

LP3470 Tiny Power On Reset Circuit

Check for Samples: [LP3470](#)

FEATURES

- Tiny SOT23-5 Package
- Open Drain $\overline{\text{Reset}}$ Output
- Programmable Reset Timeout Period Using an External Capacitor
- Immune to Short V_{CC} Transients

APPLICATIONS

- Critical μP and μC Power Monitoring
- Intelligent Instruments
- Computers
- Portable/Battery-Powered Equipments

DESCRIPTION

The LP3470 is a micropower CMOS voltage supervisory circuit designed to monitor power supplies in microprocessor (μP) and other digital systems. It provides maximum adjustability for power-on-reset (POR) and supervisory functions. It is available in the following six standard reset threshold voltage (V_{RTH}) options: 2.63V, 2.93V, 3.08V, 3.65V, 4.00V, 4.38V, and 4.63V. If other voltage options between 2.4V and 5.0V are desired please contact your National Semiconductor representative.

The LP3470 asserts a reset signal whenever the V_{CC} supply voltage falls below a reset threshold. The reset time-out period is adjustable using an external capacitor. Reset remains asserted for an interval (programmed by an external capacitor) after V_{CC} has risen above the threshold voltage.

The device is available in the tiny SOT23-5 package.

Table 1. Key Specifications

$\pm 1\%$ Reset Threshold Accuracy Over Temperature
Standard Reset Threshold Voltages: 2.63V, 2.93V, 3.08V, 3.65V, 4.00V, 4.38V, and 4.63V
Custom Reset Threshold Voltages: For other voltages between 2.4V and 5.0V contact your National Semiconductor representative
Very Low Quiescent Current (16 μA typical)
Guaranteed $\overline{\text{Reset}}$ valid down to $V_{CC}=0.5\text{V}$

Pin Configuration and Basic Operating Circuit

Pin Configuration

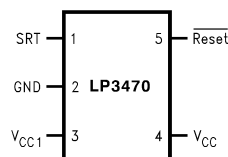


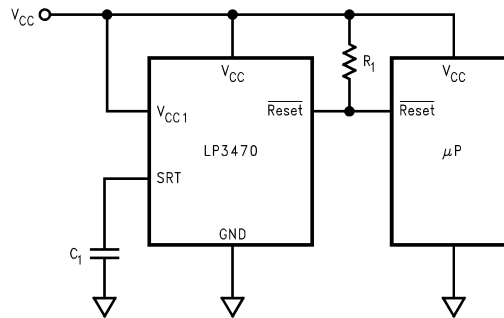
Figure 1. Top View
See NS Package Number
MF05A



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Figure 2. Basic Operating Circuit



These devices have limited built-in ESD protection. The leads should be shorted together or the device placed in conductive foam during storage or handling to prevent electrostatic damage to the MOS gates.

Absolute Maximum Ratings ⁽¹⁾

V _{CC} Voltage	-0.3V to +6V
Reset Voltage	-0.3V to +6V
Output Current ($\overline{\text{Reset}}$)	10 mA
Operating Temperature Range	
LP3470	-20°C to +85°C
LP3470I	-40°C to +85°C
Junction Temperature (T _{Jmax})	125°C
Power Dissipation (T _A = 25°C) ⁽²⁾	300 mW
θ _{JA} ⁽²⁾	280°C/W
Storage Temp. Range	-65°C to +150°C
Lead Temp. (Soldering, 5 sec)	260°C
ESD Rating ⁽³⁾	2 kV

- (1) Absolute Maximum Ratings indicate limits beyond which damage to the device may occur. Electrical specifications do not apply when operating the device beyond its operating conditions.
- (2) The maximum power dissipation must be derated at elevated temperatures and is dictated by T_{Jmax} (Maximum Junction Temperature), θ_{JA} (Junction to Ambient Thermal Resistance), and T_A (Ambient Temperature). The maximum allowable power dissipation at any temperature is P_{Dmax} = (T_{Jmax} - T_A) / θ_{JA} or the number given in the Absolute Maximum Ratings, whichever is lower.
- (3) The Human Body Model is a 100 pF capacitor discharged through a 1.5 kΩ resistor into each pin.

Electrical Characteristics

Limits in standard typeface are for $T_J = 25^\circ\text{C}$, and limits in **boldface** type apply over the full operating temperature range, unless otherwise specified. $V_{CC} = +2.4\text{V}$ to $+5.0\text{V}$ unless otherwise noted.

Symbol	Parameter	Conditions	Typ ⁽¹⁾	Min ⁽²⁾	Max ⁽²⁾	Units
V_{CC}	Operating Voltage Range			0.5	5.5	V
I_{CC}	V_{CC} Supply Current	$V_{CC} = 4.5\text{V}$	16		30	μA
V_{RTH}	Reset Threshold Voltage ⁽³⁾	LP3470	V_{RTH}	0.99 V_{RTH} 0.99 V_{RTH}	1.01 V_{RTH} 1.01 V_{RTH}	V
		LP3470I	V_{RTH}	0.99 V_{RTH} 0.985 V_{RTH}	1.01 V_{RTH} 1.015 V_{RTH}	
V_{HYST}	Hysteresis Voltage ⁽⁴⁾		35	15	65	mV
t_{PD}	V_{CC} to Reset Delay	V_{CC} falling at $1\text{ mV}/\mu\text{s}$	100		300	μs
t_{RP}	Reset Timeout Period ⁽⁵⁾	$C_1 = 1\text{ nF}$	2	1.0	3.5	ms
V_{OL}	Reset Output Voltage Low	$V_{CC} = 0.5\text{V}; I_{OL} = 30\text{ }\mu\text{A}$			0.1	V
		$V_{CC} = 1.0\text{V}; I_{OL} = 100\text{ }\mu\text{A}$			0.1	
		$V_{CC} = V_{RTH} - 100\text{ mV}; I_{OL} = 4\text{ mA}$			0.4	
R_1	External Pull-up Resistor		20	0.68	68	k Ω
I_{LEAK}	Reset Output Leakage Current		0.15		1	μA
				6		

(1) Typical numbers are at 25°C and represent the most likely parametric norm.

