PERICOM®

PT7M1818/1813

Supervisory Circuit

Features

- Highly accurate: ±1.5% (25 ℃)

- Accurate power monitoring: 2.5V, 2.9V, 3.0V (PT7M1818), and 4.1, 4.3, 4.6V (PT7M1813)

- Operating voltage range: 1.0V ~ 5.5V

- Operating temperature range: -40 ℃ to + 85 ℃

- Detect voltage temperature characteristics: ±2.5% × TYP

- Efficient open-drain output with internal 5kΩ pull-up resistor

- Maintains reset for 200ms after V_{CC} returns to an in-tolerance condition
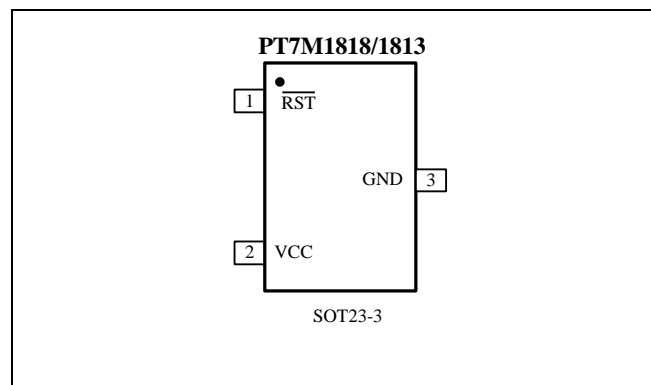
Description

The series are designed to monitor power supplies in µP and digital systems. It provides excellent circuit reliability and low cost by eliminating external components and adjustments.

This device performs a single function: it asserts a reset signal whenever the V_{CC} supply voltage falls below a preset threshold. Reset remains asserted for 200ms after V_{CC} has risen above the reset threshold.

PT7M1818/1813 are bidirectional output, allowing it to be directly connected to µP with bidirectional reset inputs.

Pin Configuration

Pin Description

Name	Type	Description
$\overline{RST}$	I/O	**Reset Output and Pushbutton Input:** $\overline{RST}$ is asserted when V_{CC} drops below voltage threshold V_{TH-}. Active low. When other devices pull $\overline{RST}$ low, the reset condition occurs and will remain a reset timeout period after the external signal is off.
GND	P	**Ground**
V_{CC}	P	**Supply Voltage.**

Maximum Ratings

Storage Temperature .... -65°C to +150°C
Ambient Temperature with Power Applied.......................... -40°C to +85°C
Supply Voltage to Ground Potential (Vcc to GND) .... -0.3V to +7.0V
DC Input Voltage (All inputs except Vcc and GND)...... -0.3V to V_{CC}+0.3V
DC Output Current (All outputs) 30mA
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

(T_A= -40~85 ℃, unless otherwise noted. Typical values are at T_A = +25 ℃)

Description		Sym.	Test Conditions	Min	Typ	Max	Unit
Supply Voltage		V_{CC}		1.0	-	5.5	V
Supply Current		I_{CC}	V_{CC} = 5.5V. No load.	-	-	12	μA
			V_{CC} = 3.6V. No load.	-	-	10	μA
Voltage Threshold		V_{TH-}	+25°C	(V_{TH-}) ×0.985	V_{TH-}	(V_{TH-}) ×1.015	V
			-40°C~85°C	(V_{TH-}) ×0.975	V_{TH-}	(V_{TH-}) ×1.025	V
Hysteresis		V_{HYS}	V_{TH+} - V_{TH-}*	-	50	-	mV
Output Driving	Output low	V_{OL}	I_{OH} = 8mA, V_{CC} = 5V	-	-	0.4	V
			I_{OH} = 4mA, V_{CC} = 3V	-	-	0.3	
			I_{OH} = -50 μA, V_{CC} = 1V	-	-	0.09	
Internal pull-up resistor		Rp	$\overline{RST}$	3.75	5	6.25	kΩ

Note: V_{TH-} is voltage threshold when V_{CC} falls from high to low. V_{TH+} is voltage threshold when V_{CC} rises from low to high.

