

TOWER SEMICONDUCTOR LTD.

1,250,000 Ordinary Shares

Pursuant to this prospectus supplement, the accompanying Prospectus Supplement No. 1 and the accompanying base prospectus, we are offering 1,250,000 ordinary shares to YA Global Master SPV Ltd., or YA Global, at a price of \$1.00 per share, pursuant to our previously announced Standby Equity Purchase Agreement, or SEPA, dated August 11, 2009 and amended August 27, 2009, with YA Global. The shares are being issued as part of the commitment by YA Global to purchase from time to time, at our option, up to \$25,000,000 of our ordinary shares pursuant to the SEPA as described in Prospectus Supplement No. 1. We expect to issue the shares to YA Global against payment therefor on or about September 9, 2009.

In addition to our issuance of ordinary shares to YA Global pursuant to the SEPA, this prospectus supplement, the accompanying Prospectus Supplement No. 1 and the accompanying base prospectus also cover the resale of those shares by YA Global to the public. YA Global may be deemed to be an "underwriter" within the meaning of the Securities Act of 1933, as amended.

Our ordinary shares are quoted on the NASDAQ Global Market and the Tel-Aviv Stock Exchange under the symbol "TSEM." On September 4, 2009, the last reported sales prices of our ordinary shares on the NASDAQ Global Market was \$0.98 and on September 7, 2009 the last reported sales prices of our ordinary shares on the Tel-Aviv Stock Exchange was NIS 3.604 per share. After giving effect to the issuance of the shares and payment therefor as described in this prospectus supplement, YA Global will have purchased an aggregate of 1,992,215 of our ordinary shares in consideration for advances in the aggregate amount of \$2,150,815 under the SEPA.

Investing in our securities involves a high degree of risk. See "Risk Factors" included and referred to beginning on page S-3 of the accompanying Prospectus Supplement No. 1.

Neither the Securities and Exchange Commission nor any state securities commission has approved or disapproved of these securities or passed upon the adequacy or accuracy of this prospectus supplement or the accompanying base prospectus. Any representation to the contrary is a criminal offense.

The date of this prospectus supplement is September 8, 2009.

THE OFFERING

Securities offered	1,250,000 ordinary shares of Tower Semiconductor Ltd.
Purchaser	YA Global Master SPV Ltd., pursuant to the Standby Equity Purchase Agreement dated August 11, 2009 and amended on August 27, 2009.
Purchase price	\$1.00
Settlement date	On or about September 9, 2009.
Use of proceeds	We intend to use the net proceeds from this offering for working capital and other general corporate purposes. See "Use of Proceeds" in the accompanying Prospectus Supplement No. 1.
Symbol for Ordinary Shares on Nasdaq Global Market and Tel-Aviv Stock Exchange	TSEM
Resale	This prospectus supplement, the accompanying Prospectus Supplement No. 1 and the accompanying base prospectus also cover the resale of shares by YA Global to the public. See "Plan of Distribution" in the accompanying Prospectus Supplement No. 1.

PLAN OF DISTRIBUTION

On August 11 2009, we entered into a Standby Equity Purchase Agreement with YA Global. We entered into an amendment of the Standby Equity Purchase Agreement, or SEPA, on August 27, 2009. The SEPA provides that, upon the terms and subject to the conditions set forth therein, YA Global is committed to purchase up to \$25 million of our ordinary shares over a two-year commitment period. From time to time, and at our sole discretion, we may present YA Global with advance notices to purchase our ordinary shares. For each ordinary share purchased under the SEPA, YA Global will pay 97% of the lowest volume weighted average price, or VWAP, of the ordinary shares on the Tel-Aviv Stock Exchange during the five trading day pricing period following the advance notice. The aggregate amount of each advance requested cannot exceed \$5,000,000, unless otherwise mutually agreed to by us and YA Global. The amount issued pursuant to any advance also cannot cause the aggregate number of ordinary shares beneficially owned by YA Global and its affiliates to exceed 4.99% of the

then outstanding ordinary shares. If an advance notice requests the purchase of shares exceeding any of these amounts, that portion of the advance notice will be deemed to be automatically withdrawn.

Promptly after the end of the five trading day period following delivery of the advance notice, we will deliver to YA Global the requisite number of shares against payment by YA Global of the advance amount requested, subject to our satisfaction of certain conditions under the SEPA. There is no arrangement for funds to be received in an escrow, trust, or similar arrangement. We may continue to deliver additional advance notices until the commitment amount is purchased or the expiration of the two-year period.