(2) Min. and Max. limits in standard typeface are 100% production tested at 25°C . Min. and Max. limits in boldface are guaranteed through correlation using Statistical Quality Control (SQC) methods. The limits are used to calculate National's Average Outgoing Quality Level (AOQL).

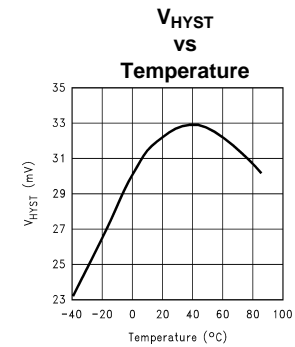
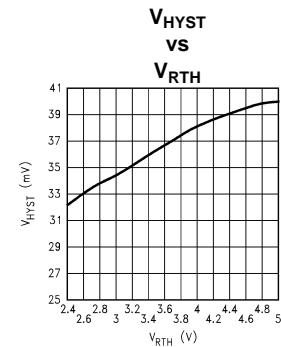
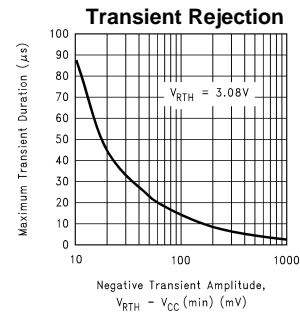
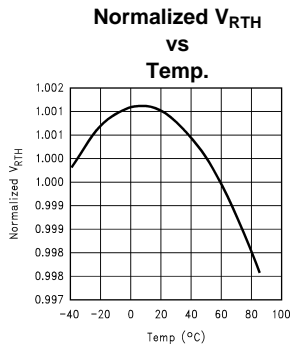
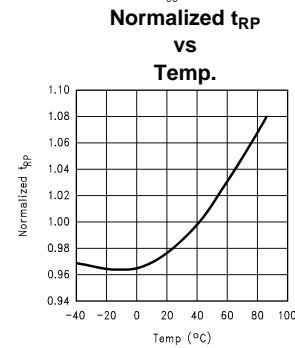
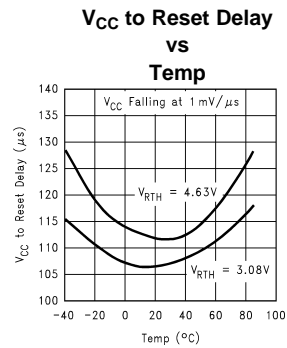
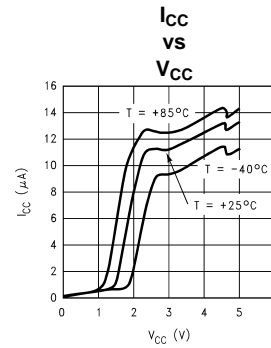
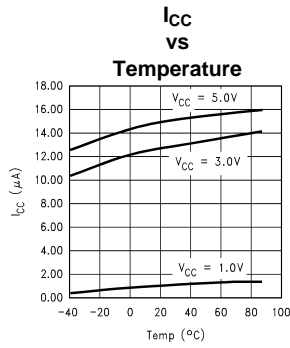
(3) Factory-trimmed reset thresholds are available in 50 mV increments from 2.4V to 5.0V. Contact your National Semiconductor representative.

(4) V_{HYST} affects the relation between V_{CC} and $\overline{\text{Reset}}$ as shown in the timing diagram.

(5) t_{RP} is programmable by varying the value of the external capacitor (C_1) connected to pin SRT. The equation is: $t_{RP} = 2000 \times C_1$ (C_1 in μF and t_{RP} in ms).

Typical Operating Characteristics

$T_A = +25^\circ\text{C}$, unless otherwise specified.

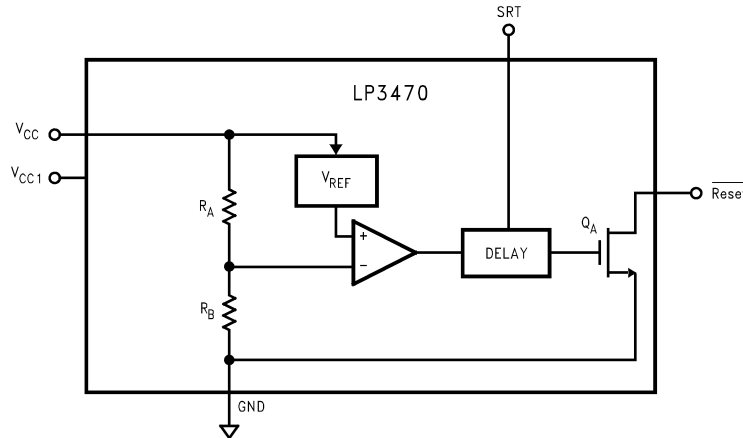


Pin Descriptions

Pin	Name	Function
1	SRT	Set Reset Time-out Input. Connect a capacitor between this input and ground to select the Reset Time-out period (t _{RP}). t _{RP} = 2000 × C ₁ (C ₁ in μF and t _{RP} in ms). If no capacitor is connected, leave this pin floating.
2	GND	Ground pin.
3	V _{CC1}	Always connect to pin V _{CC} (Pin 4).

Pin	Name	Function
4	V_{CC}	Supply voltage, and reset threshold monitor input.
5	$\overline{\text{Reset}}$	Open-Drain, Active-Low reset output. Connect to an external pull-up resistor. $\overline{\text{Reset}}$ changes from high to low whenever the monitored voltage (V_{CC}) drops below the reset threshold voltage (V_{RTH}). Once V_{CC} exceeds V_{RTH} , $\overline{\text{Reset}}$ remains low for the reset timeout period (t_{RP}) and then goes high.

Functional Block Diagram



Application Information

RESET TIMEOUT PERIOD

The Reset Timeout Period (t_{RP}) is programmable using an external capacitor (C_1) connected to pin SRT of LP3470. A Ceramic chip capacitor rated at or above 10V is sufficient. The Reset Timeout Period (t_{RP}) can be calculated using the following formula:

$$t_{RP} \text{ (ms)} = 2000 \times C_1 \text{ (\mu F)} \quad (1)$$

For example a C_1 of 100 nF will achieve a t_{RP} of 200 ms. If no delay due to t_{RP} is needed in a certain application, the pin SRT should be left floating.

