

Features

- High accuracy: $\pm 2\%$ (25°C)
- Low power consumption: 0.6μA @ 3V V_{CC}
- Detecting voltage range: 1.8 to 5V in 100mV increments
- Operating voltage range: 1.2V ~ 5.5V
- Operating temperature range: -40°C to + 85°C
- Detecting voltage accuracy over temperature: $\pm 2.5\% \times \text{TYP}$
- Output configuration: N-channel open drain or CMOS
- Reset timeout period at least 120ms

Description

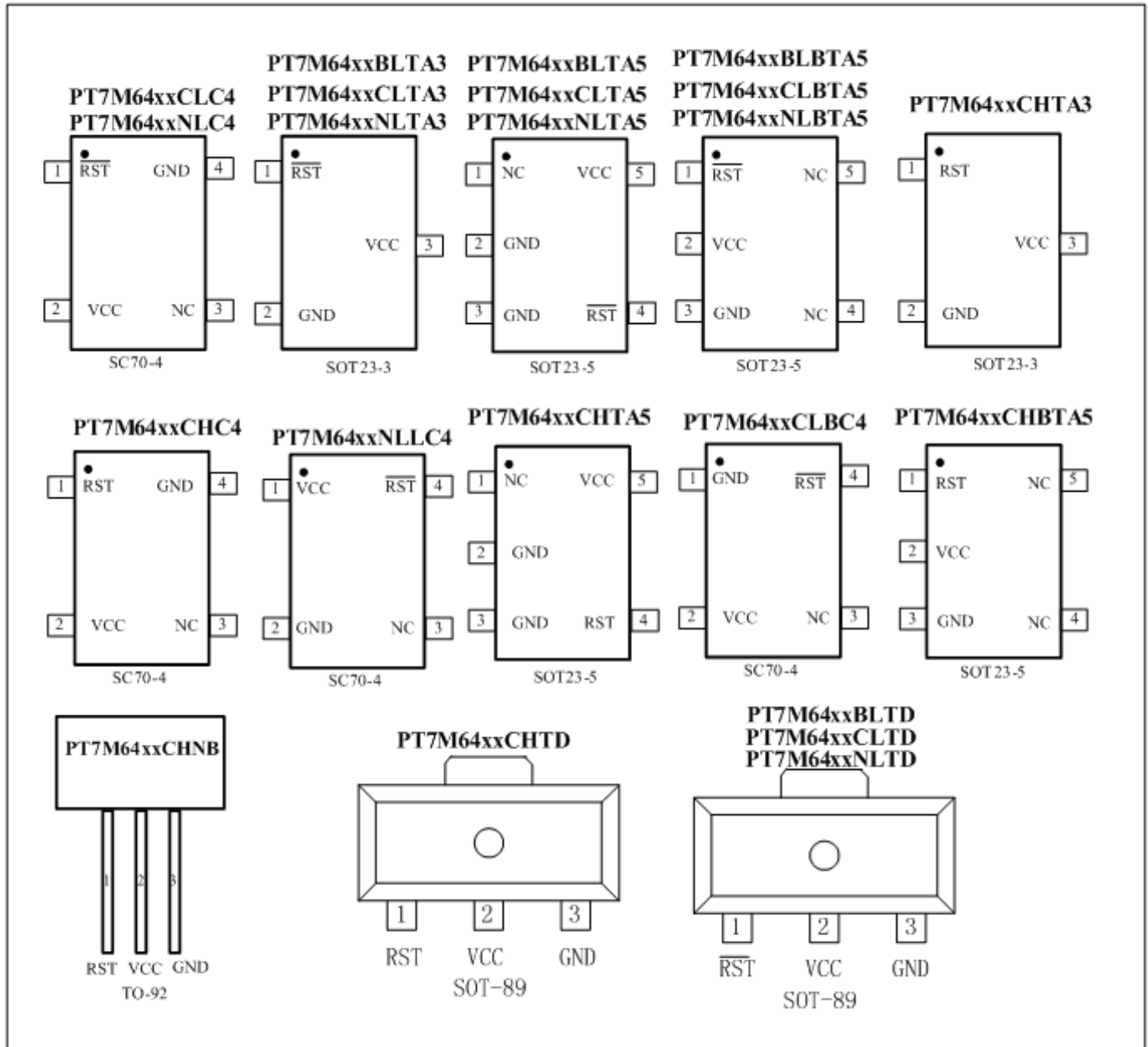
The PT7M64xx series are μP supervisory circuits with a minimum reset timeout period of 120ms. Each circuit includes a precise bandgap reference; a comparator, a reset timeout circuit, internally trimmed resistor networks that set specified trip thresholds, and an internal 5% threshold hysteresis circuit (see the Block Diagram). Output is asserted when V_{CC} falls below the internal V_{TH-} and remains asserted until V_{CC} rises above V_{TH+} ($V_{TH+} = V_{TH-} \times 1.05$) after a reset timeout period. These devices provide excellent circuit reliability and low cost by eliminating external components and adjustments when monitoring normal systems voltage from +1.8V to +5V in 100mV increments. The series are voltage detectors with a propagation delay of 35μs.

The family is available with four output stage options: push-pull with active-low output, push-pull with active-high output, open drain with active-low output and bidirection port with active-low output and pushbutton reset input. These devices specified over the -40°C to +85°C temperature range.

Table 1. Function comparison

Item	Part No.	Reset Output				Reset bi-direction	Threshold
		Open-Drain		Push-Pull			
		Active high	Active low	Active high	Active low		
1	PT7M64xxCL	-	-	-	√	-	1.8V to 5.0V in 100mV increments
2	PT7M64xxCH	-	-	√	-	-	
3	PT7M64xxNL	-	√	-	-	-	
4	PT7M64xxNLL	-	√	-	-	-	
5	PT7M64xxBL	-	-	-	-	√	

