



ON Semiconductor®

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# L88M05T

Monolithic Linear IC

## 17V, 5V / 0.5A Low Dropout Voltage Regulator

### Overview

The L88M05T is low dropout voltage regulator IC with output current of 0.5 A. Because they can operate with a low input-output voltage difference, they contribute to smaller and more efficient set power supplies, and are optimum for audio-visual and office automation equipment.

### Functions

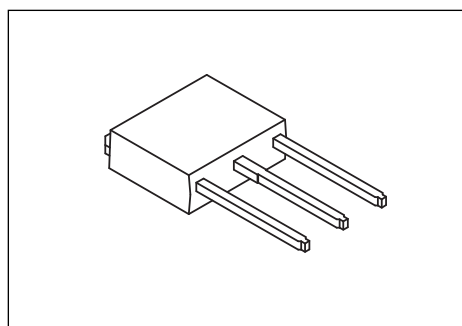
- Output voltage : 5V
- 500 mA output current
- Low minimum input-output voltage differential (0.4V typ) enables to save energy and miniaturize transformer size.
- Set size can be miniaturized with compact TP-3H power package.
- Surface mounting on board permits allowable power dissipation to be raised.
- Enhanced mount flexibility with range of formed products.

### Specifications

**Maximum Ratings** at  $T_a = 25^\circ\text{C}$

Parameter	Symbol	Conditions	Ratings	Unit
Input voltage	$V_{IN \text{ max}}$		18	V
Allowable power dissipation	$P_d \text{ max}$	$T_a \leq 25^\circ\text{C}$ , no heat sink	1	W
		$T_c = 25^\circ\text{C}$ , with infinite heat sink	6.25	W
Thermal resistance (junction-atmosphere)	$\theta_{j-a}$		125	$^\circ\text{C}/\text{W}$
Thermal resistance (junction-to-case)	$\theta_{j-c}$		20	$^\circ\text{C}/\text{W}$
Operating temperature	$T_{opr}$		-20 to +85	$^\circ\text{C}$
Storage temperature	$T_{stg}$		-55 to +150	$^\circ\text{C}$

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.



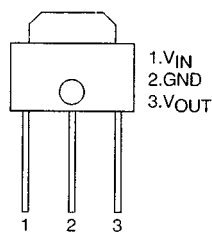
TP3H

### ORDERING INFORMATION

See detailed ordering and shipping information on page 8 of this data sheet.

## L88M00T Series

### Pin Assignment



A10242

Top view

### Operating Conditions at $T_a = 25\text{ }^\circ\text{C}$

Parameter	Symbol	Conditions	Ratings	Unit
Input voltage	$V_{IN}$		5.8 to 17	V
Output current	$I_{OUT}$		0 to 500	mA

### Operating Characteristics at $T_j = 25\text{ }^\circ\text{C}$ , $V_{IN} = 8\text{ V}$ , $I_O = 500\text{ mA}$ , $C_{OUT} = 100\text{ }\mu\text{F}$ , $C_{IN} = 1\text{ }\mu\text{F}$ , see specified Test Circuit.

