MST1174KP , Motorcycle high-power flasher

Features

- Integrated clock circuit inside the chip, stable flashing frequency
- Fixed 1.42Hz flashing frequency
- Cycle by cycle load current limit protection
- Cycle by cycle load short-circuit current limiting protection
- Cycle by cycle over-temperature protection
- Self-recovery function after protection
- 150 mΩ typical conduction resistance
- The chip can withstand voltage up to 45V, improving the reliability of the system
- Compatible with existing flash controller double-wire interface design
- Can support the total power of 30W and 30W within the incandescent lamp
- Available Packages : ESOP8

Application

- Motorcycle,Electric Bicycle Flash Controller
- Neon light Controller
- Alarm Controller
- Signal Light Controller

Description

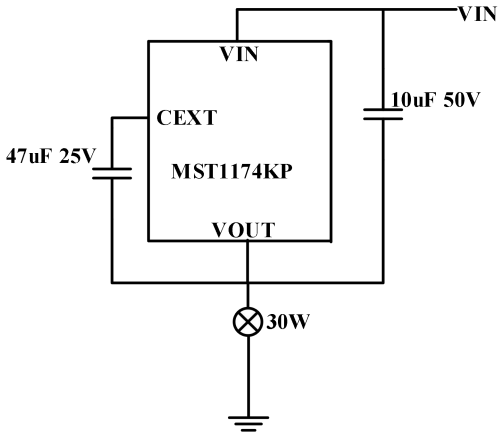
MST1174KP is a special integrated circuit for motorcycle flash controller. DC voltage withstand up to 45V, greatly improve the reliability of flash controller. The scheme is simple, greatly reducing the cost of the scheme, improving production efficiency, reducing product failure efficiency and improving product quality.

When using the chip, simply connect the positive battery terminal to the chip's VIN pin, the VOUT pin to the bulb for connection, and a capacitor placed externally on the CEXT pin. Once a series switch connects the VOUT pin to the bulb, the device will begin to turn on/off with a 50% duty cycle.

An external capacitor (47uF 25V) connected between the CEXT pin and the VOUT pin is used to store electrical energy to power the device during its conduction.

The built-in multiple protection mechanism can prevent the damage of the flash controller and the relevant power supply line on the motorcycle in some abnormal applications, and can automatically solve the protection after the application returns to normal. Improve the reliability of the flash controller and reduce the repair probability of the whole motorcycle.

Typical Application Circuit

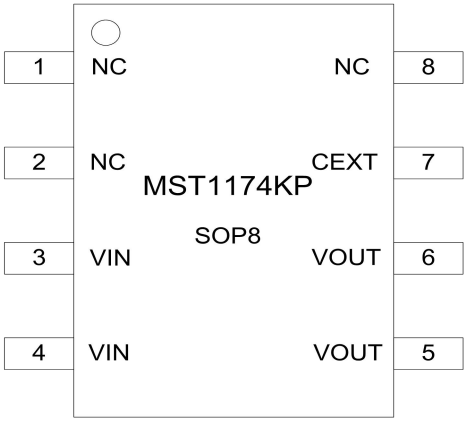


Device Information(1)