For each advance notice, we may indicate a minimum acceptable price, which cannot be more than 95% of the last closing price of our ordinary shares on the Tel-Aviv Stock Exchange at the time of delivery of the advance notice. If during the five trading day pricing period following any advance notice the VWAP for the ordinary shares is below the indicated minimum acceptable price, the amount of the advance will generally be reduced by 20% for each day the VWAP is below the minimum acceptable price and that trading day will be excluded from the pricing period for purposes of determining the purchase price.

The SEPA provides for the payment of a \$650,000 commitment fee to YA Global which may be paid either in cash, in our ordinary shares (using the VWAP on the Tel-Aviv Stock Exchange on the day immediately preceding the payment date) or some combination of cash and ordinary shares. In accordance with the SEPA, we paid \$200,000 of the commitment fee on August 19, 2009, the date of the delivery by us of the first advance notice under the SEPA by delivery of 163,742 ordinary shares to YA Global. In addition, we are required to pay \$200,000 six months following the first advance notice date and \$250,000 12 months following the first advance notice date.

3

We may terminate the SEPA upon 15 trading days' prior notice to YA Global, as long as there are no advances outstanding and we have paid to YA Global all amounts then due. A copy of the SEPA is attached as Exhibit 99.1 to our Report on Form 6-K as filed with the SEC on August 12, 2009. A copy of the Amendment No. 1 to the SEPA is attached as Exhibit 99.1 to our Report on Form 6-K as filed with the SEC on August 27, 2009.

In addition to our issuance of ordinary shares to YA Global pursuant to the SEPA, this prospectus supplement also covers the resale of those shares from time to time by YA Global to the public. In connection with YA Global's sale of our ordinary shares, YA Global may be deemed to be an "underwriter" within the meaning of the Securities Act and the compensation paid to YA Global may be deemed to be underwriting commissions or discounts. We have agreed in the SEPA to provide indemnification to YA Global against certain civil liabilities.

We will file a prospectus supplement indicating the price and number of ordinary shares issued in connection with each sale of ordinary shares under the SEPA.

YA Global has informed us that it will use an unaffiliated broker-dealer to effectuate any sales of ordinary shares that it may purchase from us pursuant to the SEPA. Such sales will be made on the NASDAQ, the Tel-Aviv Stock Exchange or otherwise at prices and at terms then prevailing or at prices related to the then current market price. Each such unaffiliated broker-dealer may be an underwriter within the meaning of Section 2(a)(11) of the Securities Act. YA Global has informed us that each such broker-dealer will receive commissions from YA Global which will not exceed customary brokerage commissions.

Our ordinary shares may be sold by YA Global in one or more of the following manners:

- ordinary brokerage transactions and transactions in which the broker solicits purchasers;
- a block trade in which the broker or dealer so engaged will attempt to sell the shares as agent, but may position and resell a portion of the block as principal to facilitate the transaction;
- to a broker-dealer as principal and resale by the broker-dealer for its account; or
- a combination of any such methods of sale.

YA Global has agreed that, during the term of the SEPA, neither YA Global nor its affiliates will engage in any short sales or hedging transactions with respect to our ordinary shares, provided that upon receipt of an advance notice YA Global may sell shares that it is obligated to purchase under such advance notice prior to taking possession of such shares.

4

YA Global and any unaffiliated broker-dealer will be subject to liability under the federal securities laws and must comply with the requirements of the Securities Act and the Exchange Act, including without limitation, Rule 10b-5 and Regulation M under the Exchange Act. These rules and regulations may limit the timing of purchases and sales of ordinary shares by YA Global or any unaffiliated broker-dealer. Under these rules and regulations, YA Global and any unaffiliated broker-dealer:

- may not engage in any stabilization activity in connection with our securities;
- must furnish each broker which offers shares of our ordinary shares covered by the prospectus that is a part of our Registration Statement with the number of copies of such prospectus and any prospectus supplement which are required by each broker; and
- may not bid for or purchase any of our securities or attempt to induce any person to purchase any of our securities other than as permitted under the Exchange Act.

These restrictions may affect the marketability of the ordinary shares by YA Global and any unaffiliated broker-dealer.

5