RESET OUTPUT

In applications like microprocessor (μP) systems, errors might occur in system operation during power-up, power-down, or brownout conditions. It is imperative to monitor the power supply voltage in order to prevent these errors from occurring.

The LP3470 asserts a reset signal whenever the V_{CC} supply voltage is below a threshold (V_{RTH}) voltage. $\overline{\text{Reset}}$ is guaranteed to be a logic low for $V_{CC} > 0.5V$. Once V_{CC} exceeds the reset threshold, the reset is kept asserted for a time period (t_{RP}) programmed by an external capacitor (C_1); after this interval $\overline{\text{Reset}}$ goes to logic high. If a brownout condition occurs (monitored voltage falls below the reset threshold minus a small hysteresis), $\overline{\text{Reset}}$ goes low. When V_{CC} returns above the reset threshold, $\overline{\text{Reset}}$ remains low for a time period t_{RP} before going to high.

PULL-UP RESISTOR SELECTION

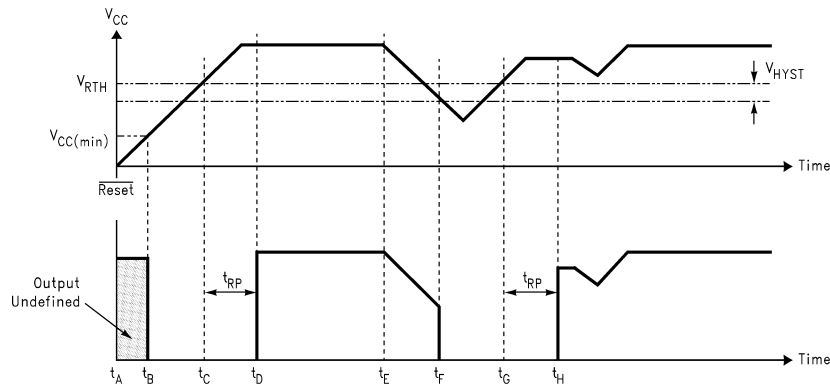
The LP3470's $\overline{\text{Reset}}$ output structure is a simple open-drain N-channel MOSFET switch. A pull-up resistor (R_1) should be connected to V_{CC} .

R_1 should be large enough to limit the current through the output MOSFET (Q_1) below 10 mA. A resistor value of more than 680 Ω guarantees this. R_1 should also be small enough to ensure a logic high while supplying all the leakage current through the Reset pin. A resistor value of less than 68k Ω satisfies this condition. A typical pull-up resistor value of 20 k Ω is sufficient in most applications.

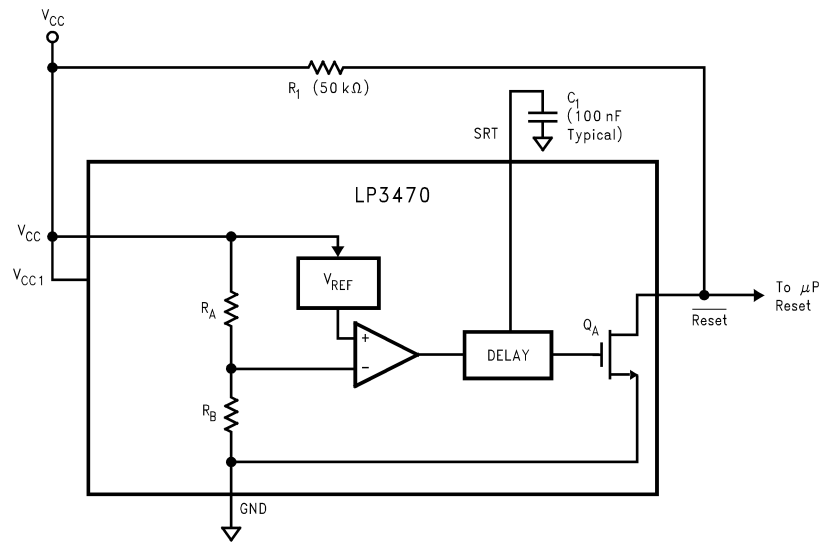
NEGATIVE-GOING V_{CC} TRANSIENTS

The LP3470 is relatively immune to short duration negative-going V_{CC} transients (glitches). The Typical Operating Characteristics show the Maximum Transient Duration vs. Negative Transient Amplitude (graph titled Transient Rejection), for which reset pulses are not generated. This graph shows the maximum pulse width a negative-going V_{CC} transient may typically have without causing a reset pulse to be issued. As the transient amplitude increases (i.e. goes farther below the reset threshold), the maximum allowable pulse width decreases. A 0.1 μF bypass capacitor mounted close to V_{CC} provides additional transient immunity.