Pin Configuration

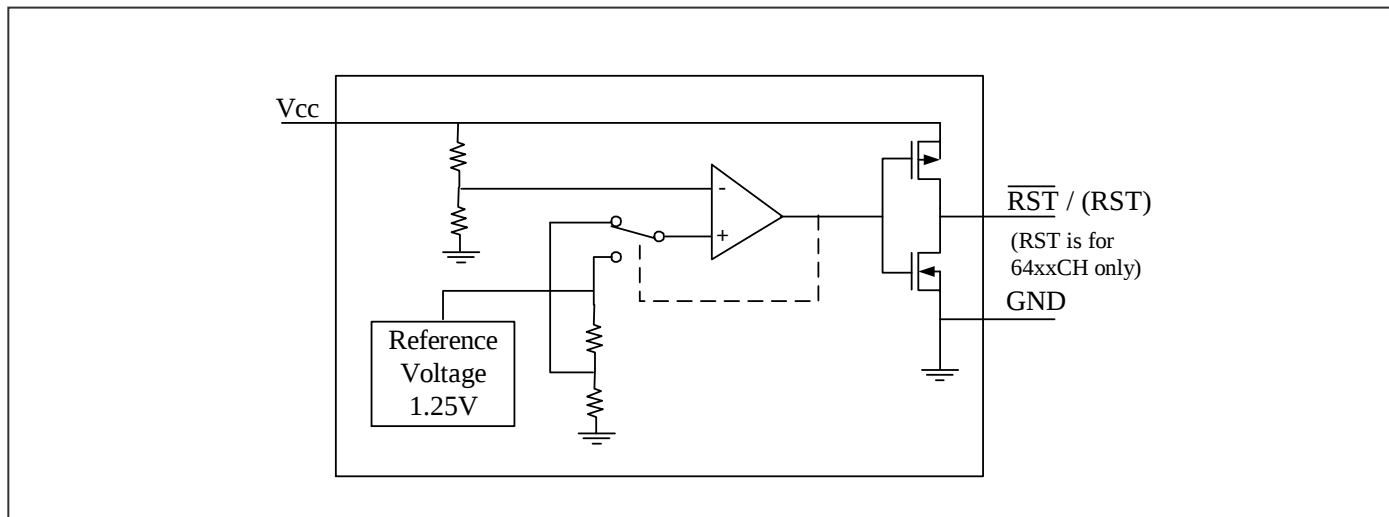


Pin Description

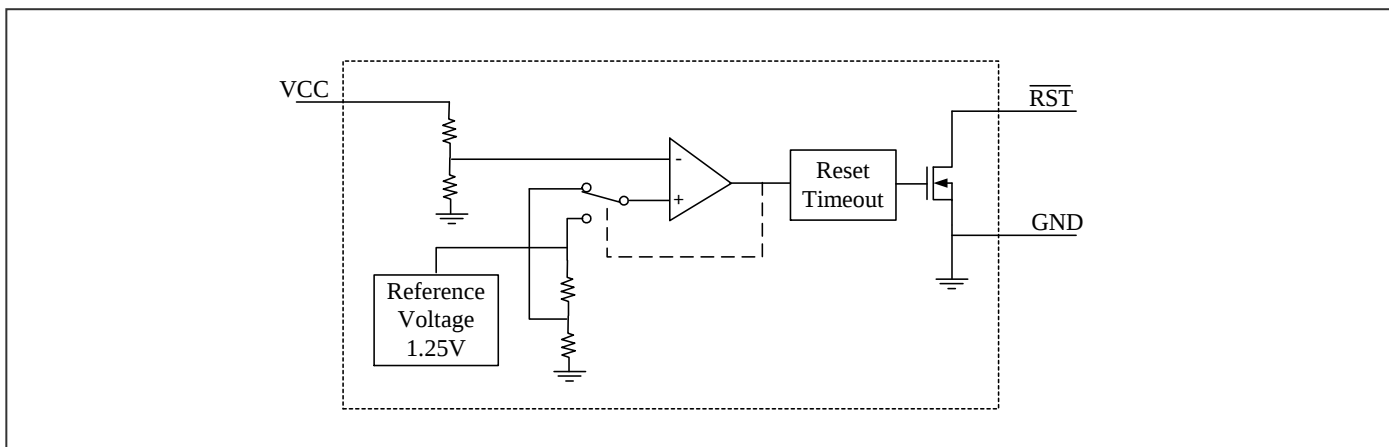
Name	Type	Description
$\overline{\text{RST}}$	O	Reset Output (PT7M64xxCL/NL/BL/NLL): $\overline{\text{RST}}$ is asserted when V_{CC} drops below voltage threshold V_{TH} : Active low. For PT7M64xxBL, $\overline{\text{RST}}$ is also pushbutton reset input
RST	O	Reset Output (PT7M64xxCH): RST is asserted when V_{CC} drops below voltage threshold V_{TH} : Active high.
GND	P	Ground
V_{CC}	P	Supply Voltage

Block Diagram

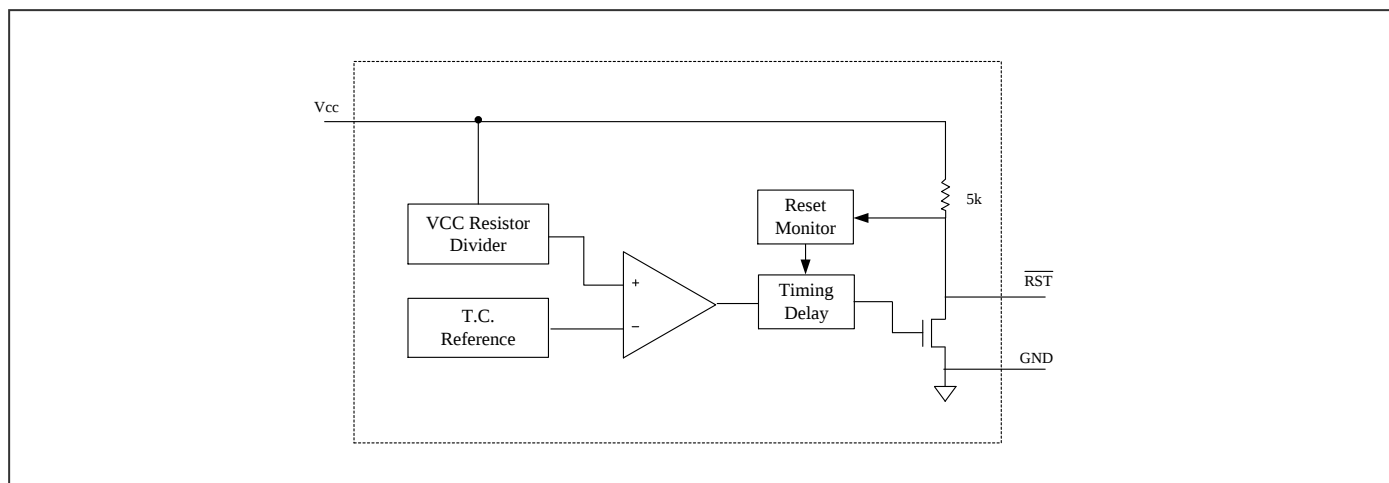
Block Diagram of PT7M64xxCL/CH



Block Diagram of PT7M64xxNL/NLL



Block Diagram of PT7M64xxBL



Maximum Ratings

Storage Temperature	-65°C to +150°C
Ambient Temperature with Power Applied	-40°C to +85°C
Supply Voltage to Ground Potential (V _{CC} to GND)	-0.3V to +6.0V
DC Input Voltage (All inputs except V _{CC} and GND)	-0.3V to V _{CC} +0.3V
DC Output Current (All outputs)	20mA
ESD(HBM) for 64xxNL/NLL	1KV
ESD(HBM) for 64xxCL/CH/BL	2KV
Power Dissipation	320mW
(Depend on package)	

Note:

Stresses greater than those listed under MAXIMUM RATINGS may cause permanent damage to the device. This is a stress rating only and functional operation of the device at these or any other conditions above those indicated in the operational sections of this specification is not implied. Exposure to absolute maximum rating conditions for extended periods may affect reliability.

