



# SPP9435A P-Channel Enhancement Mode MOSFET

## DESCRIPTION

The SPP9435A is the P-Channel logic enhancement mode power field effect transistors are produced using high cell density , DMOS trench technology.

This high density process is especially tailored to minimize on-state resistance.

These devices are particularly suited for low voltage application , notebook computer power management and other battery powered circuits where high-side switching .

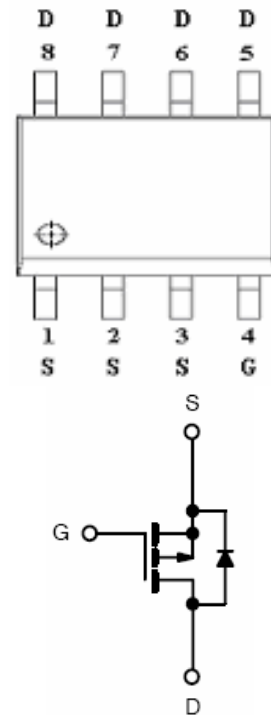
## FEATURES

- ◆ -30V/-5.3A, $R_{DS(ON)}=65m\Omega@V_{GS}=-10V$
- ◆ -30V/-4.2A, $R_{DS(ON)}=100m\Omega@V_{GS}=-4.5V$
- ◆ Super high density cell design for extremely low  $R_{DS(ON)}$
- ◆ Exceptional on-resistance and maximum DC current capability
- ◆ SOP – 8P package design

## APPLICATIONS

- Power Management in Note book
- Portable Equipment
- Battery Powered System
- DC/DC Converter
- Load Switch
- DSC
- LCD Display inverter

## PIN CONFIGURATION(SOP – 8P)



## PART MARKING





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### PIN DESCRIPTION

| Pin | Symbol | Description |
|-----|--------|-------------|
| 1   | S      | Source      |
| 2   | S      | Source      |
| 3   | S      | Source      |
| 4   | G      | Gate        |
| 5   | D      | Drain       |
| 6   | D      | Drain       |
| 7   | D      | Drain       |
| 8   | D      | Drain       |

### ORDERING INFORMATION

| Part Number  | Package | Part Marking |
|--------------|---------|--------------|
| SPP9435AS8RG | SOP- 8P | SPP9435A     |
| SPP9435AS8TG | SOP- 8P | SPP9435A     |

※ SPP9435AS8RG : 13" Tape Reel ; Pb – Free

※ SPP9435AS8TG : Tube ; Pb – Free

### ABSOLUTE MAXIMUM RATINGS

(TA=25°C Unless otherwise noted)

| Parameter                                       | Symbol           | Typical | Unit |   |
|---|------------------|---------|------|---|
| Drain-Source Voltage                            | V <sub>DSS</sub> | -30     | V    |   |
| Gate –Source Voltage                            | V <sub>GSS</sub> | ±20     | V    |   |
| Continuous Drain Current(T <sub>J</sub> =150°C) | I <sub>D</sub>   | TA=25°C | -6.8 | A |
|   |                  | TA=70°C | -4.6 |   |
| Pulsed Drain Current                            | I <sub>DM</sub>  | -30     | A    |   |
| Continuous Source Current(Diode Conduction)     | I <sub>S</sub>   | -2.3    | A    |   |
| Power Dissipation                               | P <sub>D</sub>   | TA=25°C | 2.8  | W |
|   |                  | TA=70°C | 1.8  |   |
| Operating Junction Temperature                  | T <sub>J</sub>   | -55/150 | °C   |   |
| Storage Temperature Range                       | T <sub>STG</sub> | -55/150 | °C   |   |
| Thermal Resistance-Junction to Ambient          | R <sub>θJA</sub> | 70      | °C/W |   |



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### ELECTRICAL CHARACTERISTICS

(TA=25°C Unless otherwise noted)