Timing Diagram



Typical Application Circuit



PACKAGING INFORMATION

Orderable Device	Status (1)	Package Type	Package Drawing	Pins	Package Qty	Eco Plan (2)	Lead/Ball Finish	MSL Peak Temp (3)	Samples (Requires Login)
LP3470IM5-2.63	ACTIVE	SOT-23	DBV	5	1000	TBD	CU SNPB	Level-1-260C-UNLIM	
LP3470IM5-2.63/NOPB	ACTIVE	SOT-23	DBV	5	1000	Green (RoHS & no Sb/Br)	CU SN	Level-1-260C-UNLIM	
LP3470IM5-2.75	ACTIVE	SOT-23	DBV	5	1000	TBD	CU SNPB	Level-1-260C-UNLIM	
LP3470IM5-2.75/NOPB	ACTIVE	SOT-23	DBV	5	1000	Green (RoHS & no Sb/Br)	CU SN	Level-1-260C-UNLIM	
LP3470IM5-2.83	ACTIVE	SOT-23	DBV	5	1000	TBD	CU SNPB	Level-1-260C-UNLIM	
LP3470IM5-2.83/NOPB	ACTIVE	SOT-23	DBV	5	1000	Green (RoHS & no Sb/Br)	CU SN	Level-1-260C-UNLIM	
LP3470IM5-2.93	ACTIVE	SOT-23	DBV	5	1000	TBD	CU SNPB	Level-1-260C-UNLIM	
LP3470IM5-2.93/NOPB	ACTIVE	SOT-23	DBV	5	1000	Green (RoHS & no Sb/Br)	CU SN	Level-1-260C-UNLIM	
LP3470IM5-3.08	ACTIVE	SOT-23	DBV	5	1000	TBD	CU SNPB	Level-1-260C-UNLIM	
LP3470IM5-3.08/NOPB	ACTIVE	SOT-23	DBV	5	1000	Green (RoHS & no Sb/Br)	CU SN	Level-1-260C-UNLIM	
LP3470IM5-3.65	ACTIVE	SOT-23	DBV	5	1000	TBD	CU SNPB	Level-1-260C-UNLIM	
LP3470IM5-3.65/NOPB	ACTIVE	SOT-23	DBV	5	1000	Green (RoHS & no Sb/Br)	CU SN	Level-1-260C-UNLIM	
LP3470IM5-4.00	ACTIVE	SOT-23	DBV	5	1000	TBD	CU SNPB	Level-1-260C-UNLIM	
LP3470IM5-4.00/NOPB	ACTIVE	SOT-23	DBV	5	1000	Green (RoHS & no Sb/Br)	CU SN	Level-1-260C-UNLIM	
LP3470IM5-4.38	ACTIVE	SOT-23	DBV	5	1000	TBD	CU SNPB	Level-1-260C-UNLIM	
LP3470IM5-4.38/NOPB	ACTIVE	SOT-23	DBV	5	1000	Green (RoHS & no Sb/Br)	CU SN	Level-1-260C-UNLIM	
LP3470IM5-4.63	ACTIVE	SOT-23	DBV	5	1000	TBD	CU SNPB	Level-1-260C-UNLIM	
LP3470IM5-4.63/NOPB	ACTIVE	SOT-23	DBV	5	1000	Green (RoHS & no Sb/Br)	CU SN	Level-1-260C-UNLIM	
LP3470IM5-4.8	ACTIVE	SOT-23	DBV	5	1000	TBD	CU SNPB	Level-1-260C-UNLIM	
LP3470IM5-4.8/NOPB	ACTIVE	SOT-23	DBV	5	1000	Green (RoHS & no Sb/Br)	CU SN	Level-1-260C-UNLIM	
LP3470IM5X-2.63	ACTIVE	SOT-23	DBV	5	3000	TBD	CU SNPB	Level-1-260C-UNLIM	
LP3470IM5X-2.63/NOPB	ACTIVE	SOT-23	DBV	5	3000	Green (RoHS & no Sb/Br)	CU SN	Level-1-260C-UNLIM	

Orderable Device	Status (1)	Package Type	Package Drawing	Pins	Package Qty	Eco Plan (2)	Lead/Ball Finish	MSL Peak Temp (3)	Samples (Requires Login)
LP3470IM5X-2.83	ACTIVE	SOT-23	DBV	5	3000	TBD	CU SNPB	Level-1-260C-UNLIM	
LP3470IM5X-2.83/NOPB	ACTIVE	SOT-23	DBV	5	3000	Green (RoHS & no Sb/Br)	CU SN	Level-1-260C-UNLIM	
LP3470IM5X-2.93	ACTIVE	SOT-23	DBV	5	3000	TBD	CU SNPB	Level-1-260C-UNLIM	
LP3470IM5X-2.93/NOPB	ACTIVE	SOT-23	DBV	5	3000	Green (RoHS & no Sb/Br)	CU SN	Level-1-260C-UNLIM	
LP3470IM5X-3.08	ACTIVE	SOT-23	DBV	5	3000	TBD	CU SNPB	Level-1-260C-UNLIM	
LP3470IM5X-3.08/NOPB	ACTIVE	SOT-23	DBV	5	3000	Green (RoHS & no Sb/Br)	CU SN	Level-1-260C-UNLIM	
LP3470IM5X-4.00	ACTIVE	SOT-23	DBV	5	3000	TBD	CU SNPB	Level-1-260C-UNLIM	
LP3470IM5X-4.00/NOPB	ACTIVE	SOT-23	DBV	5	3000	Green (RoHS & no Sb/Br)	CU SN	Level-1-260C-UNLIM	
LP3470IM5X-4.38	ACTIVE	SOT-23	DBV	5	3000	TBD	CU SNPB	Level-1-260C-UNLIM	
LP3470IM5X-4.38/NOPB	ACTIVE	SOT-23	DBV	5	3000	Green (RoHS & no Sb/Br)	CU SN	Level-1-260C-UNLIM	
LP3470IM5X-4.63	ACTIVE	SOT-23	DBV	5	3000	TBD	CU SNPB	Level-1-260C-UNLIM	
LP3470IM5X-4.63/NOPB	ACTIVE	SOT-23	DBV	5	3000	Green (RoHS & no Sb/Br)	CU SN	Level-1-260C-UNLIM	
LP3470M5-2.63	ACTIVE	SOT-23	DBV	5	1000	TBD	CU SNPB	Level-1-260C-UNLIM	
LP3470M5-2.63/NOPB	ACTIVE	SOT-23	DBV	5	1000	Green (RoHS & no Sb/Br)	CU SN	Level-1-260C-UNLIM	
LP3470M5-2.93	ACTIVE	SOT-23	DBV	5	1000	TBD	CU SNPB	Level-1-260C-UNLIM	
LP3470M5-2.93/NOPB	ACTIVE	SOT-23	DBV	5	1000	Green (RoHS & no Sb/Br)	CU SN	Level-1-260C-UNLIM	
LP3470M5-3.08	ACTIVE	SOT-23	DBV	5	1000	TBD	CU SNPB	Level-1-260C-UNLIM	
LP3470M5-3.08/NOPB	ACTIVE	SOT-23	DBV	5	1000	Green (RoHS & no Sb/Br)	CU SN	Level-1-260C-UNLIM	
LP3470M5-4.00	ACTIVE	SOT-23	DBV	5	1000	TBD	CU SNPB	Level-1-260C-UNLIM	
LP3470M5-4.00/NOPB	ACTIVE	SOT-23	DBV	5	1000	Green (RoHS & no Sb/Br)	CU SN	Level-1-260C-UNLIM	
LP3470M5-4.38	ACTIVE	SOT-23	DBV	5	1000	TBD	CU SNPB	Level-1-260C-UNLIM	
LP3470M5-4.38/NOPB	ACTIVE	SOT-23	DBV	5	1000	Green (RoHS & no Sb/Br)	CU SN	Level-1-260C-UNLIM	
LP3470M5-4.63	ACTIVE	SOT-23	DBV	5	1000	TBD	CU SNPB	Level-1-260C-UNLIM	

