>0.375</i>	8.0 <i>0.315</i>	12.2 <i>0.480</i>	12.7 <i>0.500</i>	64.3 <i>2.531</i>
T2K-095095-10-9	10,000	7	9.5 <i>0.375</i>	9.5 <i>0.375</i>	11.1 <i>0.437</i>	12.7 <i>0.500</i>	82.1 <i>3.230</i>
T2K-127032-10-9	10,000	5	12.7 <i>0.500</i>	3.2 <i>0.125</i>	19.1 <i>0.750</i>	3.2 <i>0.250</i>	94.9 <i>3.736</i>
T2K-127111-10-9	10,000	5	12.7 <i>0.500</i>	11.1 <i>0.437</i>	16.8 <i>0.662</i>	14.3 <i>0.563</i>	86.0 <i>3.380</i>
T2K-127127-10-9	10,000	5	12.7 <i>0.500</i>	12.7 <i>0.500</i>	15.9 <i>0.625</i>	15.9 <i>0.625</i>	82.6 <i>3.250</i>
*T2K-165051-25-9	25,000	4	16.5 <i>0.650</i>	5.1 <i>0.200</i>	17.8 <i>0.700</i>	8.3 <i>0.325</i>	75.8 <i>2.990</i>
T2K-171171-10-9	10,000	5	17.1 <i>0.674</i>	17.1 <i>0.674</i>	19.7 <i>0.774</i>	20.3 <i>0.800</i>	101.8 <i>4.006</i>
*T2K-178095-10-9	10,000	4	17.8 <i>0.700</i>	9.5 <i>0.375</i>	19.1 <i>0.750</i>	12.7 <i>0.500</i>	80.9 <i>3.190</i>
*T2K-191064-10-9	10,000	4	19.1 <i>0.750</i>	6.4 <i>0.250</i>	21.6 <i>0.850</i>	9.5 <i>0.375</i>	89.9 <i>3.540</i>
T2K-229064-10-9	10,000	3	22.9 <i>0.900</i>	6.4 <i>0.250</i>	28.6 <i>1.125</i>	9.5 <i>0.375</i>	86.0 <i>3.390</i>
T2K-254045-10-9	10,000	3	25.4 <i>1.000</i>	4.6 <i>0.180</i>	31.8 <i>1.250</i>	8.5 <i>0.333</i>	95.3 <i>3.750</i>
T2K-254064-10-9	10,000	3	25.4 <i>1.000</i>	6.4 <i>0.250</i>	27.9 <i>1.100</i>	9.5 <i>0.375</i>	87.3 <i>3.436</i>
T2K-254097-10-9	10,000	3	25.4 <i>1.000</i>	9.7 <i>0.380</i>	27.9 <i>1.100</i>	12.7 <i>0.500</i>	87.4 <i>3.440</i>