DC Electrical Characteristics

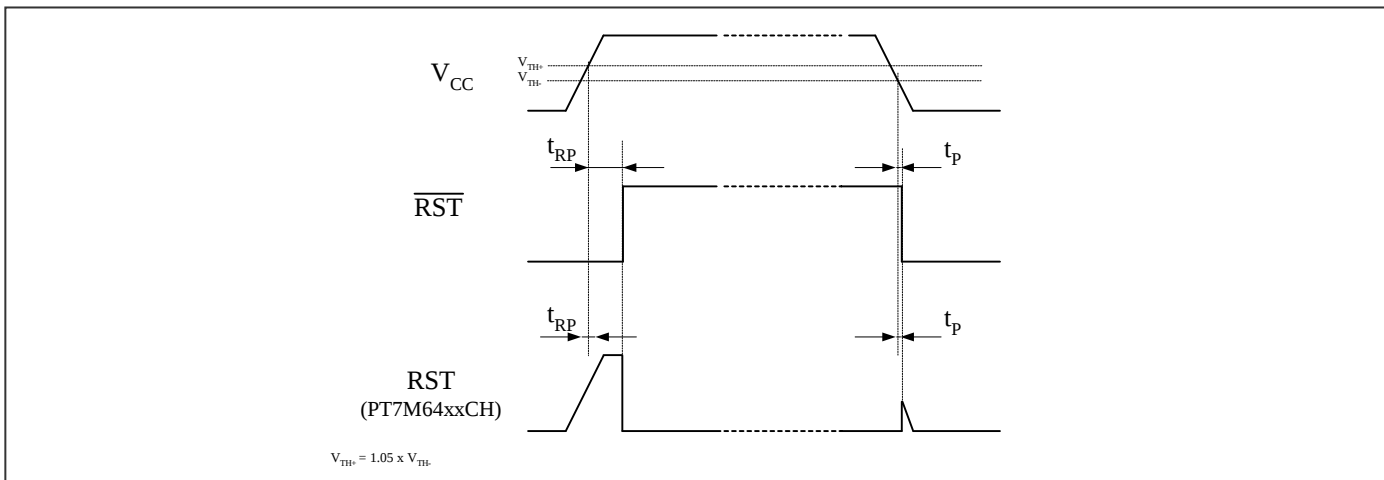
(V_{CC} = 1.2V to 5.5V, T_A = -40~85°C, unless otherwise noted. Typical values are at T_A = +25°C)

Description		Sym	Test Conditions	Min	Typ	Max	Unit
Supply Voltage		V _{CC}	T _A = 0~70°C	1.0	-	5.5	V
			T _A = -40~85°C	1.2	-	5.5	
Supply Current		I _{CC}	V _{CC} = 3V. No load.	-	0.6	1.2	μA
			V _{CC} = 5V. No load.	-	0.9	2.0	μA
Output Driving	Output high (Push-Pull only)	V _{OH}	V _{CC} ≥ 1.8V, I _{source} = 1mA	0.8×V _{CC}	-	-	V
			V _{CC} ≥ 2.5V, I _{source} = 3mA	0.8×V _{CC}	-	-	
			V _{CC} ≥ 4.5V, I _{source} = 8mA	0.8×V _{CC}	-	-	
	Output low	V _{OL}	V _{CC} ≥ 1.2V, I _{sink} = 1mA	-	-	0.3	V
			V _{CC} ≥ 2.5V, I _{sink} = 4mA	-	-	0.3	
			V _{CC} ≥ 4.5V, I _{sink} = 9mA	-	-	0.4	
Open-Drain Output Leakage Current		I _{LKG}	-	-	-	1	μA
Voltage Threshold*		V _{TH-}	+25°C	(V _{TH-}) ×0.98	V _{TH-}	(V _{TH-}) ×1.02	V
			-40°C~85°C	(V _{TH-}) ×0.975	V _{TH-}	(V _{TH-}) ×1.025	
		V _{TH+}	+25°C	(V _{TH+}) ×0.98	V _{TH+}	(V _{TH+}) ×1.02	
			-40°C~85°C	(V _{TH+}) ×0.975	V _{TH+}	(V _{TH+}) ×1.025	
Voltage threshold Hysteresis		V _{HYST}	V _{HYST} = [(V _{TH+})-(V _{TH-})]/(V _{TH-}) ×100%	3	4.5	6	%
Pushbutton Detect		P _{BDV}	-40°C~85°C, V _{CC} = 5V	0.7	-	1.2	V
Internal Pull-Up Resistor		R _P	-	3.75	5	6.25	kΩ

* V_{TH+} = 1.05 × V_{TH-}. V_{TH-} is V_{CC} dropping from high to low voltage. V_{TH+} is V_{CC} rising from low to high voltage.

AC Electrical Characteristics

Timing Diagram

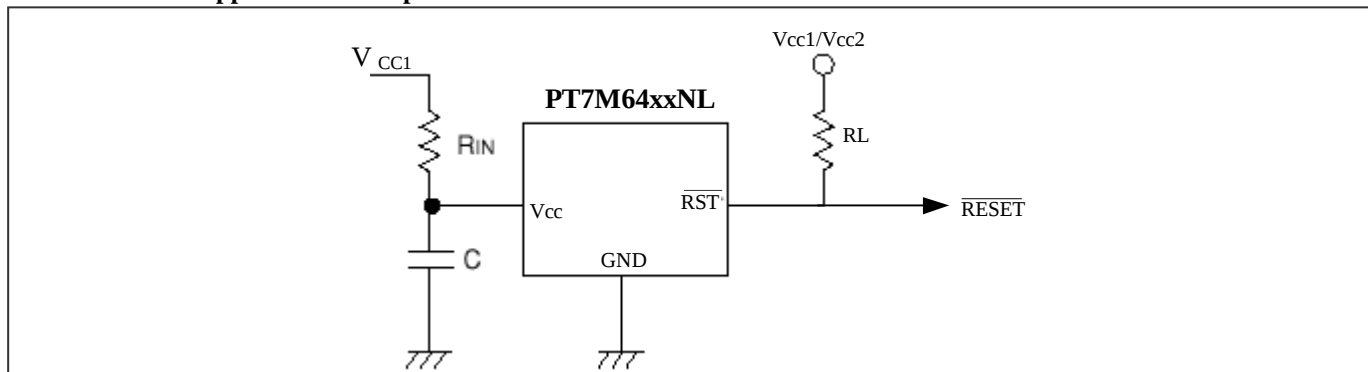


($V_{CC} = 1.2V$ to $5.5V$, $T_A = -40 \sim 85^\circ C$, unless otherwise noted. Typical values are at $T_A = +25^\circ C$)