PART NUMBER	PACKAGE	BODY SISE(NOM)
MST1174KP	SOP8	6.0mm*4.9mm

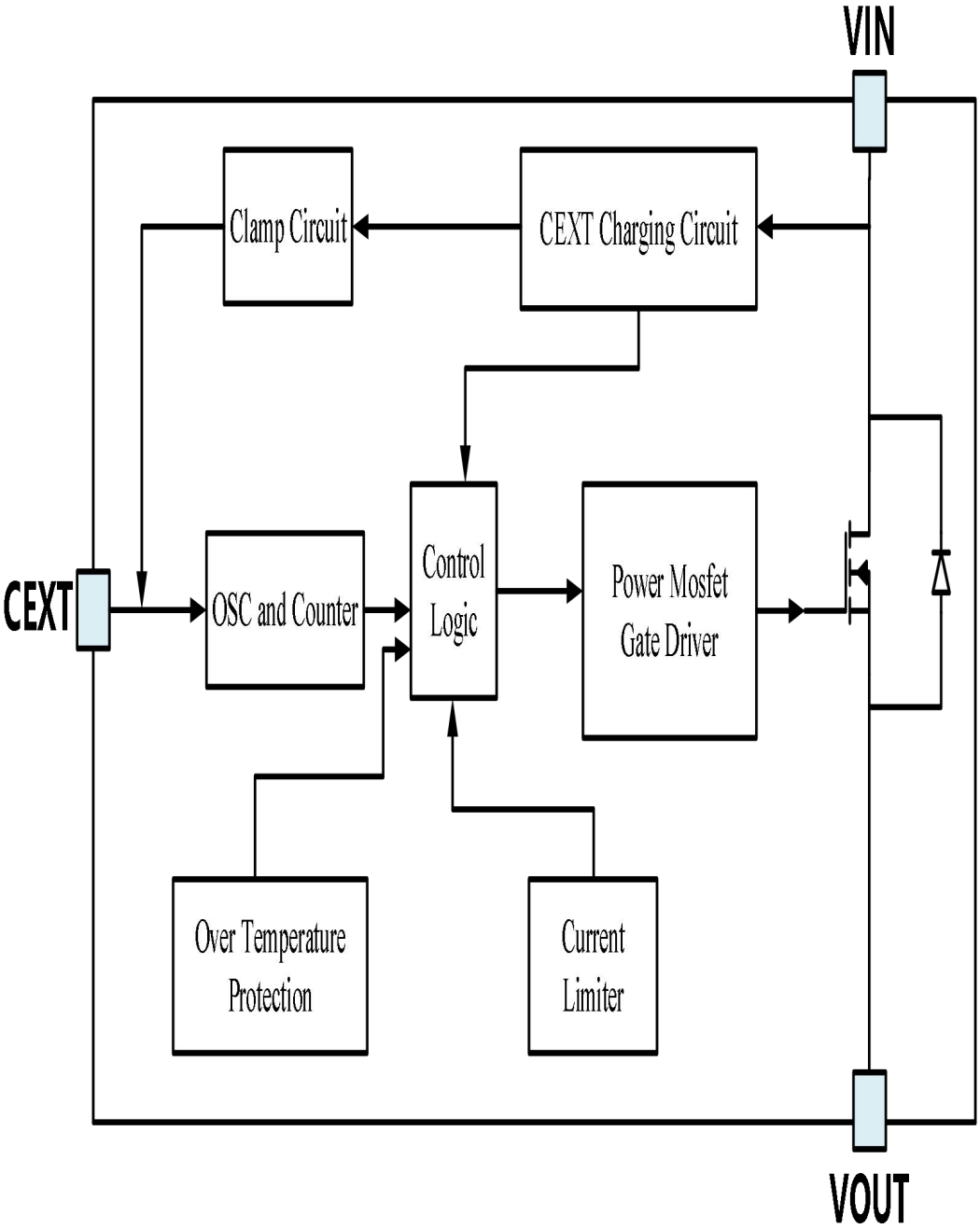
(1) For all available packages, see the order able addendum at the end of the data sheet.

Marking Description



Pin Number	Pin Name	Description
1,2,8	NC	No connection
3,4	VIN	External power input
5,6	VOUT	Flasher output
7	CEXT	Connect external capacitor, internal power supply of chip

Block Diagram



Absolute Maximum Ratings

Item	Description	Min	Max	Unit
Voltage	VIN to VOUT	-0.3	45	V
	CEXT to VOUT	-0.3	5.3	V
Current	Peak Output Current	Internally limited		
Power	Maximum Load Power	35		W
Temperature	Operating Temperature Range	-40	125	℃
	Storage Temperature	-40	150	℃
Thermal Resistance (Junction to Ambient)	SOP8	130		℃/W
Power Dissipation	SOP8	700		mW
Electrostatic Discharge Rating	Human Body Model（HBM）	2		kV
	Charged Device Model（CDM）	200		V

Note:(1)Exceeding the range specified by the rated parameters will cause damage to the chip, and the working state of the chip beyond the range of rated parameters cannot be guaranteed. Exposure outside the rated parameter range will affect the reliability of the chip.

(2)All voltages in the table above are relative to VOUT unless otherwise noted.