Orderable Device	Status (1)	Package Type	Package Drawing	Pins	Package Qty	Eco Plan (2)	Lead/Ball Finish	MSL Peak Temp (3)	Samples (Requires Login)
LP3470M5-4.63/NOPB	ACTIVE	SOT-23	DBV	5	1000	Green (RoHS & no Sb/Br)	CU SN	Level-1-260C-UNLIM	
LP3470M5X-2.93	ACTIVE	SOT-23	DBV	5	3000	TBD	CU SNPB	Level-1-260C-UNLIM	
LP3470M5X-2.93/NOPB	ACTIVE	SOT-23	DBV	5	3000	Green (RoHS & no Sb/Br)	CU SN	Level-1-260C-UNLIM	
LP3470M5X-3.08	ACTIVE	SOT-23	DBV	5	3000	TBD	CU SNPB	Level-1-260C-UNLIM	
LP3470M5X-3.08/NOPB	ACTIVE	SOT-23	DBV	5	3000	Green (RoHS & no Sb/Br)	CU SN	Level-1-260C-UNLIM	
LP3470M5X-4.00	ACTIVE	SOT-23	DBV	5	3000	TBD	CU SNPB	Level-1-260C-UNLIM	
LP3470M5X-4.00/NOPB	ACTIVE	SOT-23	DBV	5	3000	Green (RoHS & no Sb/Br)	CU SN	Level-1-260C-UNLIM	
LP3470M5X-4.63	ACTIVE	SOT-23	DBV	5	3000	TBD	CU SNPB	Level-1-260C-UNLIM	
LP3470M5X-4.63/NOPB	ACTIVE	SOT-23	DBV	5	3000	Green (RoHS & no Sb/Br)	CU SN	Level-1-260C-UNLIM	

(1) The marketing status values are defined as follows:

ACTIVE: Product device recommended for new designs.

LIFEBUY: TI has announced that the device will be discontinued, and a lifetime-buy period is in effect.

NRND: Not recommended for new designs. Device is in production to support existing customers, but TI does not recommend using this part in a new design.

PREVIEW: Device has been announced but is not in production. Samples may or may not be available.

OBSELETE: TI has discontinued the production of the device.

(2) Eco Plan - The planned eco-friendly classification: Pb-Free (RoHS), Pb-Free (RoHS Exempt), or Green (RoHS & no Sb/Br) - please check <http://www.ti.com/productcontent> for the latest availability information and additional product content details.

TBD: The Pb-Free/Green conversion plan has not been defined.

Pb-Free (RoHS): TI's terms "Lead-Free" or "Pb-Free" mean semiconductor products that are compatible with the current RoHS requirements for all 6 substances, including the requirement that lead not exceed 0.1% by weight in homogeneous materials. Where designed to be soldered at high temperatures, TI Pb-Free products are suitable for use in specified lead-free processes.

Pb-Free (RoHS Exempt): This component has a RoHS exemption for either 1) lead-based flip-chip solder bumps used between the die and package, or 2) lead-based die adhesive used between the die and leadframe. The component is otherwise considered Pb-Free (RoHS compatible) as defined above.

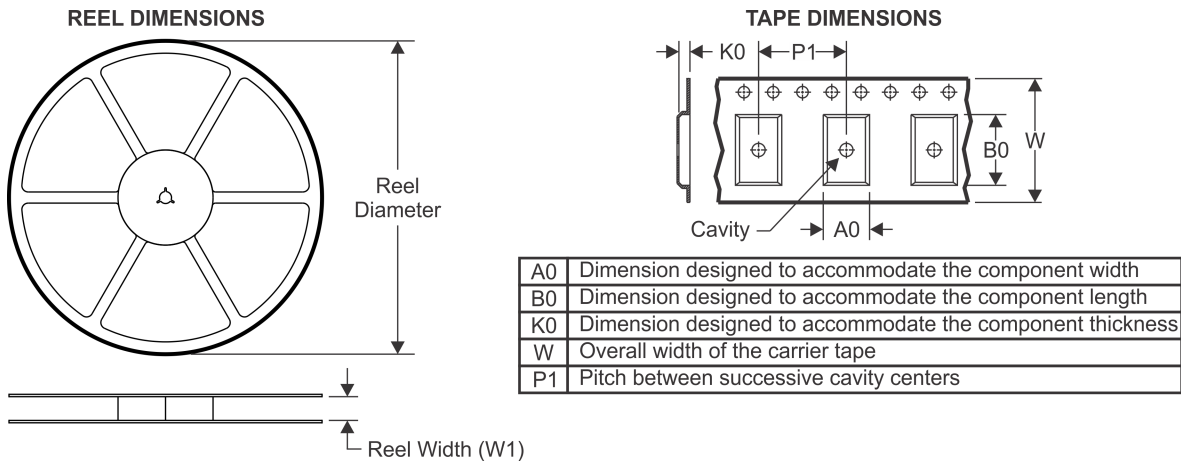
Green (RoHS & no Sb/Br): TI defines "Green" to mean Pb-Free (RoHS compatible), and free of Bromine (Br) and Antimony (Sb) based flame retardants (Br or Sb do not exceed 0.1% by weight in homogeneous material)

(3) MSL, Peak Temp. -- The Moisture Sensitivity Level rating according to the JEDEC industry standard classifications, and peak solder temperature.