T2K-254127-10-9	10,000	3	25.4 <i>1.000</i>	12.7 <i>0.500</i>	27.9 <i>1.100</i>	16.9 <i>0.666</i>	87.4 <i>3.440</i>
T2K-254254-10-9	10,000	3	25.4 <i>1.000</i>	25.4 <i>1.000</i>	27.9 <i>1.100</i>	28.6 <i>1.125</i>	87.4 <i>3.440</i>
*T2K-305047-10-9	10,000	2	30.5 <i>1.200</i>	4.7 <i>0.185</i>	33.0 <i>1.300</i>	7.8 <i>0.306</i>	69.5 <i>2.736</i>
T2K-318064-10-9	10,000	1	31.8 <i>1.250</i>	6.4 <i>0.250</i>	N/A N/A	9.5 <i>0.375</i>	37.9 <i>1.490</i>
T2K-381020-10-9	10,000	1	38.1 <i>1.500</i>	2.0 <i>0.080</i>	N/A N/A	10.7 <i>0.423</i>	44.1 <i>1.740</i>
T2K-381064-10-9	10,000	1	38.1 <i>1.500</i>	6.4 <i>0.250</i>	N/A N/A	9.5 <i>0.375</i>	44.5 <i>1.750</i>
*T2K-381127-5-9	5,000	2	38.1 <i>1.500</i>	12.7 <i>0.500</i>	44.2 <i>1.738</i>	15.9 <i>0.625</i>	88.2 <i>3.472</i>
T2K-381381-2-5-9	2,500	2	38.1 <i>1.500</i>	38.1 <i>1.500</i>	44.5 <i>1.750</i>	40.8 <i>1.607</i>	88.9 <i>3.500</i>
T2K-445064-10-9	10,000	1	44.5 <i>1.750</i>	6.4 <i>0.250</i>	N/A N/A	9.5 <i>0.375</i>	50.4 <i>1.986</i>
T2K-445102-5-9	5,000	1	44.5 <i>1.750</i>	10.2 <i>0.400</i>	N/A N/A	12.7 <i>0.500</i>	50.4 <i>1.386</i>
T2K-508064-10-9	10,000	1	50.8 <i>2.000</i>	6.4 <i>0.250</i>	N/A N/A	9.5 <i>0.375</i>	56.9 <i>2.240</i>
T2K-508091-5-9	5,000	1	50.8 <i>2.000</i>	9.1 <i>0.358</i>	N/A N/A	12.2 <i>0.480</i>	57.2 <i>2.250</i>
T2K-508095-5-9	5,000	1	50.8 <i>2.000</i>	9.5 <i>0.375</i>	N/A N/A	12.7 <i>0.500</i>	57.2 <i>2.250</i>
T2K-508127-5-9	5,000	1	50.8 <i>2.000</i>	12.7 <i>0.500</i>	N/A N/A	15.9 <i>0.625</i>	56.9 <i>2.240</i>