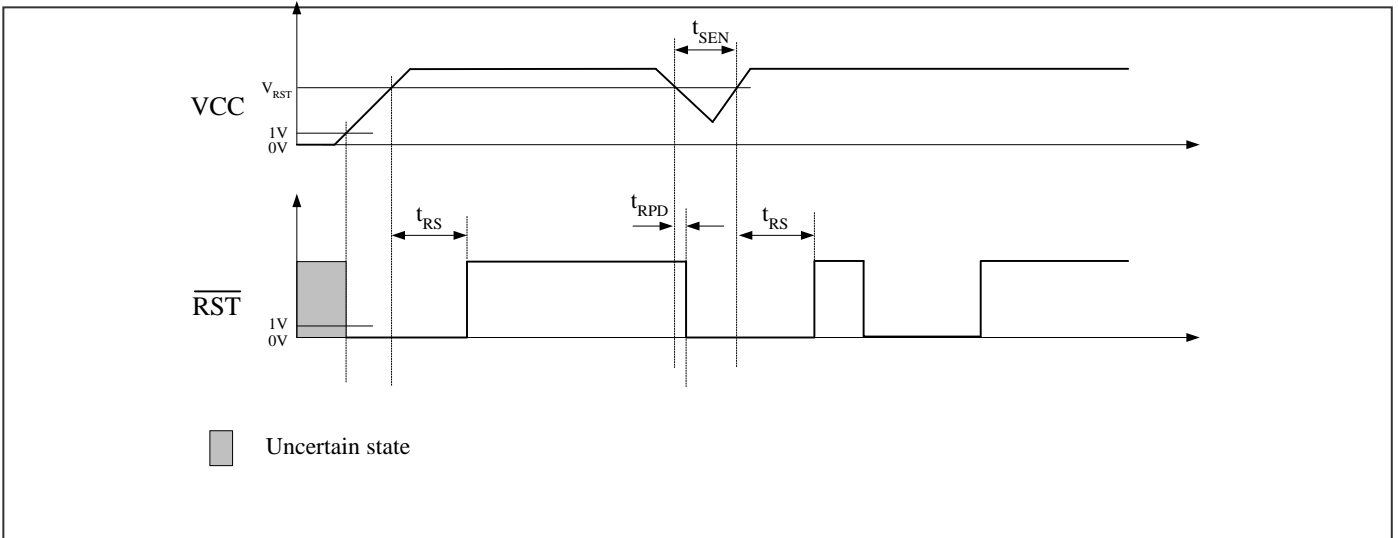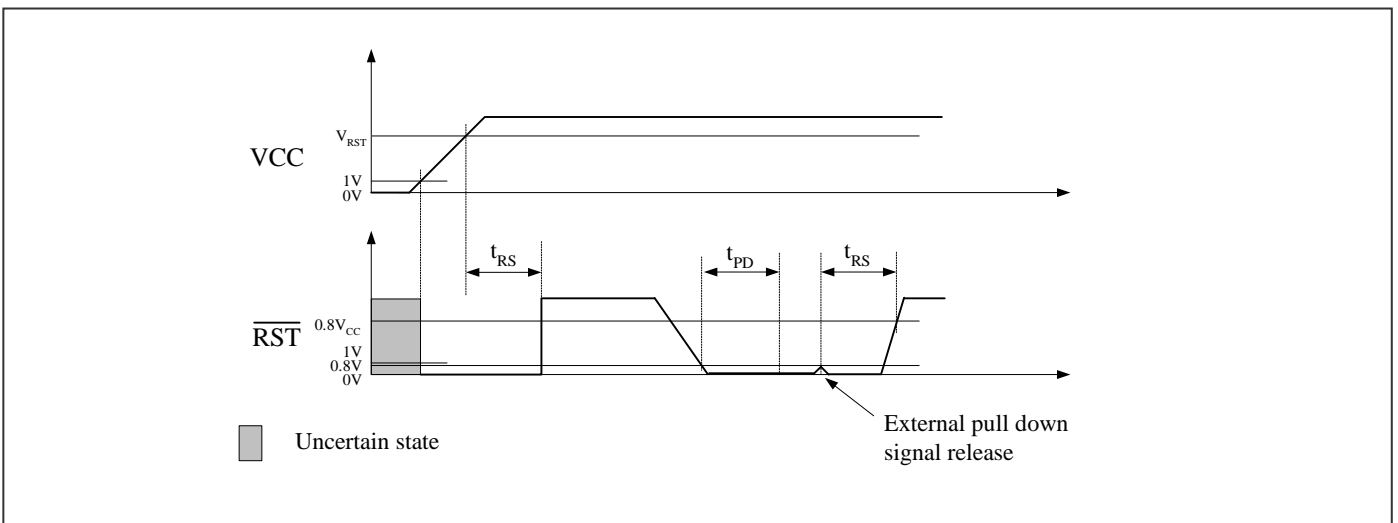## AC Electrical Characteristics