Sym	Description	Test Conditions	Min	Typ	Max	Unit
t_{RP}	Timeout Period	$T_A = +25^\circ C$	120	260	430	ms
t_p	Delay	-	-	35	-	μs

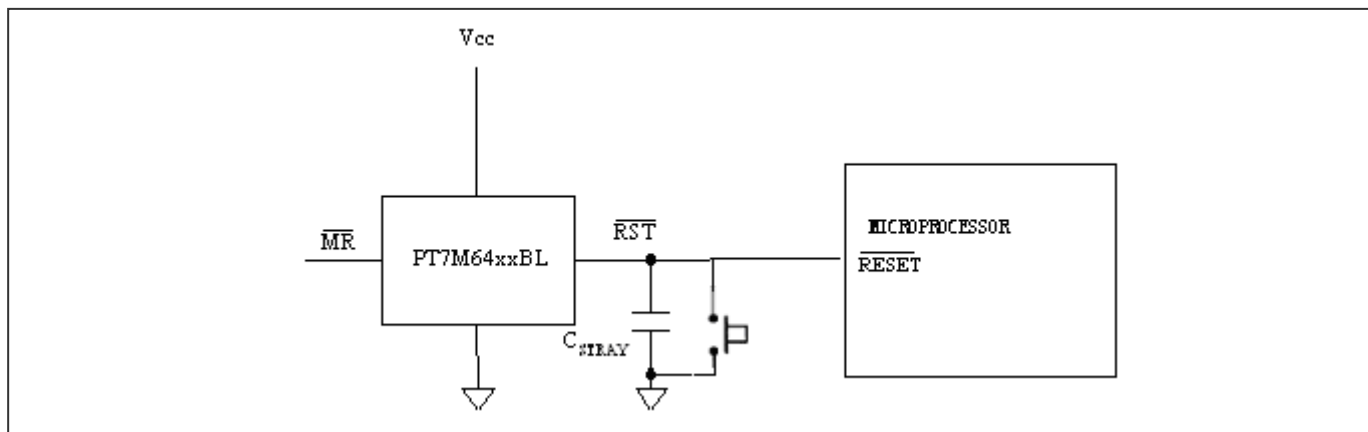
Typical Operation Circuit

PT7M64xxNL Application Example



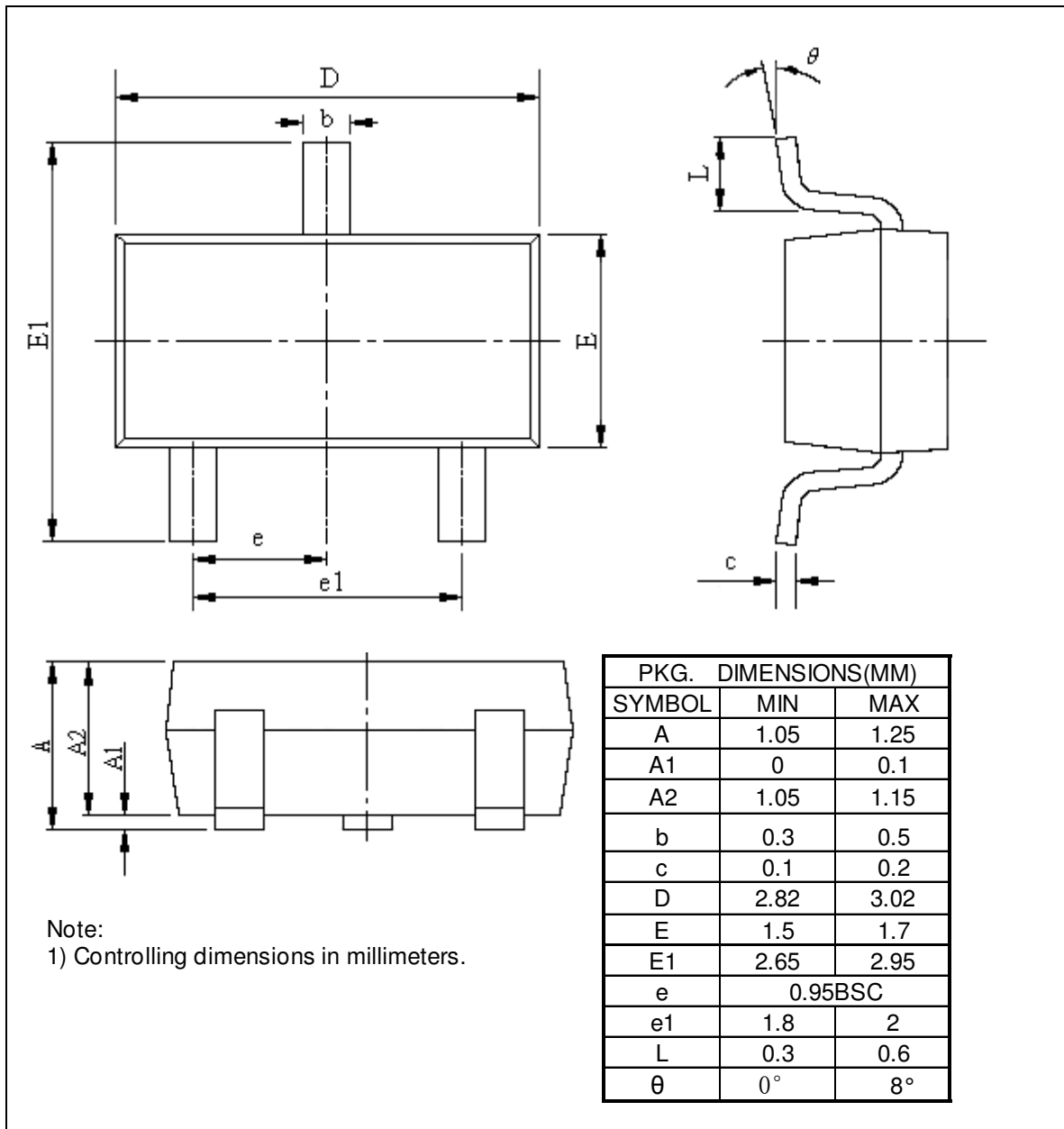
For typical application, R_L could be $100k\Omega$, R_{IN} less than $10k\Omega$ and that C more than $0.1\mu F$.