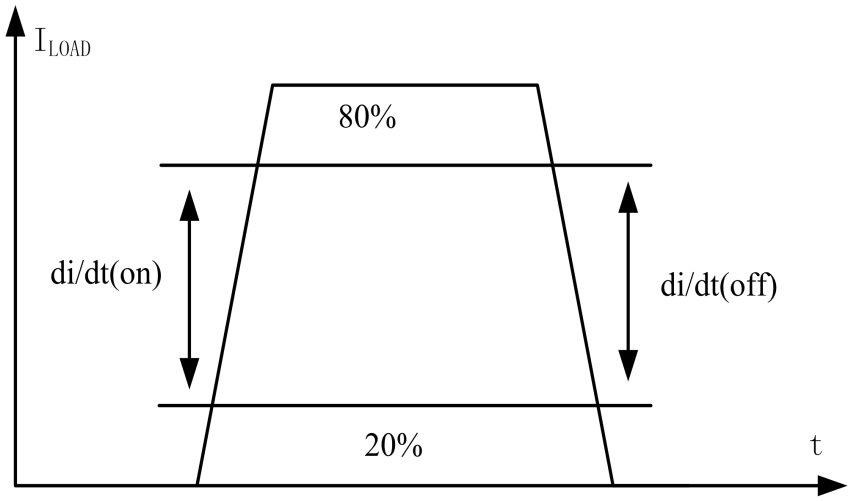
Electrical Characteristics

(At 9V≤V_{IN}≤18V T_A=25°C, unless otherwise noted)

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
V_{IN}	DC Supply Voltage		9		18	V
V_{DD}	CEXT capacitor voltage	V_{IN}=12V		5.3		V
RDS(ON)	On State Resistance	V_{IN}=12V;Ic =1A		150		mΩ
dI/dt(on)	Turn-on Current Slope	R_{LOAD}=20Ω		0.02		A/us
dI/dt(off)	Turn-off Current Slope	R_{LOAD}=20Ω		0.02		A/us
Fosc	Oscillating Frequency		1.25	1.42	1.58	Hz
I_{LIMIT}	Current Limit	R_{LOAD} <100mΩ		12		A
I_{SHORT}	Short Current			12		A
T_{SHDN}	Thermal Shutdown Temperature	Shutdown, temperature increasing		120		℃
		Reset, temperature decreasing		105		