**Fig 1. Timing diagram**

Fig 2. Timing diagram

(V_{CC} = 1.0V to 5.5V, T_A= -40~85 °C, unless otherwise noted. Typical values are at T_A = +25 °C)

Sym.	Description	Test Conditions	Min	Typ	Max	Unit
t_{RS}	Reset Timeout Period	-	140	200	280	ms
t_{RPD}	Delay	-	-	17	-	μs
t_{SEN}	Sensitivity	-	20	-	-	μs
t_{PD}	External Pull Down Signal Pulse	$\overline{RST}$ pin	1	-	-	μs
	Pushbutton Detect*	$\overline{RST}$ pin	0.8	1.5	2.0	V

*Note: $\overline{RST}$ will be asserted when it is pull down to the typical value or less.

Block Diagram
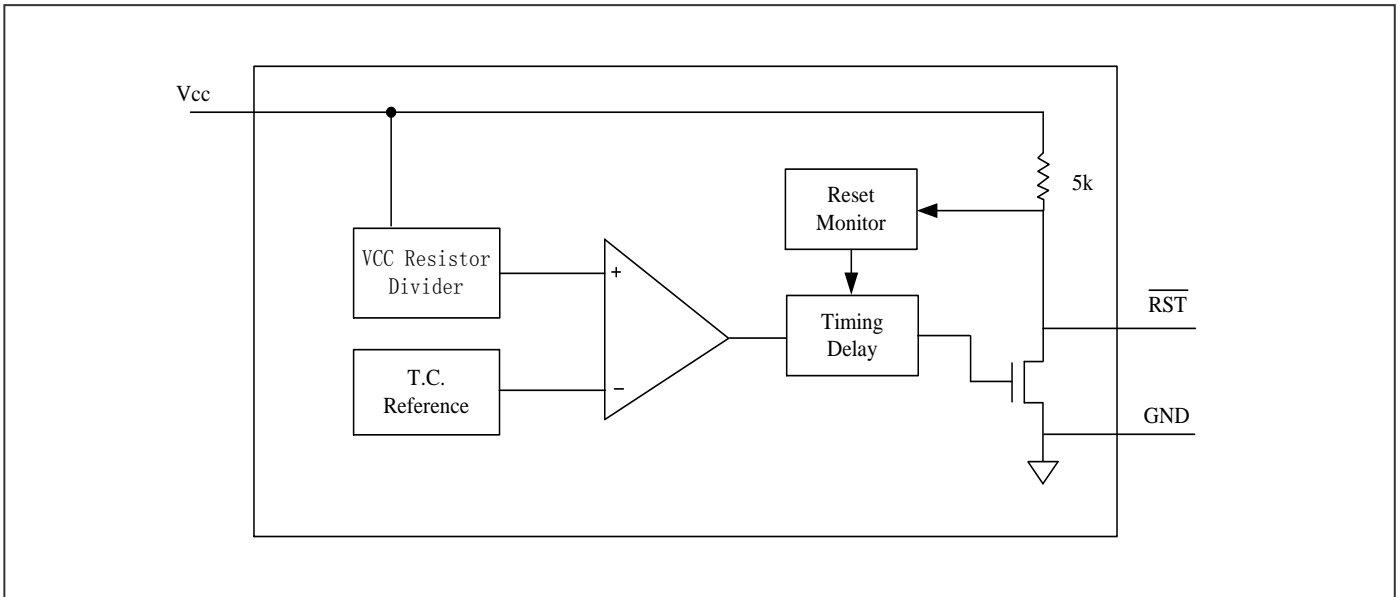
Function Description

Power Monitor

A microprocessor's (μP's) reset input starts the μP in a known state. Whenever the μP is in an unknown state, it should be held in reset. The supervisory circuits assert reset during power-up and prevent code execution errors during power-down or brownout conditions.