* NOTE: Kapton®/polyimide labels not compatible with T200 Printers

TSK White polyimide labels

Ordering information



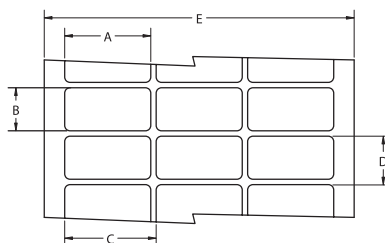
Product dimensions

Product order code	Package quantity	Labels across	Label width (A) mm inches	Label height (B) mm inches	Horizontal repeat (C) mm inches	Vertical repeat (D) mm inches	Web width (E) mm inches
TSK-044033-10-9	10,000	20	4.4 0.170	3.3 0.130	4.4 0.170	9.5 0.375	92.4 3.636
TSK-064064-25-9	25,000	12	6.4 0.250	6.4 0.250	6.4 0.250	9.5 0.375	82.2 3.240
*TSK-080080-10-9	10,000	8	8.0 0.315	8.0 0.315	9.9 0.390	13.3 0.525	83.3 3.280
TSK-095080-25-9	25,000	5	9.5 0.375	8.0 0.315	12.2 0.480	12.7 0.500	64.3 2.531
TSK-095095-10-9	10,000	7	9.5 0.375	9.5 0.375	11.1 0.437	12.7 0.500	82.1 3.230
TSK-127032-10-9	10,000	5	12.7 0.500	3.2 0.125	19.1 0.750	3.2 0.250	94.9 3.736
TSK-127111-10-9	10,000	5	12.7 0.500	11.1 0.437	16.8 0.662	14.3 0.563	86.0 3.380
TSK-127127-10-9	10,000	5	12.7 0.500	12.7 0.500	15.9 0.625	15.9 0.625	82.6 3.250
TSK-165051-25-9	25,000	4	16.5 0.650	5.1 0.200	17.8 0.700	8.3 0.325	75.8 2.990
TSK-171171-10-9	10,000	5	17.1 0.674	17.1 0.674	19.7 0.774	20.3 0.800	101.8 4.006
TSK-178095-10-9	10,000	4	17.8 0.700	9.5 0.375	19.1 0.750	12.7 0.500	80.9 3.190
*TSK-191064-10-9	10,000	4	19.1 0.750	6.4 0.250	21.6 0.850	9.5 0.375	89.9 3.540
TSK-229064-10-9	10,000	3	22.9 0.900	6.4 0.250	28.6 1.125	9.5 0.375	86.0 3.390
TSK-254045-10-9	10,000	3	25.4 1.000	4.6 0.180	31.8 1.250	8.5 0.333	95.3 3.750
TSK-254064-10-9	10,000	3	25.4 1.000	6.4 0.250	27.9 1.100	9.5 0.375	87.3 3.436
TSK-254097-10-9	10,000	3	25.4 1.000	9.7 0.380	27.9 1.100	12.7 0.500	87.4 3.440
TSK-254127-10-9	10,000	3	25.4 1.000	12.7 0.500	27.9 1.100	16.9 0.666	87.4 3.440
TSK-254254-10-9	10,000	3	25.4 1.000	25.4 1.000	27.9 1.100	28.6 1.125	87.4 3.440
*TSK-305047-10-9	10,000	2	30.5 1.200	4.7 0.185	33.0 1.300	7.8 0.306	69.5 2.736
TSK-318064-10-9	10,000	1	31.8 1.250	6.4 0.250	N/A N/A	9.5 0.375	37.9 1.490
TSK-381020-10-9	10,000	1	38.1 1.500	2.0 0.080	N/A N/A	10.7 0.423	44.1 1.740
TSK-381064-10-9	10,000	1	38.1 1.500	6.4 0.250	N/A N/A	9.5 0.375	44.5 1.750
*TSK-381127-5-9	5,000	2	38.1 1.500	12.7 0.500	44.2 1.738	15.9 0.625	88.2 3.472
TSK-381381-2-5-9	2,500	2	38.1 1.500	38.1 1.500	44.5 1.750	40.8 1.607	88.9 3.500
TSK-445064-10-9	10,000	1	44.5 1.750	6.4 0.250	N/A N/A	9.5 0.375	50.4 1.986
TSK-445102-5-9	5,000	1	44.5 1.750	10.2 0.400	N/A N/A	12.7 0.500	50.4 1.386
TSK-508064-10-9	10,000	1	50.8 2.000	9.5 0.375	N/A N/A	12.7 0.500	57.2 2.250
TSK-508095-10-9	5,000	1	50.8 2.000	12.7 0.500	N/A N/A	15.9 0.625	56.9 2.240
TSK-508127-5-9	5,000	1	50.8 2.000	12.7 0.500	N/A N/A	15.9 0.625	56.9 2.240