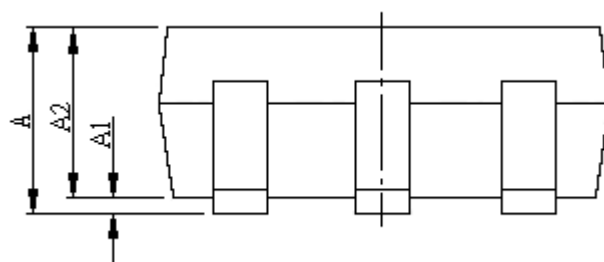
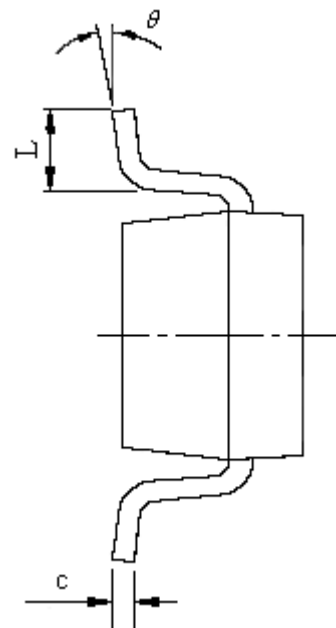
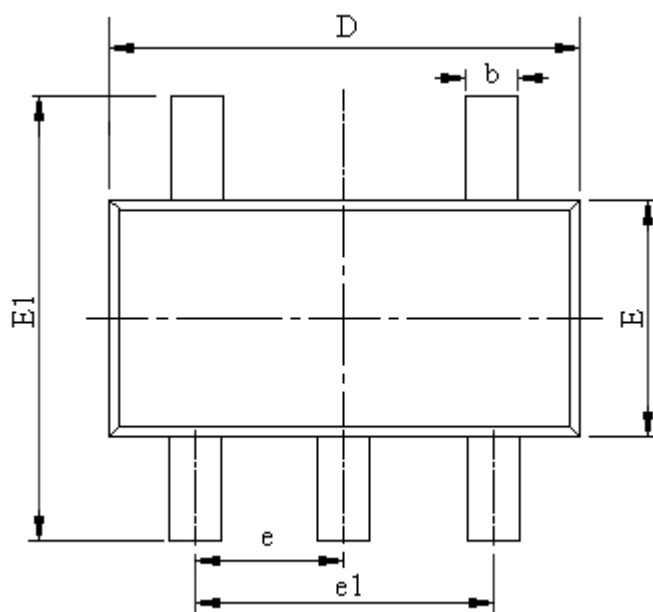
PT7M64xxBL Application Example



Mechanical Information

TA3 (SOT23-3)

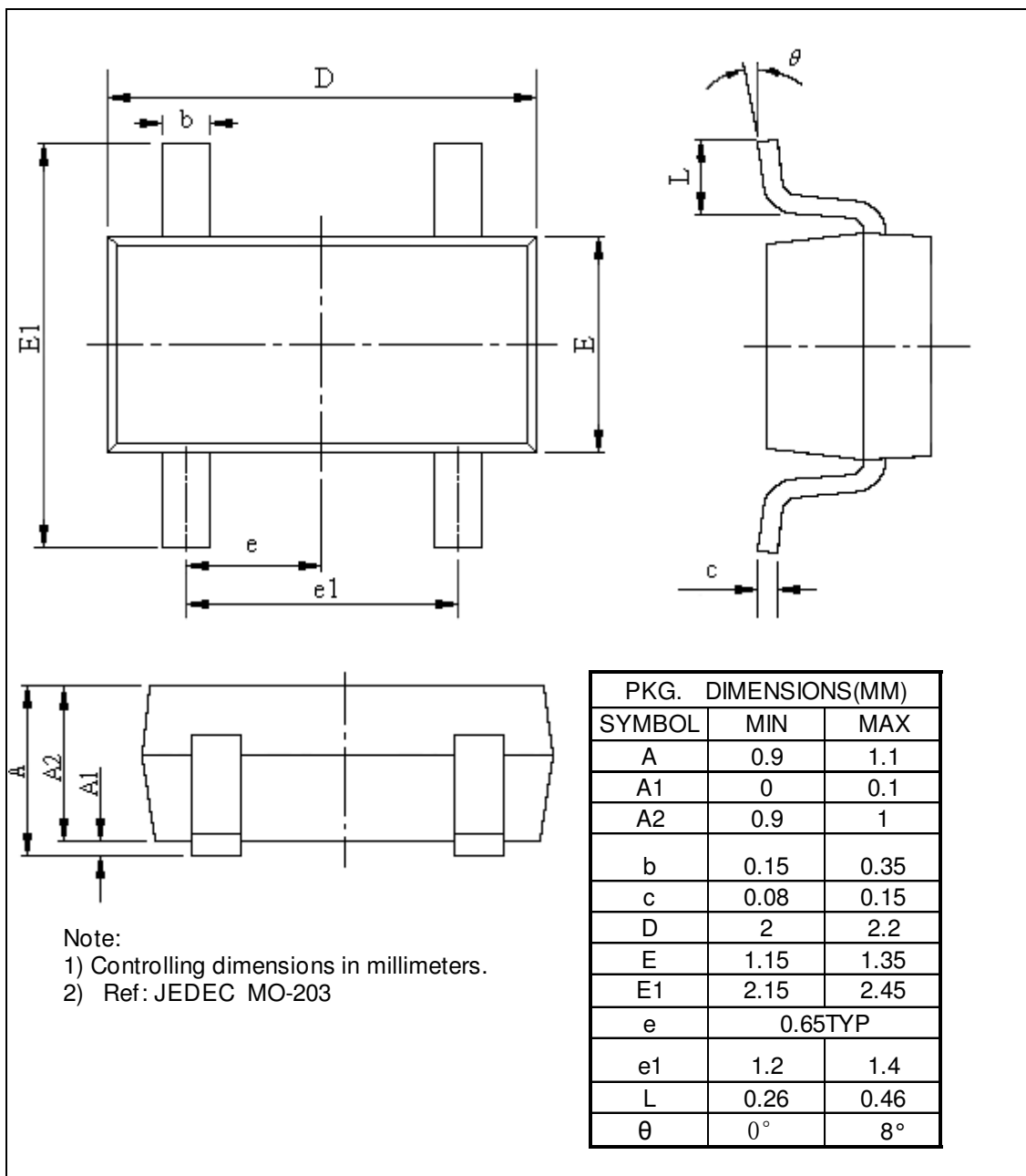


TA5 (SOT23-5)