On power-up, once Vcc reaches about 1.0V, $\overline{RST}$ is a guaranteed logic low of 0.4V or less. As Vcc rises, $\overline{RST}$ stays low. When Vcc rises above the reset threshold V_{RST}, an internal timer releases $\overline{RST}$ after about 200ms. $\overline{RST}$ asserts whenever Vcc drops below the reset threshold, i.e. brownout condition. If brownout occurs in the middle of a previously initiated reset pulse, the pulse continues for at least another 200ms. On power-down, once Vcc falls below the reset threshold, $\overline{RST}$ stays low and is guaranteed to be 0.4V or less until Vcc drops below 1V.

Reset Output: Bi-direction

The devices provide $\overline{RST}$ output pin for a pushbutton switch. When the devices are not in a reset cycle, it continuously monitors the $\overline{RST}$ signal for a low going edge. If an edge is detected, the devices will debounce the switch by pulling the $\overline{RST}$ line low. After the internal timer has expired, the devices will continue to monitor the $\overline{RST}$ line. If the line is still low, they will continue to monitor the line looking for a rising edge. Upon detecting a release, they will force the $\overline{RST}$ line low and hold it low for 200ms.

Application Information

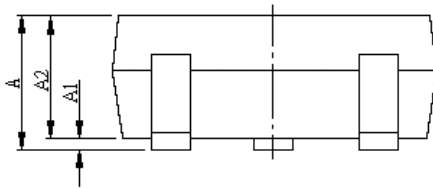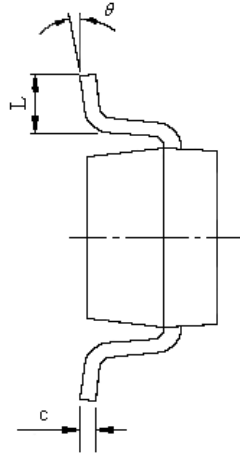**Typical Operation Circuit**
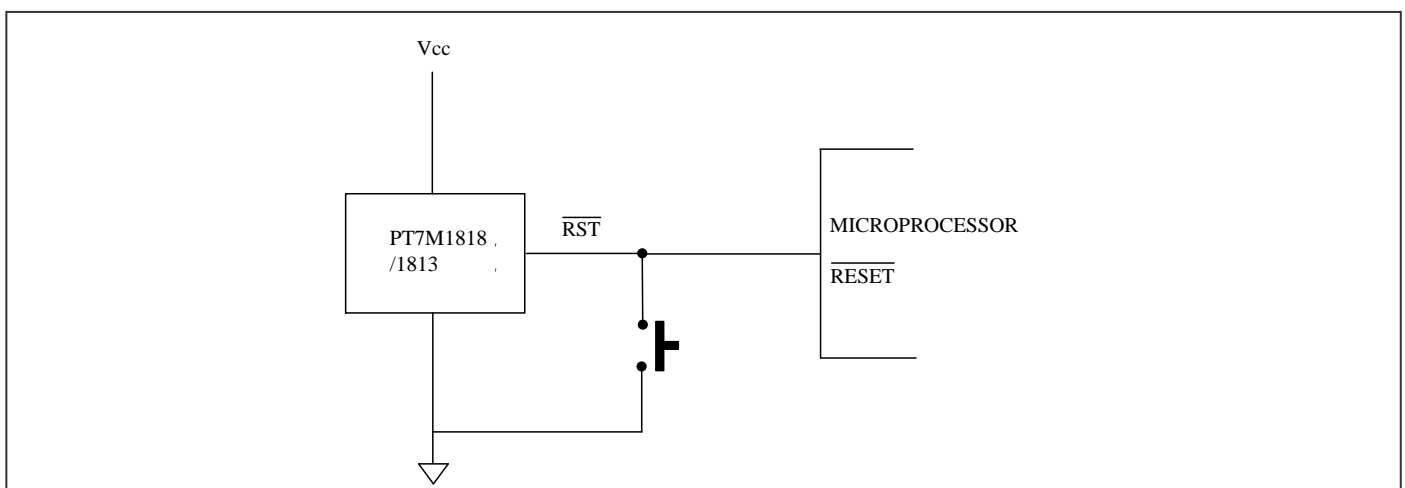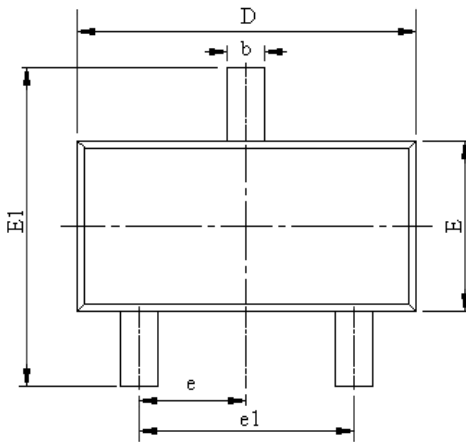
Mechanical Information