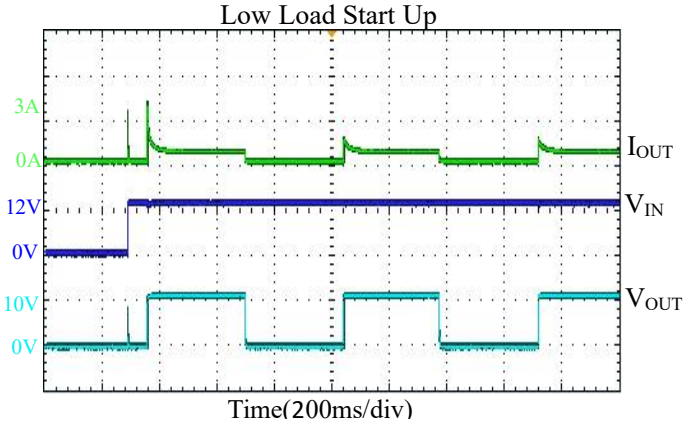
Typical Performance Characteristics

Switching Characteristics



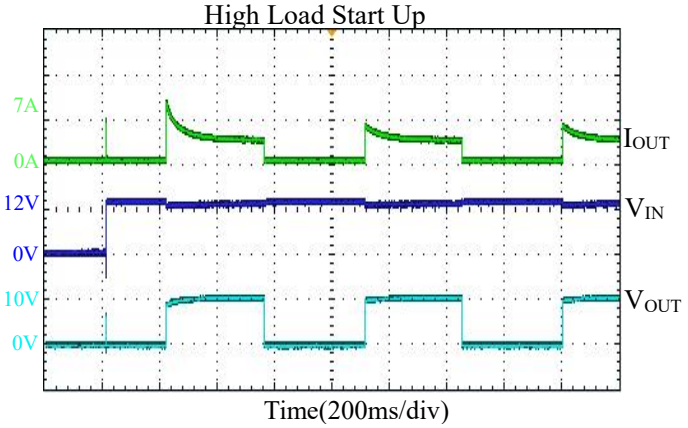
Typical WaveForm Characteristics

Low Load Start Up



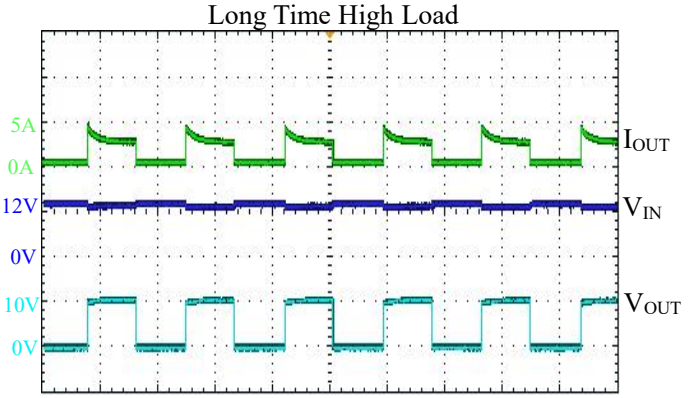
Time(200ms/div)

High Load Start Up



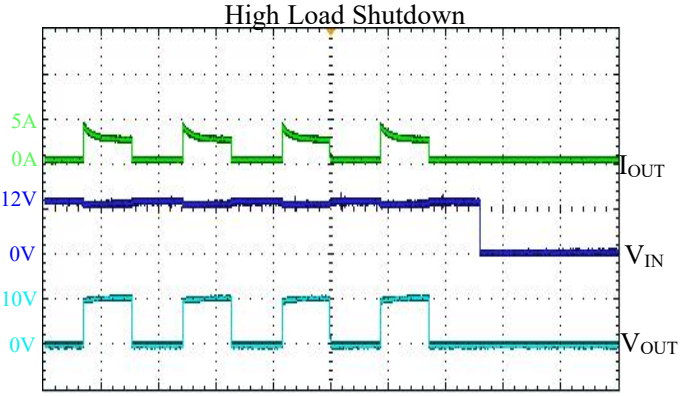
Time(200ms/div)

Long Time High Load



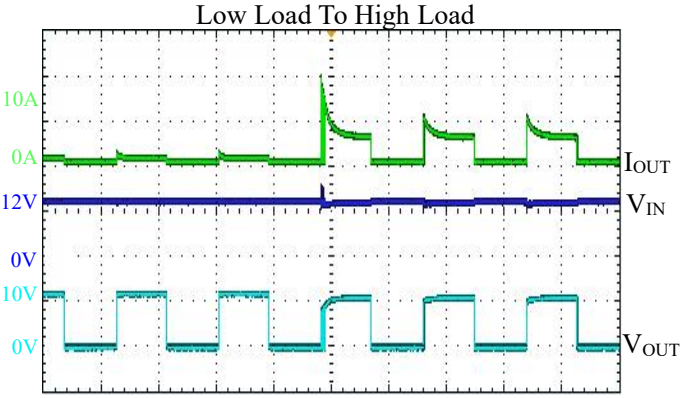
Time(400ms/div)

High Load Shutdown



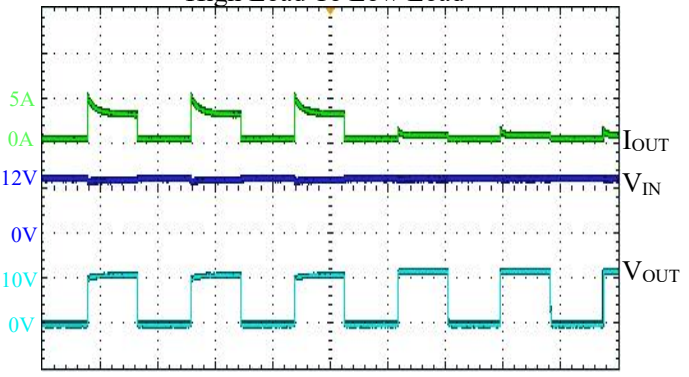
Time(200ms/div)