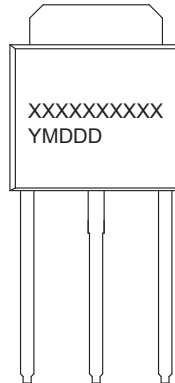
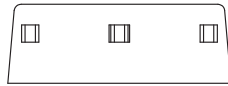
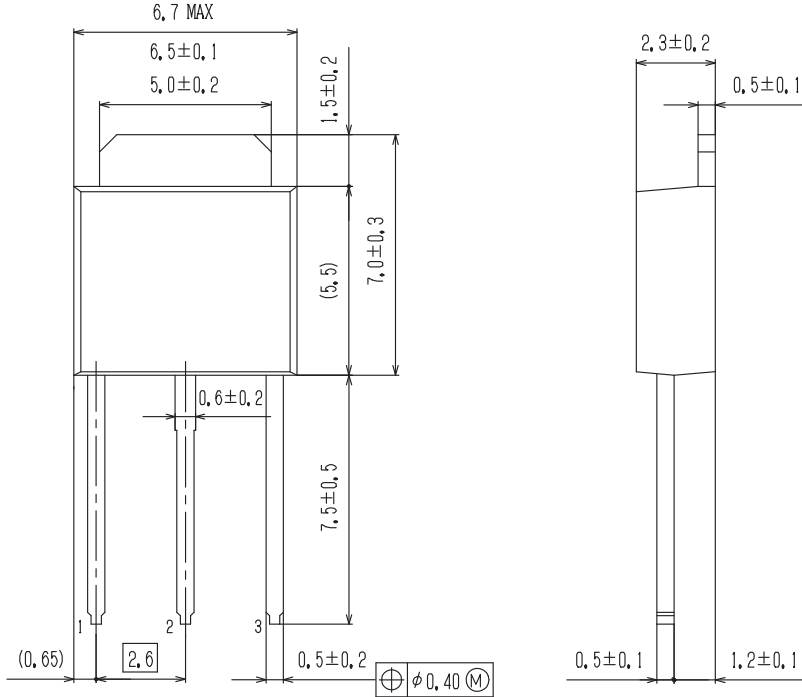
Parameter	Symbol	Conditions	min	typ	max	Unit
Output voltage	$V_{OUT}$		4.85	5.0	5.15	V
Dropout voltage	$V_{DROP1}$			0.4	0.6	V
	$V_{DROP2}$	$I_O = 150\text{ mA}$		0.2	0.3	V
Line regulation	$\Delta V_{OLN}$	5.8 V % $V_{IN}$ % 17 V		10	50	mV
Load regulation	$\Delta V_{OLD}$	5 mA % $I_{OUT}$ % 500 mA		30	100	mV
Peak output current	$I_{OP}$		600	900		mA
Output short-circuit current	$I_{OSC}$			100	300	mA
Quiescent current	$I_{Q1}$	$I_{OUT} = 0$		2.0	5.0	mA
	$I_{Q2}$			24	50	mA
Output noise voltage	$V_{NO}$	10 Hz % f % 100 kHz		40		$\mu\text{V}_{rms}$
Temperature coefficient of output voltage	$\Delta V_{OUT}/\Delta T_j$	$T_j = 25\text{ to }125\text{ }^\circ\text{C}$		$\pm 0.5$		mV/ $^\circ\text{C}$
Ripple rejection	Rrej	f = 120 Hz, 6 V % $V_{IN}$ % 17 V		65		dB

# L88M05T

## Package Dimensions

unit : mm

**IPAK / TP3H**  
**CASE 369AF**  
**ISSUE A**

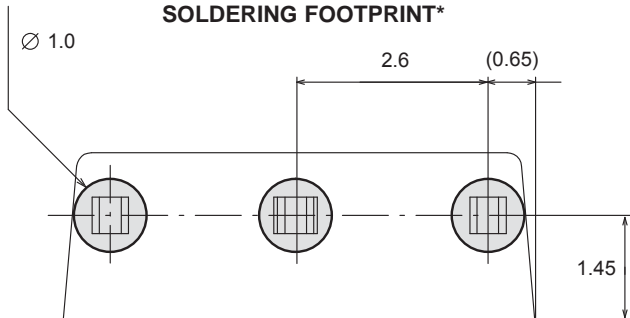


### GENERIC MARKING DIAGRAM\*

XXXXXX = Specific Device Code  
 Y = Year  
 M = Month  
 DDD = Additional Traceability Data

\*This information is generic. Please refer to device data sheet for actual part marking. Pb-Free indicator, "G" or microdot "▪", may or may not be present.

### SOLDERING FOOTPRINT\*



NOTE: The measurements are not to guarantee but for reference only.

(Unit: mm)