* NOTE: Kapton®/polyimide labels not compatible with T200 Printers

KTT Tan Kapton® labels

Ordering information



Product dimensions

Product order code	Package quantity	Labels across	Label width (A) mm <i>inches</i>	Label height (B) mm <i>inches</i>	Horizontal repeat (C) mm <i>inches</i>	Vertical repeat (D) mm <i>inches</i>	Web width (E) mm <i>inches</i>
KTT-044033-10-1A	10,000	20	4.4 <i>0.170</i>	3.3 <i>0.130</i>	4.4 0.170	9.5 0.375	92.4 3.636
KTT-064064-25-1A	25,000	12	6.4 <i>0.250</i>	6.4 <i>0.250</i>	6.4 0.250	9.5 0.375	82.2 3.240
*KTT-080080-10-1A	10,000	8	8.0 <i>0.315</i>	8.0 <i>0.315</i>	9.9 0.390	13.3 0.525	83.3 3.280
KTT-095080-25-1A	25,000	5	9.5 <i>0.375</i>	8.0 <i>0.315</i>	12.2 0.480	12.7 0.500	64.3 2.531
KTT-095095-10-1A	10,000	7	9.5 <i>0.375</i>	9.5 <i>0.375</i>	11.1 0.437	12.7 0.500	82.1 3.230
KTT-127032-10-1A	10,000	5	12.7 <i>0.500</i>	3.2 <i>0.125</i>	19.1 0.750	3.2 0.250	94.9 3.736
KTT-127111-10-1A	10,000	5	12.7 <i>0.500</i>	11.1 <i>0.437</i>	16.8 0.662	14.3 0.563	86.0 3.380
KTT-127127-10-1A	10,000	5	12.7 <i>0.500</i>	12.7 <i>0.500</i>	15.9 0.625	15.9 0.625	82.6 3.250
*KTT-165051-25-1A	25,000	4	16.5 <i>0.650</i>	5.1 <i>0.200</i>	17.8 0.700	8.3 0.325	75.8 2.990
KTT-171171-10-1A	10,000	5	17.1 <i>0.674</i>	17.1 <i>0.674</i>	19.7 0.774	20.3 0.800	101.8 4.006
*KTT-178095-10-1A	10,000	4	17.8 <i>0.700</i>	9.5 <i>0.375</i>	19.1 0.750	12.7 0.500	80.9 3.190
*KTT-191064-10-1A	10,000	4	19.1 <i>0.750</i>	6.4 <i>0.250</i>	21.6 0.850	9.5 0.375	89.9 3.540
KTT-229064-10-1A	10,000	3	22.9 <i>0.900</i>	6.4 <i>0.250</i>	28.6 1.125	9.5 0.375	86.0 3.390
KTT-254045-10-1A	10,000	3	25.4 <i>1.000</i>	4.6 <i>0.180</i>	31.8 1.250	8.5 0.333	95.3 3.750
KTT-254064-10-1A	10,000	3	25.4 <i>1.000</i>	6.4 <i>0.250</i>	27.9 1.100	9.5 0.375	87.3 3.436
KTT-254097-10-1A	10,000	3	25.4 <i>1.000</i>	9.7 <i>0.380</i>	27.9 1.100	12.7 0.500	87.4 3.440
KTT-254127-10-1A	10,000	3	25.4 <i>1.000</i>	12.7 <i>0.500</i>	27.9 1.100	16.9 0.666	87.4 3.440
KTT-254254-10-1A	10,000	3	25.4 <i>1.000</i>	25.4 <i>1.000</i>	27.9 1.100	28.6 1.125	87.4 3.440
*KTT-305047-10-1A	10,000	2	30.5 <i>1.200</i>	4.7 <i>0.185</i>	33.0 1.300	7.8 0.306	69.5 2.736
KTT-318064-10-1A	10,000	1	31.8 <i>1.250</i>	6.4 <i>0.250</i>	N/A N/A	9.5 0.375	37.9 1.490
KTT-381020-10-1A	10,000	1	38.1 <i>1.500</i>	2.0 <i>0.080</i>	N/A N/A	10.7 0.423	44.1 1.740
KTT-381064-10-1A	10,000	1	38.1 <i>1.500</i>	6.4 <i>0.250</i>	N/A N/A	9.5 0.375	44.5 1.750
*KTT-381127-5-1A	5,000	2	38.1 <i>1.500</i>	12.7 <i>0.500</i>	44.2 1.738	15.9 0.625	88.2 3.472
KTT-381381-2-5-1A	2,500	2	38.1 <i>1.500</i>	38.1 <i>1.500</i>	44.5 1.750	40.8 1.607	88.9 3.500
KTT-445064-10-1A	10,000	1	44.5 <i>1.750</i>	6.4 <i>0.250</i>	N/A N/A	9.5 0.375	50.4 1.986
KTT-445102-5-1A	5,000	1	44.5 <i>1.750</i>	10.2 <i>0.400</i>	N/A N/A	12.7 0.500	50.4 1.986
KTT-508064-10-1A	10,000	1	50.8 <i>2.000</i>	6.4 <i>0.250</i>	N/A N/A	9.5 0.375	56.9 2.240
KTT-508095-5-1A	5,000	1	50.8 <i>2.000</i>	9.5 <i>0.375</i>	N/A N/A	12.7 0.500	57.2 2.250
KTT-508127-5-1A	5,000	1	50.8 <i>2.000</i>	12.7 <i>0.500</i>	N/A N/A	15.9 0.625	56.9 2.240

* NOTE: Kapton®/polyimide labels not compatible with T200 Printers