Low Load To High Load



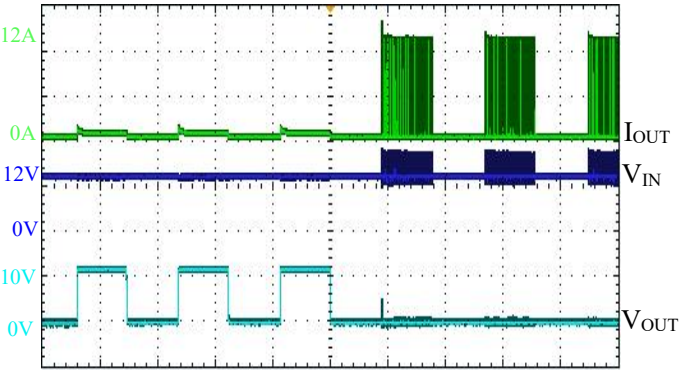
Time(200ms/div)

High Load To Low Load



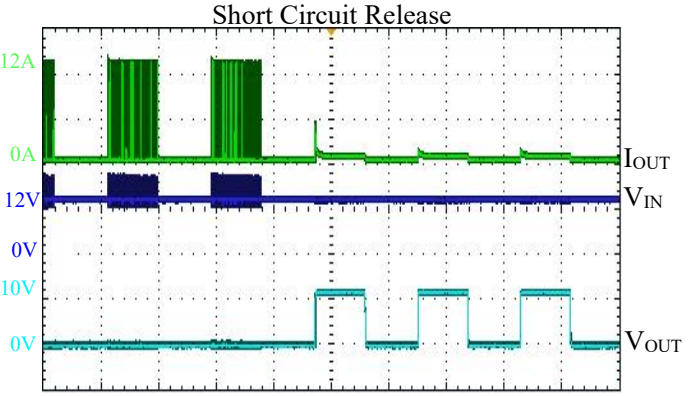
Time(200ms/div)

Short Circuit Protection



Time(400ms/div)

Short Circuit Release



Time(400ms/div)

Detailed Description

Normal operating mode

When the load bulb is connected in series between VOUT and GND, the power VIN charges the CEXT capacitor. When the CEXT capacitor voltage reaches the threshold voltage of 5.3V, the power tube is opened and the load bulb is lit. After about 350ms, the power tube is off, the load bulb is off, and the frequency of bulb opening and closing is about 1.42Hz, with a duty cycle of about 50%.

Current limiting protection function

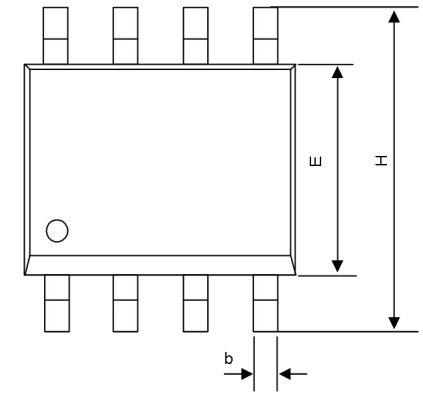
When the load current reaches 12A, MST1174KP will limit the load current to 12A and stop rising, so as to prevent too much current from damaging the flash controller system and power supply line, during which the system overtemperature protection may occur.

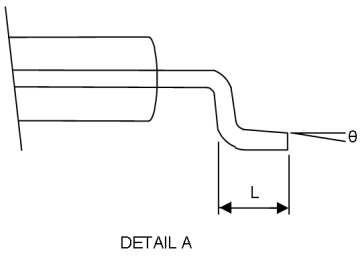
Short circuit, overload and over temperature shut-off

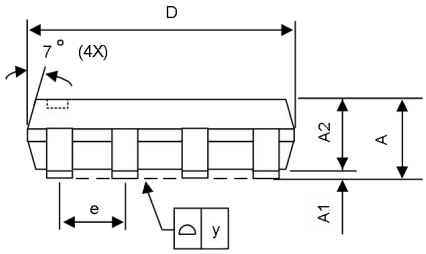
When there is a short circuit or too much load, the internal temperature of the chip rises. When the junction temperature inside the chip rises to 120°C, the power tube is off. If the temperature drops below 105°C in the next cycle, the power tube will be turned on, otherwise it will still be off.