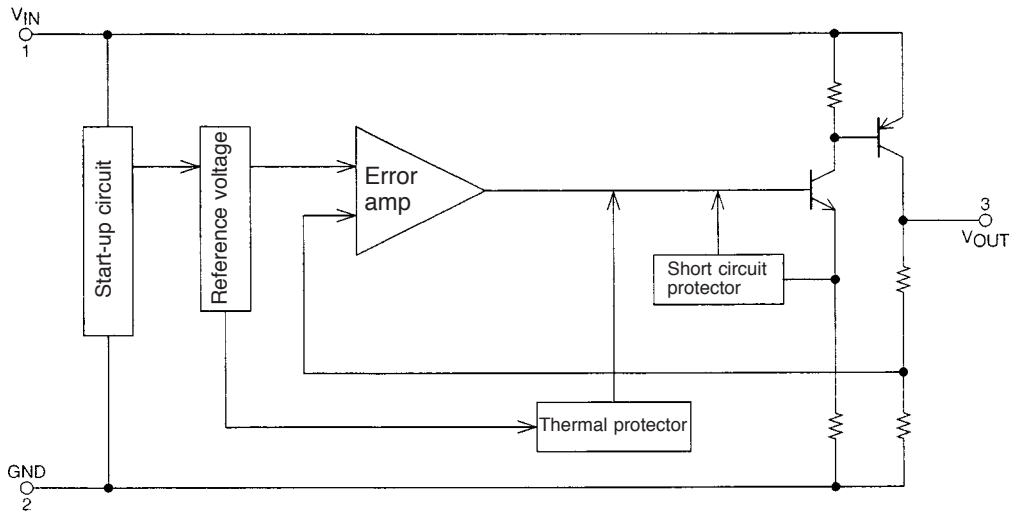
Package name
TP3H

○ Through Hole Area

\*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

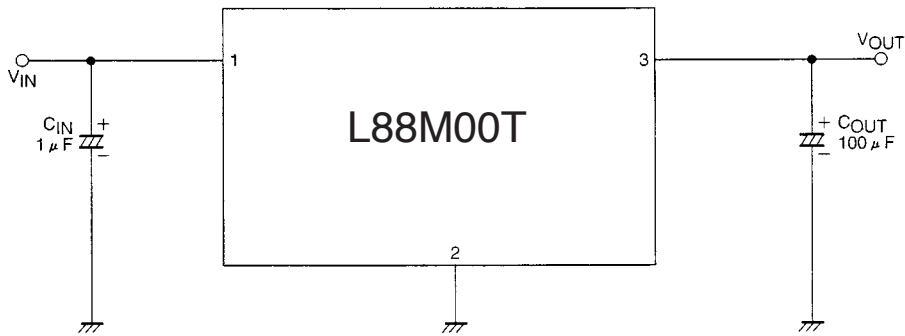
## L88M00T Series

### Equivalent Circuit Block Diagram (Common to L88M00T Series)



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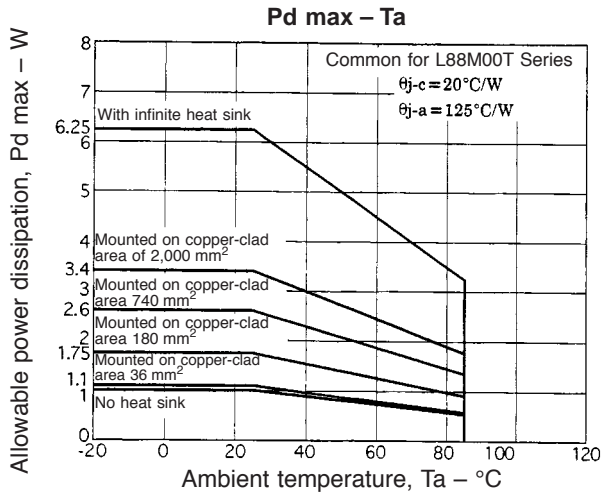
### Test Circuit (Common to L88M00T Series)