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TAPE AND REEL INFORMATION



QUADRANT ASSIGNMENTS FOR PIN 1 ORIENTATION IN TAPE



*All dimensions are nominal

Device	Package Type	Package Drawing	Pins	SPQ	Reel Diameter (mm)	Reel Width W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P1 (mm)	W (mm)	Pin1 Quadrant
LP3470IM5-2.63	SOT-23	DBV	5	1000	178.0	8.4	3.2	3.2	1.4	4.0	8.0	Q3
LP3470IM5-2.63/NOPB	SOT-23	DBV	5	1000	178.0	8.4	3.2	3.2	1.4	4.0	8.0	Q3
LP3470IM5-2.75	SOT-23	DBV	5	1000	178.0	8.4	3.2	3.2	1.4	4.0	8.0	Q3
LP3470IM5-2.75/NOPB	SOT-23	DBV	5	1000	178.0	8.4	3.2	3.2	1.4	4.0	8.0	Q3
LP3470IM5-2.83	SOT-23	DBV	5	1000	178.0	8.4	3.2	3.2	1.4	4.0	8.0	Q3
LP3470IM5-2.83/NOPB	SOT-23	DBV	5	1000	178.0	8.4	3.2	3.2	1.4	4.0	8.0	Q3
LP3470IM5-2.93	SOT-23	DBV	5	1000	178.0	8.4	3.2	3.2	1.4	4.0	8.0	Q3
LP3470IM5-2.93/NOPB	SOT-23	DBV	5	1000	178.0	8.4	3.2	3.2	1.4	4.0	8.0	Q3
LP3470IM5-3.08	SOT-23	DBV	5	1000	178.0	8.4	3.2	3.2	1.4	4.0	8.0	Q3
LP3470IM5-3.08/NOPB	SOT-23	DBV	5	1000	178.0	8.4	3.2	3.2	1.4	4.0	8.0	Q3
LP3470IM5-3.65	SOT-23	DBV	5	1000	178.0	8.4	3.2	3.2	1.4	4.0	8.0	Q3
LP3470IM5-3.65/NOPB	SOT-23	DBV	5	1000	178.0	8.4	3.2	3.2	1.4	4.0	8.0	Q3
LP3470IM5-4.00	SOT-23	DBV	5	1000	178.0	8.4	3.2	3.2	1.4	4.0	8.0	Q3
LP3470IM5-4.00/NOPB	SOT-23	DBV	5	1000	178.0	8.4	3.2	3.2	1.4	4.0	8.0	Q3
LP3470IM5-4.38	SOT-23	DBV	5	1000	178.0	8.4	3.2	3.2	1.4	4.0	8.0	Q3
LP3470IM5-4.38/NOPB	SOT-23	DBV	5	1000	178.0	8.4	3.2	3.2	1.4	4.0	8.0	Q3
LP3470IM5-4.63	SOT-23	DBV	5	1000	178.0	8.4	3.2	3.2	1.4	4.0	8.0	Q3
LP3470IM5-4.63/NOPB	SOT-23	DBV	5	1000	178.0	8.4	3.2	3.2	1.4	4.0	8.0	Q3

Device	Package Type	Package Drawing	Pins	SPQ	Reel Diameter (mm)	Reel Width W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P1 (mm)	W (mm)	Pin1 Quadrant
LP3470IM5-4.8	SOT-23	DBV	5	1000	178.0	8.4	3.2	3.2	1.4	4.0	8.0	Q3
LP3470IM5-4.8/NOPB	SOT-23	DBV	5	1000	178.0	8.4	3.2	3.2	1.4	4.0	8.0	Q3
LP3470IM5X-2.63	SOT-23	DBV	5	3000	178.0	8.4	3.2	3.2	1.4	4.0	8.0	Q3
LP3470IM5X-2.63/NOPB	SOT-23	DBV	5	3000	178.0	8.4	3.2	3.2	1.4	4.0	8.0	Q3
LP3470IM5X-2.83	SOT-23	DBV	5	3000	178.0	8.4	3.2	3.2	1.4	4.0	8.0	Q3
LP3470IM5X-2.83/NOPB	SOT-23	DBV	5	3000	178.0	8.4	3.2	3.2	1.4	4.0	8.0	Q3
LP3470IM5X-2.93	SOT-23	DBV	5	3000	178.0	8.4	3.2	3.2	1.4	4.0	8.0	Q3
LP3470IM5X-2.93/NOPB	SOT-23	DBV	5	3000	178.0	8.4	3.2	3.2	1.4	4.0	8.0	Q3
LP3470IM5X-3.08	SOT-23	DBV	5	3000	178.0	8.4	3.2	3.2	1.4	4.0	8.0	Q3
LP3470IM5X-3.08/NOPB	SOT-23	DBV	5	3000	178.0	8.4	3.2	3.2	1.4	4.0	8.0	Q3
LP3470IM5X-4.00	SOT-23	DBV	5	3000	178.0	8.4	3.2	3.2	1.4	4.0	8.0	Q3
LP3470IM5X-4.00/NOPB	SOT-23	DBV	5	3000	178.0	8.4	3.2	3.2	1.4	4.0	8.0	Q3
LP3470IM5X-4.38	SOT-23	DBV	5	3000	178.0	8.4	3.2	3.2	1.4	4.0	8.0	Q3
LP3470IM5X-4.38/NOPB	SOT-23	DBV	5	3000	178.0	8.4	3.2	3.2	1.4	4.0	8.0	Q3
LP3470IM5X-4.63	SOT-23	DBV	5	3000	178.0	8.4	3.2	3.2	1.4	4.0	8.0	Q3
LP3470IM5X-4.63/NOPB	SOT-23	DBV	5	3000	178.0	8.4	3.2	3.2	1.4	4.0	8.0	Q3
LP3470M5-2.63	SOT-23	DBV	5	1000	178.0	8.4	3.2	3.2	1.4	4.0	8.0	Q3
LP3470M5-2.63/NOPB	SOT-23	DBV	5	1000	178.0	8.4	3.2	3.2	1.4	4.0	8.0	Q3
LP3470M5-2.93	SOT-23	DBV	5	1000	178.0	8.4	3.2	3.2	1.4	4.0	8.0	Q3
LP3470M5-2.93/NOPB	SOT-23	DBV	5	1000	178.0	8.4	3.2	3.2	1.4	4.0	8.0	Q3
LP3470M5-3.08	SOT-23	DBV	5	1000	178.0	8.4	3.2	3.2	1.4	4.0	8.0	Q3
LP3470M5-3.08/NOPB	SOT-23	DBV	5	1000	178.0	8.4	3.2	3.2	1.4	4.0	8.0	Q3
LP3470M5-4.00	SOT-23	DBV	5	1000	178.0	8.4	3.2	3.2	1.4	4.0	8.0	Q3
LP3470M5-4.00/NOPB	SOT-23	DBV	5	1000	178.0	8.4	3.2	3.2	1.4	4.0	8.0	Q3
LP3470M5-4.38	SOT-23	DBV	5	1000	178.0	8.4	3.2	3.2	1.4	4.0	8.0	Q3
LP3470M5-4.38/NOPB	SOT-23	DBV	5	1000	178.0	8.4	3.2	3.2	1.4	4.0	8.0	Q3
LP3470M5-4.63	SOT-23	DBV	5	1000	178.0	8.4	3.2	3.2	1.4	4.0	8.0	Q3
LP3470M5-4.63/NOPB	SOT-23	DBV	5	1000	178.0	8.4	3.2	3.2	1.4	4.0	8.0	Q3
LP3470M5X-2.93	SOT-23	DBV	5	3000	178.0	8.4	3.2	3.2	1.4	4.0	8.0	Q3
LP3470M5X-2.93/NOPB	SOT-23	DBV	5	3000	178.0	8.4	3.2	3.2	1.4	4.0	8.0	Q3
LP3470M5X-3.08	SOT-23	DBV	5	3000	178.0	8.4	3.2	3.2	1.4	4.0	8.0	Q3
LP3470M5X-3.08/NOPB	SOT-23	DBV	5	3000	178.0	8.4	3.2	3.2	1.4	4.0	8.0	Q3
LP3470M5X-4.00	SOT-23	DBV	5	3000	178.0	8.4	3.2	3.2	1.4	4.0	8.0	Q3
LP3470M5X-4.00/NOPB	SOT-23	DBV	5	3000	178.0	8.4	3.2	3.2	1.4	4.0	8.0	Q3
LP3470M5X-4.63	SOT-23	DBV	5	3000	178.0	8.4	3.2	3.2	1.4	4.0	8.0	Q3
LP3470M5X-4.63/NOPB	SOT-23	DBV	5	3000	178.0	8.4	3.2	3.2	1.4	4.0	8.0	Q3