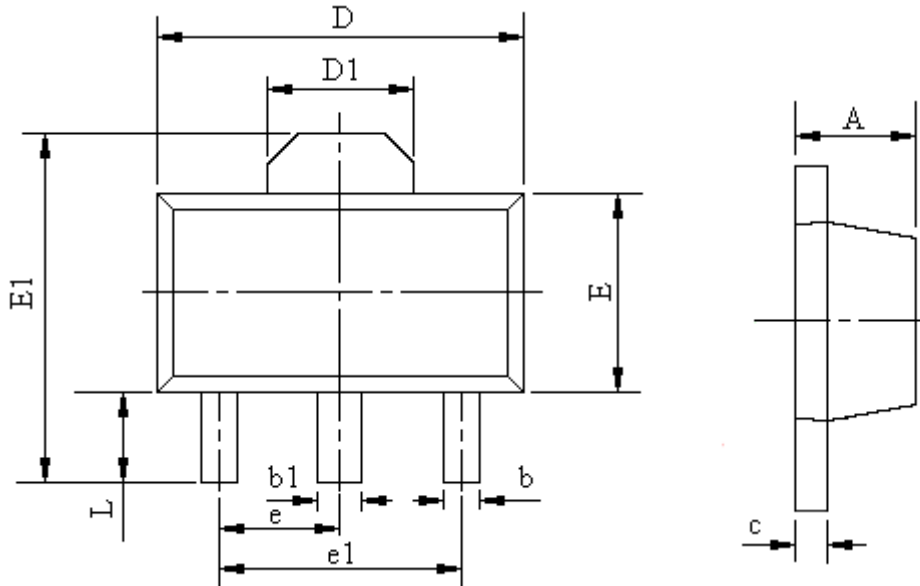
Note:

- 1) Controlling dimensions in millimeters.
- 2) Ref: JEDEC MO-178C/AA

PKG. DIMENSIONS(MM)		
SYMBOL	MIN	MAX
A	1.05	1.25
A1	0.00	0.10
A2	1.05	1.15
b	0.30	0.50
c	0.10	0.20
D	2.82	3.02
E	1.50	1.70
E1	2.65	2.95
e	0.95BSC	
e1	1.80	2.00
L	0.30	0.60
θ	0°	8°

C4 (SC70-4)


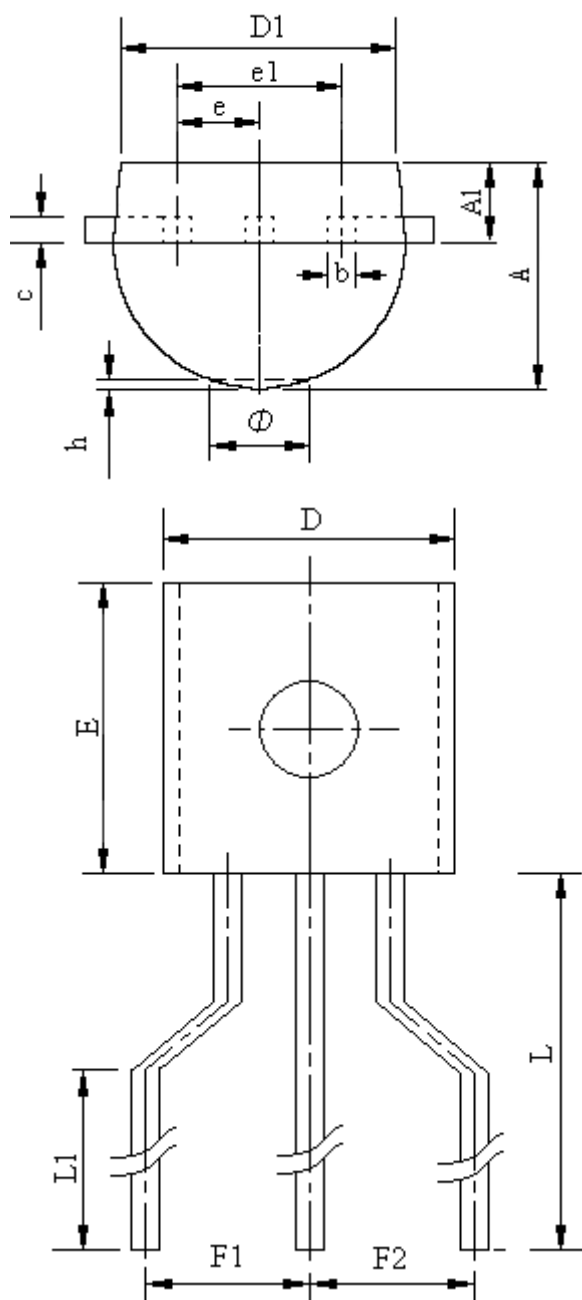
TD(SOT89)



Note:

- 1) Controlling dimensions in millimeters.
- 2) Ref: JEDEC TO-243C/AA

PKG. DIMENSIONS(MM)		
SYMBOL	MIN	MAX
A	1.4	1.6
b	0.32	0.52
b1	0.4	0.58
c	0.35	0.44
D	4.4	4.6
D1	1.55REF	
E	2.3	2.6
E1	3.94	4.25
e	1.50TYP	
e1	3.00TYP	
L	0.9	1.2

NB (TO92-3)


PKG. DIMENSIONS(MM)		
SYMBOL	MIN	MAX
A	3.3	3.7
A1	1.1	1.4
b	0.38	0.55
c	0.36	0.51
D	4.30	4.70
D1	3.43	
E	4.30	4.70
e	1.27TYP	
e1	2.44	2.64
F1	2.50TYP	
F2	2.50TYP	
L	12	13
L1	9.00	10.00
φ		1.6
h	0.00	0.38

Ordering Information

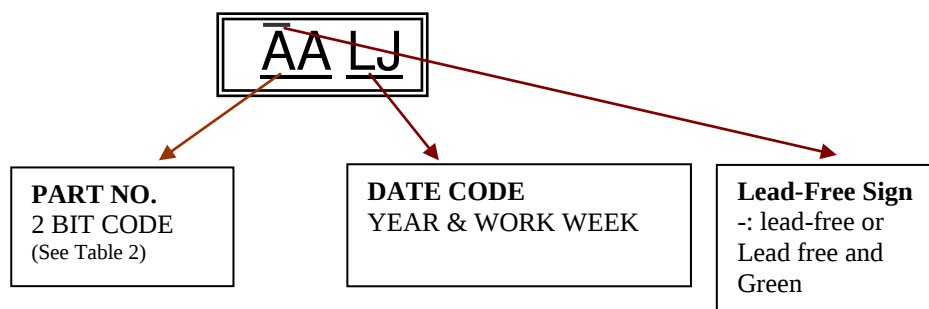
Part Number	Package Code	Package
PT7M64xxCLTA3E	TA3	Lead free and Green SOT23-3
PT7M64xxCLTA5E	TA5	Lead free and Green SOT23-5
PT7M64xxCLC4E	C4	Lead free and Green SC70-4
PT7M64xxCLTDE	TD	Lead free SOT89
PT7M64xxCLBTA5E	TA5	Lead free and Green SOT23-5
PT7M64xxCLBC4E	C4	Lead free and Green SC70-4
PT7M64xxCHTA3E	TA3	Lead free and Green SOT23-3
PT7M64xxCHTA5E	TA5	Lead free and Green SOT23-5
PT7M64xxCHC4E	C4E	Lead free and Green SC70-4
PT7M64xxCHNBE	NB	Lead free TO92
PT7M64xxCHTDE	TD	Lead free SOT89
PT7M64xxCHBTA5E	TA5	Lead free and Green SOT23-5
PT7M64xxNLLC4E	C4	Lead free and Green SC70-4
PT7M64xxNLTA3E	TA3	Lead free and Green SOT23-3
PT7M64xxNLTA5E	TA5	Lead free and Green SOT23-5
PT7M64xxNLC4E	C4	Lead free and Green SC70-4
PT7M64xxNLTDE	TD	Lead free SOT89
PT7M64xxNLBTA5E	TD	Lead free and Green SOT23-5
PT7M64xxBLTA3E	TA3	Lead free and Green SOT23-3
PT7M64xxBLTA5E	TA5	Lead free and Green SOT23-5
PT7M64xxBLTDE	TD	Lead free SOT89
PT7M64xxBLBTA5E	TA5	Lead free and Green SOT23-5