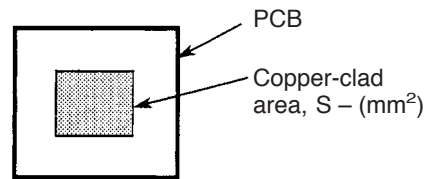
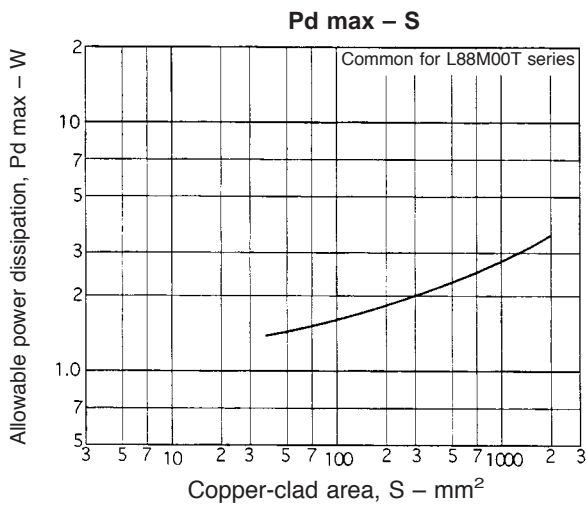
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- Notes:
1. To ensure operational stability,  $C_{IN}$  and  $C_{OUT}$  should be placed as close to the IC as possible.
  2. Because the output capacitor  $C_{OUT}$  is set at over  $100 \mu\text{F}$  to prevent oscillation at low temperatures, a capacitor that exhibits little change in capacity with temperature variations should be used (such as a tantalum capacitor).
  3. When  $V_{IN}$  is minus (-) and GND is plus (+) (reversed connection), excessive current flow will occur.

## L88M00T Series

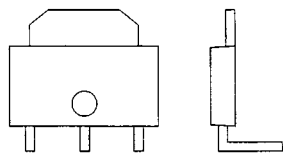


- 1) The allowable power dissipation is 1.0 W ( $T_a = 25^\circ\text{C}$ ) with no fin attached, but when mounted on a hybrid IC board or printed circuit board, high allowable power dissipation is achieved, despite the compact package. The graph below depicts the relationship between the copper-clad area and allowable power dissipation when mounted on a glass epoxy board ( $50 \times 50 \times 0.8 \text{ mm}^3$ ) with a copper thickness of  $18 \mu\text{m}$ .



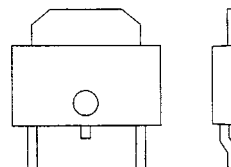
- 2) Pd is the value for when the solder on the surface of the IC heat sink has melted completely and the surface mount is horizontal.
- 3) Please be advised that the flow solder application system (full-heat method) cannot be recommended.