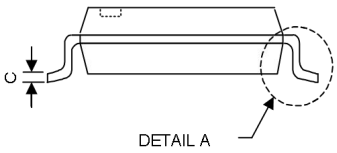
Package Outline

SOP8



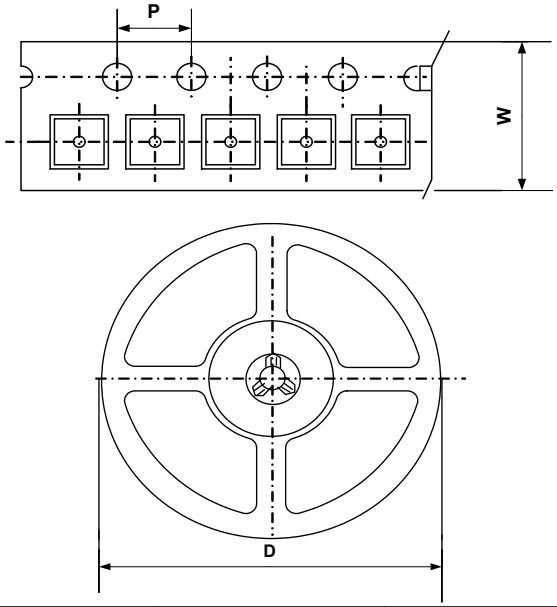






REF.	Millimeter	
	Min.	Max.
A	-	1.75
A1	0.10	0.25
A2	1.25	-
C	0.10	0.25
D	4.70	5.10
E	3.70	4.10
H	5.80	6.20
L	0.40	1.27
b	0.31	0.51
e	1.27BSC	
y	-	0.10
θ	0	8°

Packing Information



Type	W(mm)	P(mm)	D(mm)	Qty (pcs)
SOP8	12.0±0.1 mm	8.0±0.1 mm	330±1 mm	2500pcs

Revision History and Checking Table

Version	Date	Revision Item	Modifier	Function & Spec Checking	Package & Tape Checking
1-0	2023-8-16		Xingxiaolin	Xingxiaolin	Xingxiaolin

IMPORTANT NOTICE

MST INCORPORATED MAKES NO WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, WITH REGARDS TO THIS DOCUMENT, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE (AND THEIR EQUIVALENTS UNDER THE LAWS OF ANY JURISDICTION).

MST Incorporated reserves the right to make modifications, enhancements, improvements, corrections or other changes without further notice to this document and any product described herein. MST Incorporated does not assume any liability arising out of the application or use of this document or any product described herein; neither does MST Incorporated convey any license under its patent or trademark rights, nor the rights of others. Any Customer or user of this document or products described herein in such applications shall assume all risks of such use and will agree to hold MST Incorporated and all the companies whose products are represented on MST Incorporated website, harmless against all damages.

MST Incorporated does not warrant or accept any liability whatsoever in respect of any products purchased through unauthorized sales channel. Should Customers purchase or use MST Incorporated products for any unintended or unauthorized application, Customers shall indemnify and hold MST Incorporated and its representatives harmless against all claims, damages, expenses, and attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized application.

Products described herein may be covered by one or more United States, international or foreign patents pending. Product names and markings noted herein may also be covered by one or more United States, international or foreign trademarks.

X-ON Electronics

Largest Supplier of Electrical and Electronic Components

Click to view similar products for LED Display Drivers ***category:***

Click to view products by MST ***manufacturer:***

Other Similar products are found below :

STP16DP05PTR MP3370GN-Z ISL97631IHTZ-T7A ISL97632IRT26Z-T LV5026MC-AH IK62083DWT OB3655TAP-H OB3399PAP AW36514FCR AW36428FCR KAQW214A TL TM1629(TA2009B) WS2814F XB402U-L27 HT16K33A-20SOP HT16D33A-28SSOP TM1628E TM512AE0 TM512AD TM0822B SY7310AADC SY58863FAC SY5863AJAC FM4115K. TM1638N-SOP28-TA1319B SPL5013CNI-TRG AW21024QNR AW36423FCR AW36515FCR AW99703CSR AW21036QNR AW21009QNR AW20108QNR AW2016AQNR AW9967DNR PT4115BE89E CC1108ST CC1109 SD6800BCTR SDH7612DH HT16D35A-48LQFP-EP HT1635C-64LQFP-7*7 HT1632D-52LQFP-2.0 HT16K33A-28SOP HT16D31A-16NSOP-EP TLD5099EP BCR 431U IS32FL3740-ZLA3-TR PAM2804AAB010(MS) OB3379ZCPA-D