SOT23-3

	DOCUMENT CONTROL NO. PD-0018
	REVISION: A
	DATE: 5/17/2011

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°

Note:
1) Controlling dimensions in millimeters.

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3/F., 20 Building ,481 Gui Ping Road,
Shanghai,200233
Tel:(86-21)6485-0576. Fax: (86-21)6485-2181

DESCRIPTION: 3-Pin Small Outline Transistor, Plastic Package, SOT-23

PACKAGE CODE: TA3

Ordering Information

Part Number	Package Code	Package
PT7M1818-20TE	T	Lead free and Green SOT23-3
PT7M1818-10TE	T	Lead free and Green SOT23-3
PT7M1818-5TE	T	Lead free and Green SOT23-3
PT7M1813-15TE	T	Lead free and Green SOT23-3
PT7M1813-10TE	T	Lead free and Green SOT23-3
PT7M1813-5TE	T	Lead free and Green SOT23-3

Note:
- E = Pb-free or Pb-free and Green
- Adding X Suffix= Tape/Reel
- Contact Pericom for availability.
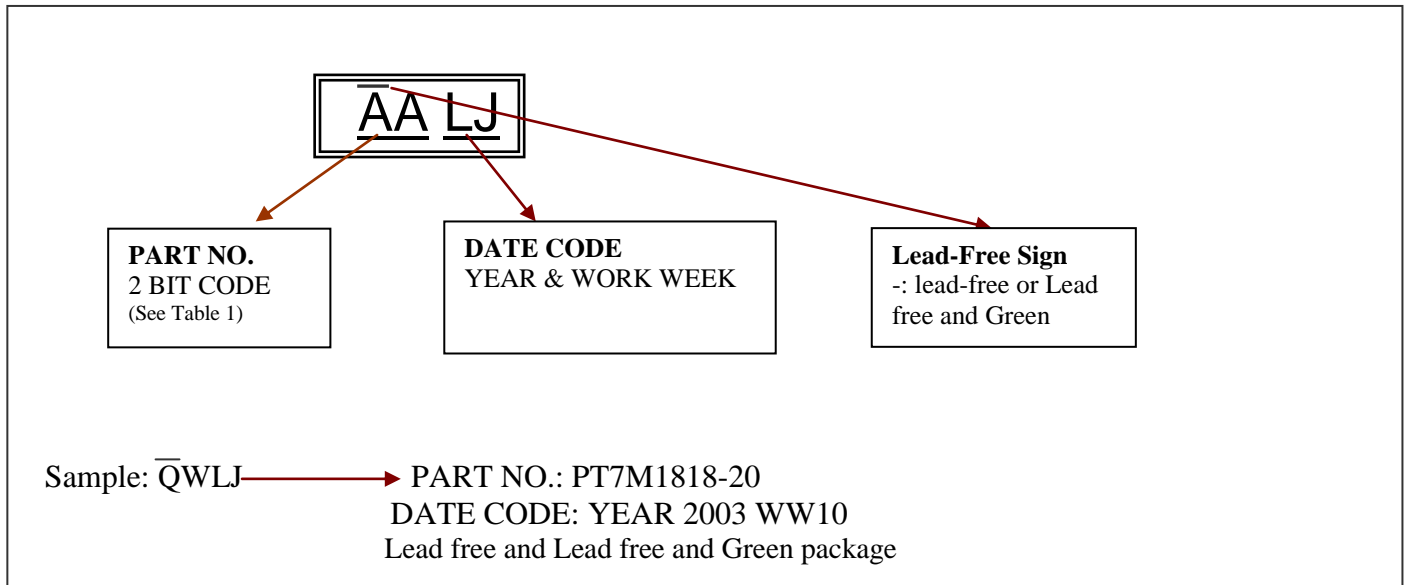
Small Package Top Marking Instruction