### Lead Formings



LR forming

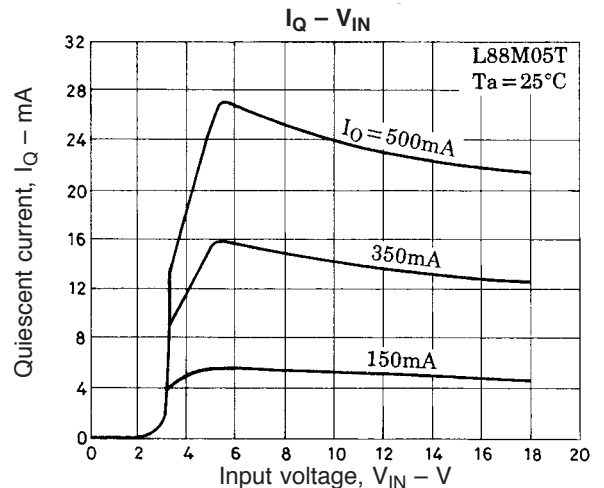
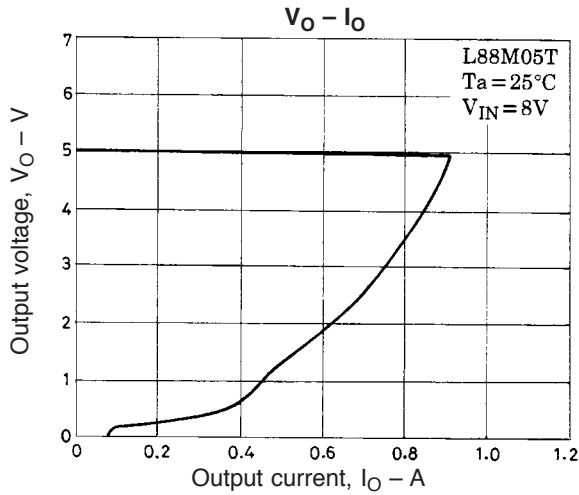
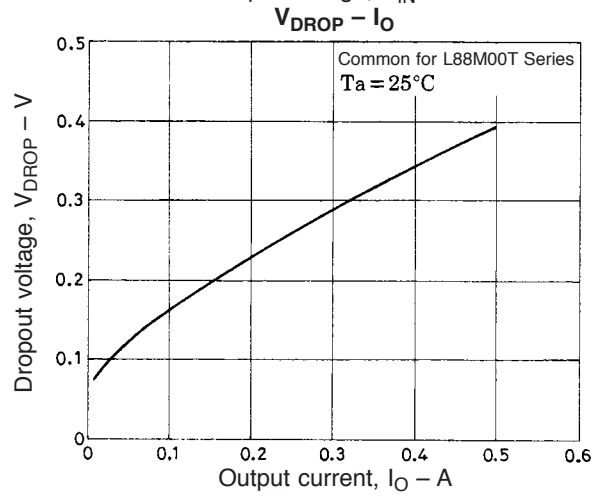
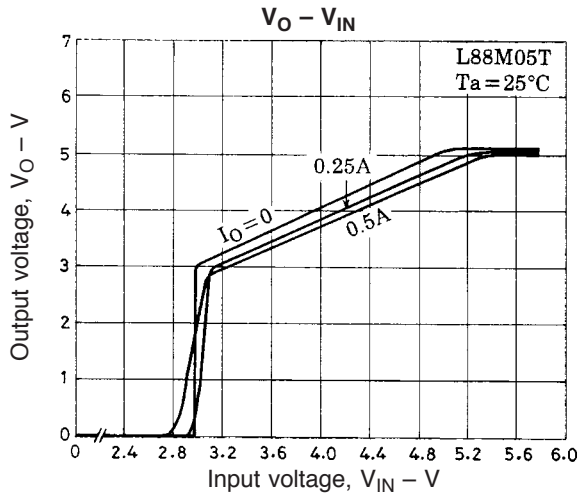
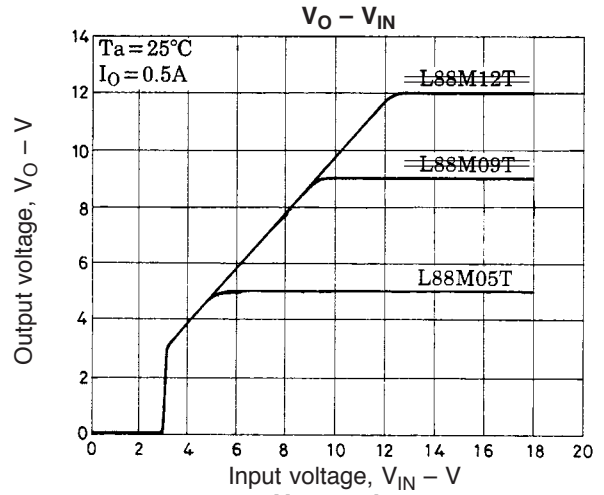
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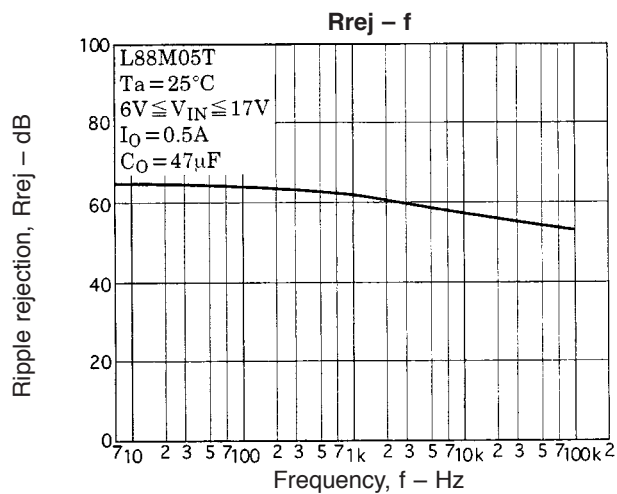
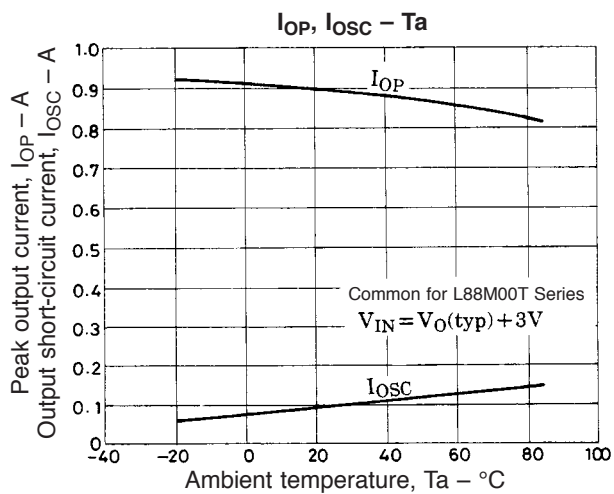
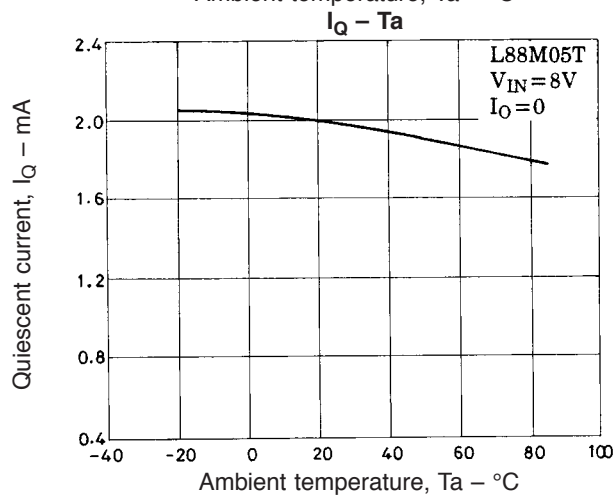
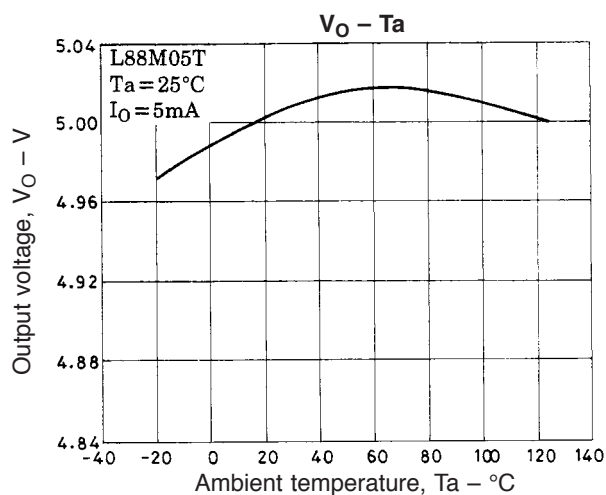