TAPE AND REEL BOX DIMENSIONS

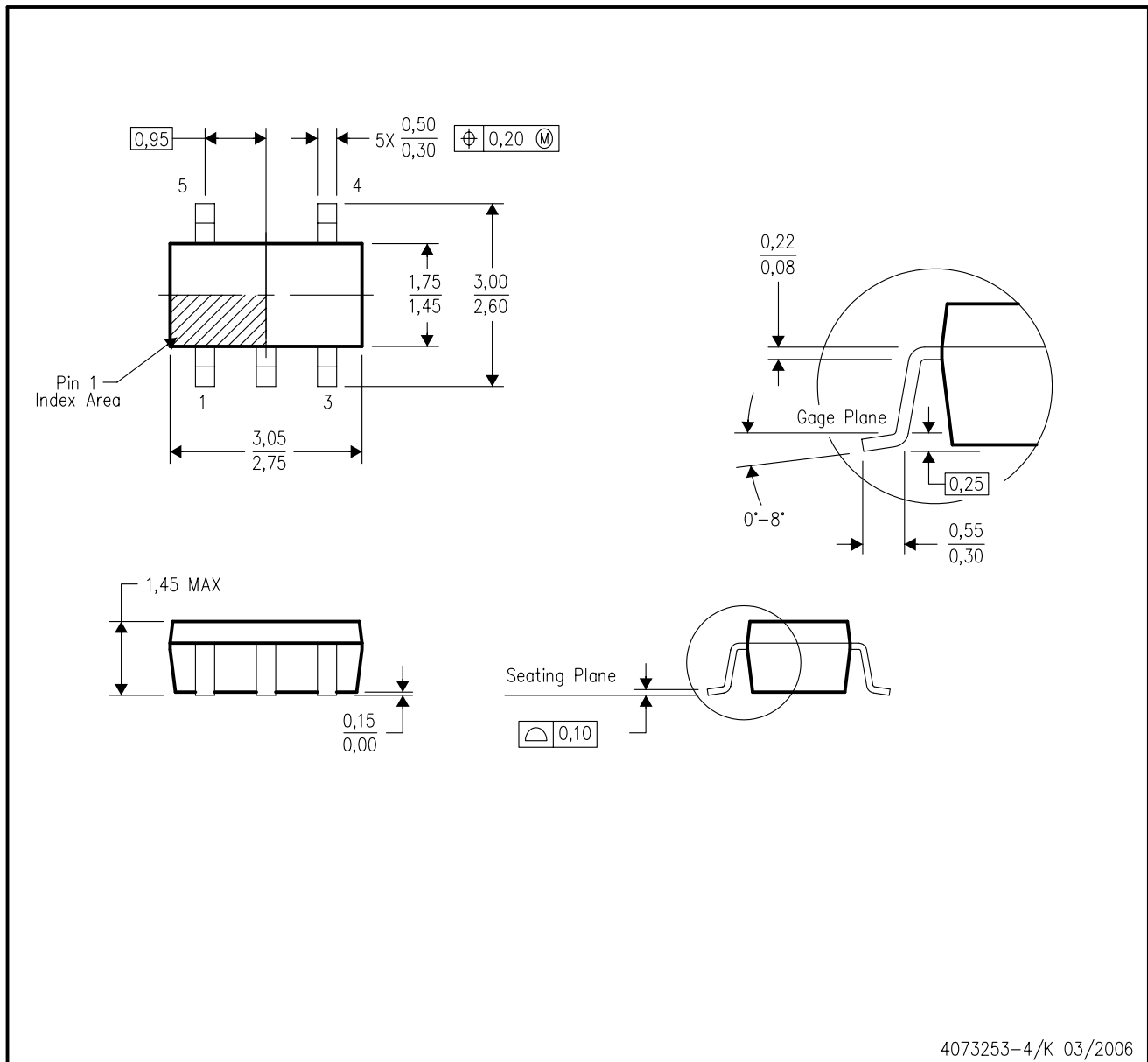

*All dimensions are nominal

Device	Package Type	Package Drawing	Pins	SPQ	Length (mm)	Width (mm)	Height (mm)
LP3470IM5-2.63	SOT-23	DBV	5	1000	203.0	190.0	41.0
LP3470IM5-2.63/NOPB	SOT-23	DBV	5	1000	203.0	190.0	41.0
LP3470IM5-2.75	SOT-23	DBV	5	1000	203.0	190.0	41.0
LP3470IM5-2.75/NOPB	SOT-23	DBV	5	1000	203.0	190.0	41.0
LP3470IM5-2.83	SOT-23	DBV	5	1000	203.0	190.0	41.0
LP3470IM5-2.83/NOPB	SOT-23	DBV	5	1000	203.0	190.0	41.0
LP3470IM5-2.93	SOT-23	DBV	5	1000	203.0	190.0	41.0
LP3470IM5-2.93/NOPB	SOT-23	DBV	5	1000	203.0	190.0	41.0
LP3470IM5-3.08	SOT-23	DBV	5	1000	203.0	190.0	41.0
LP3470IM5-3.08/NOPB	SOT-23	DBV	5	1000	203.0	190.0	41.0
LP3470IM5-3.65	SOT-23	DBV	5	1000	203.0	190.0	41.0
LP3470IM5-3.65/NOPB	SOT-23	DBV	5	1000	203.0	190.0	41.0
LP3470IM5-4.00	SOT-23	DBV	5	1000	203.0	190.0	41.0
LP3470IM5-4.00/NOPB	SOT-23	DBV	5	1000	203.0	190.0	41.0
LP3470IM5-4.38	SOT-23	DBV	5	1000	203.0	190.0	41.0
LP3470IM5-4.38/NOPB	SOT-23	DBV	5	1000	203.0	190.0	41.0
LP3470IM5-4.63	SOT-23	DBV	5	1000	203.0	190.0	41.0
LP3470IM5-4.63/NOPB	SOT-23	DBV	5	1000	203.0	190.0	41.0
LP3470IM5-4.8	SOT-23	DBV	5	1000	203.0	190.0	41.0
LP3470IM5-4.8/NOPB	SOT-23	DBV	5	1000	203.0	190.0	41.0

Device	Package Type	Package Drawing	Pins	SPQ	Length (mm)	Width (mm)	Height (mm)
LP3470IM5X-2.63	SOT-23	DBV	5	3000	206.0	191.0	90.0
LP3470IM5X-2.63/NOPB	SOT-23	DBV	5	3000	206.0	191.0	90.0
LP3470IM5X-2.83	SOT-23	DBV	5	3000	206.0	191.0	90.0
LP3470IM5X-2.83/NOPB	SOT-23	DBV	5	3000	206.0	191.0	90.0
LP3470IM5X-2.93	SOT-23	DBV	5	3000	206.0	191.0	90.0
LP3470IM5X-2.93/NOPB	SOT-23	DBV	5	3000	206.0	191.0	90.0
LP3470IM5X-3.08	SOT-23	DBV	5	3000	206.0	191.0	90.0
LP3470IM5X-3.08/NOPB	SOT-23	DBV	5	3000	206.0	191.0	90.0