$\overline{AA}\ \underline{LJ}$

PART NO.	DATE CODE	Lead-Free Sign
2 BIT CODE	YEAR & WORK WEEK	-: lead-free or Lead free and Green
(See Table 1)		

Sample: $\overline{Q}WLJ$ ⟶ PART NO.: PT7M1818-20
DATE CODE: YEAR 2003 WW10
Lead free and Lead free and Green package

Table 1. Function comparison

Item	Part No.	Reset Output					V_{TH-} (V)
		Open-Drain		Push-Pull		Bi-direct	
		Active high	Active low	Active high	Active low	Active low	
1	PT7M1818-20	-	-	-	-	√	2.5
2	PT7M1818-10	-	-	-	-	√	2.9
3	PT7M1818-5	-	-	-	-	√	3.0
4	PT7M1813-15	-	-	-	-	√	4.1
5	PT7M1813-10	-	-	-	-	√	4.3
6	PT7M1813-5	-	-	-	-	√	4.6

Table 2 Marking code for products

No.	Part No.	Code
1	PT7M1818-20	QW
2	PT7M1818-10	RA
3	PT7M1818-5	RB
4	PT7M1813-15	RL
5	PT7M1813-10	RO
6	PT7M1813-5	RR

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Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

[Diodes Incorporated](#):

  PT7M6101NLTA5EX PT7M6123NLC4EX PT7M6123CLTA3EX PT7M6101CLTA5EX PT7M6124NLTA3EX
PT7M6101CHTA5EX PT7A7514WEX PT7A7513WEX PT7A7513WE PT7A7511WEX PT7A7515WEX
PT7M6127NLC4EX PT7A7512WEX PT7A7534WEX PT7M6315US30D2TBEX PT7M7823KTAEX PT7M7824KTAEX
  PT7M6315US25D3TBEX PT7M6834ID0TA3EX PT7M7811STAEX PT7M1818-5TEX PT7M6315US29D2TBEX
PT7M1813-10TEX PT7M1818-20TEX PT7M7810RTEX PT7M1818-10TEX PT7M6315US29D1TBEX
PT7M6834VD3TA3EX PT7M7812RTAEX PT7M6139CLTA3EX PT7M6146NLTA3EX PT7M6426CHTA5EX
PT7M6133NLTA3EX PT7M6142NLEC3EX PT7M6140CLTA3EX PT7M6142NLTA3EX PT7M6425NLTA3EX
PT7M6141CLTA3EX PT7M6129NLEC3EX PT7M6134NLTA3EX PT7M6127NLTA3EX PT7M6140NLTA3EX
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PT7M6139NLTA3EX PT7M6136CLTA3EX PT7M6126NLTA3EX PT7M6125NLTA3EX PT7M6426CLC4EX
PT7M7803SC3EX PT7M7811RTBEX PT7M6315US30D1TBEX PT7M7452RTA6EX PT7M7452STA6EX
PT7M6314US29D1TBEX PT7M6314US30D1TBEX PT7M6144NLEXVEX PT7M6142NLEXVEX PT7M6144NLEC3EX
  PT7M6128NLTA5EX PT7M6118NLTA3EX PT7M6125CLTA3EX PT7A7521WEX PT7M6428NLTA3EX
PT7M6423CLTA3EX PT7A7535WE PT7M6125NLC4EX PT7M6143NLC4EX PT7M6149NLC4EX
PT7M6139NLC4EX PT7A7535WEX PT7M6422CLTA3EX PT7M6130NLC4EX PT7M6129CLC4EX
PT7M6427NLTA3EX PT7M6126CLC4EX PT7M6132NLC4EX PT7M6135NLC4EX PT7M6129NLC4EX
PT7M6418CLTA3EX PT7M6426CHTA3EX PT7A7534WE PT7M6430NLXVEX PT7M6243CLTA3EX
PT7M6140NLC4EX PT7M6130CLC4EX PT7M6131NLC4EX PT7M7434TAEX PT7M7436TAEX PT7M7438TAEX