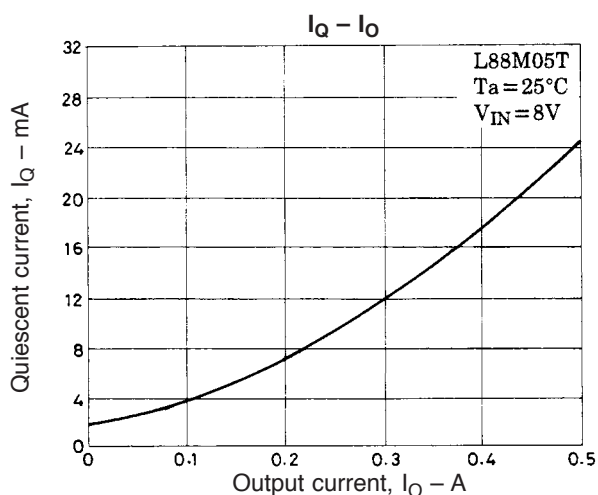
FA forming

A10246

# L88M00T Series



# L88M00T Series



# L88M05T



## ORDERING INFORMATION

Device	Package	Shipping (Qty / Packing)
L88M05T-E	TP3H (Pb-Free)	500 / Bulk Bag
L88M05TL-FA-E	TP3H (Pb-Free)	500 / Bulk Bag
L88M05TLL-E	TP3H (Pb-Free)	500 / Bulk Bag
L88M05TL-LR-E	TP3H (Pb-Free)	500 / Bulk Bag
L88M05TL-TL-E	TP3H (Pb-Free)	700 / Tape & Reel
L88M05T-TL-E	TP3H (Pb-Free)	700 / Tape & Reel

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