LP3470IM5X-4.00	SOT-23	DBV	5	3000	206.0	191.0	90.0
LP3470IM5X-4.00/NOPB	SOT-23	DBV	5	3000	206.0	191.0	90.0
LP3470IM5X-4.38	SOT-23	DBV	5	3000	206.0	191.0	90.0
LP3470IM5X-4.38/NOPB	SOT-23	DBV	5	3000	206.0	191.0	90.0
LP3470IM5X-4.63	SOT-23	DBV	5	3000	206.0	191.0	90.0
LP3470IM5X-4.63/NOPB	SOT-23	DBV	5	3000	206.0	191.0	90.0
LP3470M5-2.63	SOT-23	DBV	5	1000	203.0	190.0	41.0
LP3470M5-2.63/NOPB	SOT-23	DBV	5	1000	203.0	190.0	41.0
LP3470M5-2.93	SOT-23	DBV	5	1000	203.0	190.0	41.0
LP3470M5-2.93/NOPB	SOT-23	DBV	5	1000	203.0	190.0	41.0
LP3470M5-3.08	SOT-23	DBV	5	1000	203.0	190.0	41.0
LP3470M5-3.08/NOPB	SOT-23	DBV	5	1000	203.0	190.0	41.0
LP3470M5-4.00	SOT-23	DBV	5	1000	203.0	190.0	41.0
LP3470M5-4.00/NOPB	SOT-23	DBV	5	1000	203.0	190.0	41.0
LP3470M5-4.38	SOT-23	DBV	5	1000	203.0	190.0	41.0
LP3470M5-4.38/NOPB	SOT-23	DBV	5	1000	203.0	190.0	41.0
LP3470M5-4.63	SOT-23	DBV	5	1000	203.0	190.0	41.0
LP3470M5-4.63/NOPB	SOT-23	DBV	5	1000	203.0	190.0	41.0
LP3470M5X-2.93	SOT-23	DBV	5	3000	206.0	191.0	90.0
LP3470M5X-2.93/NOPB	SOT-23	DBV	5	3000	206.0	191.0	90.0
LP3470M5X-3.08	SOT-23	DBV	5	3000	206.0	191.0	90.0
LP3470M5X-3.08/NOPB	SOT-23	DBV	5	3000	206.0	191.0	90.0
LP3470M5X-4.00	SOT-23	DBV	5	3000	206.0	191.0	90.0
LP3470M5X-4.00/NOPB	SOT-23	DBV	5	3000	206.0	191.0	90.0
LP3470M5X-4.63	SOT-23	DBV	5	3000	206.0	191.0	90.0
LP3470M5X-4.63/NOPB	SOT-23	DBV	5	3000	206.0	191.0	90.0

DBV (R-PDSO-G5)

PLASTIC SMALL-OUTLINE PACKAGE



- NOTES:
- All linear dimensions are in millimeters.
 - This drawing is subject to change without notice.
 - Body dimensions do not include mold flash or protrusion. Mold flash and protrusion shall not exceed 0.15 per side.
 - Falls within JEDEC MO-178 Variation AA.

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