Note:

- “xx” refer to voltage range, see below table 1.
- E = Pb-free or Pb-free and Green
- Adding X Suffix= Tape/Reel
- Contact Pericom for availability.

Table.2 Suffix “xx” definition of PT7M64xx

Suffix xx	V _{TH} (V)	Suffix xx	V _{TH} (V)	Suffix xx	V _{TH} (V)	Suffix xx	V _{TH} (V)	Suffix xx	V _{TH} (V)
18	1.8	25	2.5	32	3.2	39	3.9	46	4.6
19	1.9	26	2.6	33	3.3	40	4.0	47	4.7
20	2.0	27	2.7	34	3.4	41	4.1	48	4.8
21	2.1	28	2.8	35	3.5	42	4.2	49	4.9
22	2.2	29	2.9	36	3.6	43	4.3	50	5.0
23	2.3	30	3.0	37	3.7	44	4.4		
24	2.4	31	3.1	38	3.8	45	4.5		

SOT-23/SC-70 Package Top Marking Instruction


Example: AALJ → PART NO.: PT7M64XXCL
DATE CODE: YEAR 2003 WW10

Example: $\bar{A}$ ALJ → PART NO.: PT7M64XXCLE
DATE CODE: YEAR 2003 WW10
Lead free package or Lead free and Green package

Table 3

No.	Part No.	Code	No.	Part No.	Code	No.	Part No.	Code
1	PT7M6418CL	at	54	PT7M6435NL	de	107	PT7M6425BL	fm
2	PT7M6418CH	au	55	PT7M6436CL	df	108	PT7M6426BL	fo
3	PT7M6418NL	av	56	PT7M6436CH	dg	109	PT7M6427BL	fq
4	PT7M6419CL	aw	57	PT7M6436NL	dh	110	PT7M6428BL	fs
5	PT7M6419CH	ax	58	PT7M6437CL	di	111	PT7M6429BL	fu
6	PT7M6419NL	ay	59	PT7M6437CH	dj	112	PT7M6430BL	fw
7	PT7M6420CL	az	60	PT7M6437NL	dk	113	PT7M6431BL	fy
8	PT7M6420CH	ba	61	PT7M6438CL	dl	114	PT7M6432BL	ga
9	PT7M6420NL	bb	62	PT7M6438CH	dm	115	PT7M6433BL	gc
10	PT7M6421CL	bc	63	PT7M6438NL	dn	116	PT7M6434BL	ge
11	PT7M6421CH	bd	64	PT7M6439CL	do	117	PT7M6435BL	gh
12	PT7M6421NL	be	65	PT7M6439CH	dp	118	PT7M6436BL	gj
13	PT7M6422CL	bf	66	PT7M6439NL	dq	119	PT7M6437BL	gl
14	PT7M6422CH	bg	67	PT7M6440CL	dr	120	PT7M6438BL	gn
15	PT7M6422NL	bh	68	PT7M6440CH	ds	121	PT7M6439BL	gp
16	PT7M6423CL	bi	69	PT7M6440NL	dt	122	PT7M6440BL	gr
17	PT7M6423CH	bj	70	PT7M6441CL	du	123	PT7M6441BL	gt
18	PT7M6423NL	bk	71	PT7M6441CH	dv	124	PT7M6442BL	gv
19	PT7M6424CL	bl	72	PT7M6441NL	dw	125	PT7M6443BL	gx
20	PT7M6424CH	bm	73	PT7M6442CL	dx	126	PT7M6444BL	gz
21	PT7M6424NL	bn	74	PT7M6442CH	dy	127	PT7M6445BL	hb
22	PT7M6425CL	bo	75	PT7M6442NL	dz	128	PT7M6446BL	hd
23	PT7M6425CH	bp	76	PT7M6443CL	ea	129	PT7M6447BL	hf
24	PT7M6425NL	bq	77	PT7M6443CH	eb	130	PT7M6448BL	hh
25	PT7M6426CL	br	78	PT7M6443NL	ec	131	PT7M6449BL	hj
26	PT7M6426CH	bs	79	PT7M6444CL	ed	132	PT7M6450BL	hl
27	PT7M6426NL	bt	80	PT7M6444CH	ee	133	PT7M6426NLL	iy
28	PT7M6427CL	bu	81	PT7M6444NL	ef	134	PT7M6427NLL	iz
29	PT7M6427CH	bv	82	PT7M6445CL	eg	135	PT7M6428NLL	ja
30	PT7M6427NL	bw	83	PT7M6445CH	eh	136	PT7M6429NLL	jb
31	PT7M6428CL	bx	84	PT7M6445NL	ei	137	PT7M6430NLL	jc
32	PT7M6428CH	by	85	PT7M6446CL	ej	138	PT7M6431NLL	jd
33	PT7M6428NL	bz	86	PT7M6446CH	ek	139	PT7M6432NLL	je
34	PT7M6429CL	ca	87	PT7M6446NL	el	140	PT7M6433NLL	jf
35	PT7M6429CH	cb	88	PT7M6447CL	em	141	PT7M6418CLB	yx
36	PT7M6429NL	cd	89	PT7M6447CH	en	142	PT7M6419CLB	yy
37	PT7M6430CL	ce	90	PT7M6447NL	eo	143	PT7M6420CLB	yz
38	PT7M6430CH	cf	91	PT7M6448CL	ep	144	PT7M6421CLB	za
39	PT7M6430NL	cg	92	PT7M6448CH	eq	145	PT7M6422CLB	zb
40	PT7M6431CL	ch	93	PT7M6448NL	er	146	PT7M6423CLB	zc
41	PT7M6431CH	ci	94	PT7M6449CL	es	147	PT7M6424CLB	zd
42	PT7M6431NL	cj	95	PT7M6449CH	et	148	PT7M6425CLB	ze
43	PT7M6432CL	cl	96	PT7M6449NL	eu	149	PT7M6426CLB	zf
44	PT7M6432CH	cm	97	PT7M6450CL	ev	150	PT7M6427CLB	zg
45	PT7M6432NL	cn	98	PT7M6450CH	ew	151	PT7M6428CLB	zh
46	PT7M6433CL	cq	99	PT7M6450NL	ex	152	PT7M6429CLB	zi
47	PT7M6433CH	cr	100	PT7M6418BL	ey	153	PT7M6430CLB	zj
48	PT7M6433NL	ct	101	PT7M6419BL	fa	154	PT7M6431CLB	zk
49	PT7M6434CL	cy	102	PT7M6420BL	fc	155	PT7M6432CLB	zl
50	PT7M6434CH	da	103	PT7M6421BL	fe	156	PT7M6433CLB	zm
51	PT7M6434NL	db	104	PT7M6422BL	fg	157	PT7M6434CLB	zn
52	PT7M6435CL	dc	105	PT7M6423BL	fi	158	PT7M6435CLB	zo
53	PT7M6435CH	dd	106	PT7M6424BL	fk	159	PT7M6436CLB	zp

To be continued.

Continued.

No.	Part No.	Code	No.	Part No.	Code	No.	Part No.	Code
160	PT7M6437CLB	zq	209	PT7M6120CHB	bN	258	PT7M6436CHB	dL
161	PT7M6438CLB	zr	210	PT7M6121CHB	bO	259	PT7M6437CHB	dM
162	PT7M6439CLB	zs	211	PT7M6122CHB	bP	260	PT7M6438CHB	dN
163	PT7M6440CLB	zt	212	PT7M6123CHB	bQ	261	PT7M6439CHB	dO
164	PT7M6441CLB	zu	213	PT7M6124CHB	bR	262	PT7M6440CHB	dQ
165	PT7M6442CLB	zv	214	PT7M6125CHB	bS	263	PT7M6441CHB	dR
166	PT7M6443CLB	zw	215	PT7M6126CHB	bT	264	PT7M6442CHB	dS
167	PT7M6444CLB	zx	216	PT7M6127CHB	bU	265	PT7M6443CHB	dT
168	PT7M6445CLB	zy	217	PT7M6128CHB	bV	266	PT7M6444CHB	dU
169	PT7M6446CLB	zz	218	PT7M6129CHB	bW	267	PT7M6445CHB	dV
170	PT7M6447CLB	aA	219	PT7M6130CHB	bX	268	PT7M6446CHB	dW
171	PT7M6448CLB	aB	220	PT7M6131CHB	bY	269	PT7M6447CHB	dX
172	PT7M6449CLB	aC	221	PT7M6132CHB	bZ	270	PT7M6448CHB	dY
173	PT7M6450CLB	aD	222	PT7M6133CHB	cA	271	PT7M6449CHB	dZ
174	PT7M6418NLB	aE	223	PT7M6134CHB	cB	272	PT7M6450CHB	eA
175	PT7M6419NLB	aF	224	PT7M6135CHB	cC	273	PT7M6418BLB	eB
176	PT7M6420NLB	aG	225	PT7M6136CHB	cD	274	PT7M6419BLB	eC
177	PT7M6421NLB	aH	226	PT7M6137CHB	cE	275	PT7M6420BLB	eD
178	PT7M6422NLB	aI	227	PT7M6138CHB	cF	276	PT7M6421BLB	eE
179	PT7M6423NLB	aJ	228	PT7M6139CHB	cG	277	PT7M6422BLB	eF
180	PT7M6424NLB	aK	229	PT7M6140CHB	cH	278	PT7M6423BLB	eG
181	PT7M6425NLB	aL	230	PT7M6141CHB	cI	279	PT7M6424BLB	eH
182	PT7M6426NLB	aM	231	PT7M6142CHB	cJ	280	PT7M6425BLB	eI
183	PT7M6427NLB	aN	232	PT7M6143CHB	cK	281	PT7M6426BLB	eJ
184	PT7M6428NLB	aO	233	PT7M6144CHB	cL	282	PT7M6427BLB	eK
185	PT7M6429NLB	aP	234	PT7M6145CHB	cM	283	PT7M6428BLB	eL
186	PT7M6430NLB	aQ	235	PT7M6146CHB	cN	284	PT7M6429BLB	eM
187	PT7M6431NLB	aR	236	PT7M6147CHB	cO	285	PT7M6430BLB	eN
188	PT7M6432NLB	aS	237	PT7M6148CHB	cQ	286	PT7M6431BLB	eO
189	PT7M6433NLB	aT	238	PT7M6149CHB	cR	287	PT7M6432BLB	eQ
190	PT7M6434NLB	aU	239	PT7M6150CHB	cS	288	PT7M6433BLB	eR
191	PT7M6435NLB	aV	240	PT7M6418CHB	cT	289	PT7M6434BLB	eS
192	PT7M6436NLB	aW	241	PT7M6419CHB	cU	290	PT7M6435BLB	eT
193	PT7M6437NLB	aX	242	PT7M6420CHB	cV	291	PT7M6436BLB	eU
194	PT7M6438NLB	aY	243	PT7M6421CHB	cW	292	PT7M6437BLB	eV
195	PT7M6439NLB	aZ	244	PT7M6422CHB	cX	293	PT7M6438BLB	eW
196	PT7M6440NLB	bA	245	PT7M6423CHB	cY	294	PT7M6439BLB	eX
197	PT7M6441NLB	bB	246	PT7M6424CHB	cZ	295	PT7M6440BLB	eY
198	PT7M6442NLB	bC	247	PT7M6425CHB	dA	296	PT7M6441BLB	eZ
199	PT7M6443NLB	bD	248	PT7M6426CHB	dB	297	PT7M6442BLB	fA
200	PT7M6444NLB	aE	249	PT7M6427CHB	dC	298	PT7M6443BLB	fB
201	PT7M6445NLB	bF	250	PT7M6428CHB	dD	299	PT7M6444BLB	fC
202	PT7M6446NLB	bG	251	PT7M6429CHB	dE	300	PT7M6445BLB	fD
203	PT7M6447NLB	bH	252	PT7M6430CHB	dF	301	PT7M6446BLB	fE
204	PT7M6448NLB	bI	253	PT7M6431CHB	dG	302	PT7M6447BLB	fF
205	PT7M6449NLB	aJ	254	PT7M6432CHB	dH	303	PT7M6448BLB	fG
206	PT7M6450NLB	bK	255	PT7M6433CHB	dI	304	PT7M6449BLB	fH
207	PT7M6118CHB	bL	256	PT7M6434CHB	dJ	305	PT7M6450BLB	fI
208	PT7M6119CHB	bM	257	PT7M6435CHB	dK			

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