| Parameter                       | Symbol        | Conditions  | Min. | Typ   | Max.      | Unit     |
|---------------------------------|---------------|---|------|-------|-----------|----------|
| <b>Static</b>                   |               |   |      |       |           |          |
| Drain-Source Breakdown Voltage  | $V_{(BR)DSS}$ | $V_{GS}=0V, I_D=-250\mu A$  | -30  |       |           | V        |
| Gate Threshold Voltage          | $V_{GS(th)}$  | $V_{DS}=V_{GS}, I_D=-250\mu A$  | -1.0 |       | -3.0      |          |
| Gate Leakage Current            | $I_{GSS}$     | $V_{DS}=0V, V_{GS}=\pm 20V$   |      |       | $\pm 100$ | nA       |
| Zero Gate Voltage Drain Current | $I_{DSS}$     | $V_{DS}=-24V, V_{GS}=0V$  |      |       | -1        | uA       |
|                                 |               | $V_{DS}=-24V, V_{GS}=0V$<br>$T_J=85^\circ C$                              |      |       | -5        |          |
| On-State Drain Current          | $I_{D(on)}$   | $V_{DS}=-5V, V_{GS}=-4.5V$  | -10  |       |           | A        |
| Drain-Source On-Resistance      | $R_{DS(on)}$  | $V_{GS}=-10V, I_D=-5.3A$  |      | 0.055 | 0.065     | $\Omega$ |
|                                 |               | $V_{GS}=-4.5V, I_D=-4.2A$   |      | 0.090 | 0.100     |          |
| Forward Transconductance        | $g_{fs}$      | $V_{DS}=-15V, I_D=-5.7A$  |      | 13    |           | S        |
| Diode Forward Voltage           | $V_{SD}$      | $I_S=-2.0A, V_{GS}=0V$  |      | -0.8  | -1.2      | V        |
| <b>Dynamic</b>                  |               |   |      |       |           |          |
| Total Gate Charge               | $Q_g$         | $V_{DS}=-15V, V_{GS}=-10V$<br>$I_D=-4.6A$                                 |      | 27    | 32        | nC       |
| Gate-Source Charge              | $Q_{gs}$      |   |      | 4     |           |          |
| Gate-Drain Charge               | $Q_{gd}$      |   |      | 6.5   |           |          |
| Input Capacitance               | $C_{iss}$     | $V_{DS}=-15V, V_{GS}=0V$<br>$f=1MHz$                                      |      | 850   |           | pF       |
| Output Capacitance              | $C_{oss}$     |   |      | 150   |           |          |
| Reverse Transfer Capacitance    | $C_{rss}$     |   |      | 85    |           |          |
| Turn-On Time                    | $t_{d(on)}$   | $V_{DD}=-15V, R_L=15\Omega$<br>$I_D=-1.0A, V_{GEN}=-10V$<br>$R_G=6\Omega$ |      | 14    | 30        | nS       |
|                                 | $t_r$         |   |      | 13    | 45        |          |
| Turn-Off Time                   | $t_{d(off)}$  |   |      | 56    | 100       |          |
|                                 | $t_f$         |   |      | 30    | 90        |          |

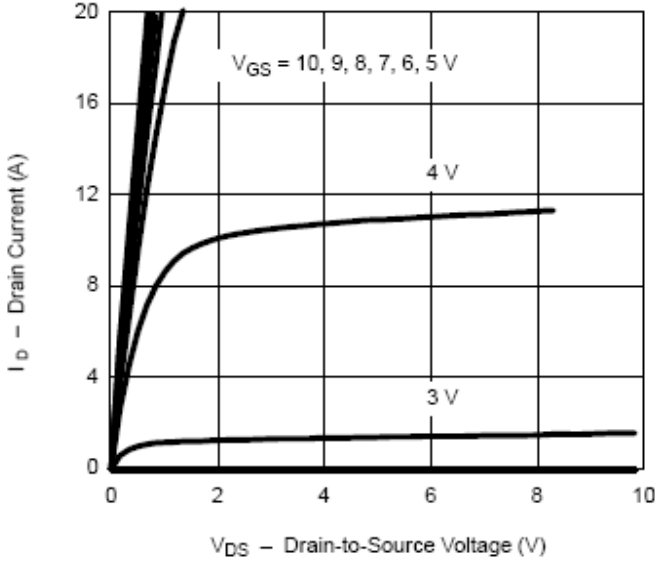


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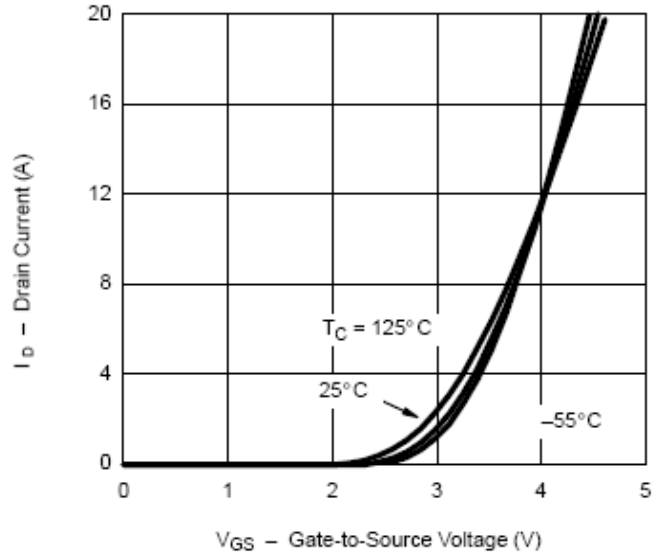
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### TYPICAL CHARACTERISTICS

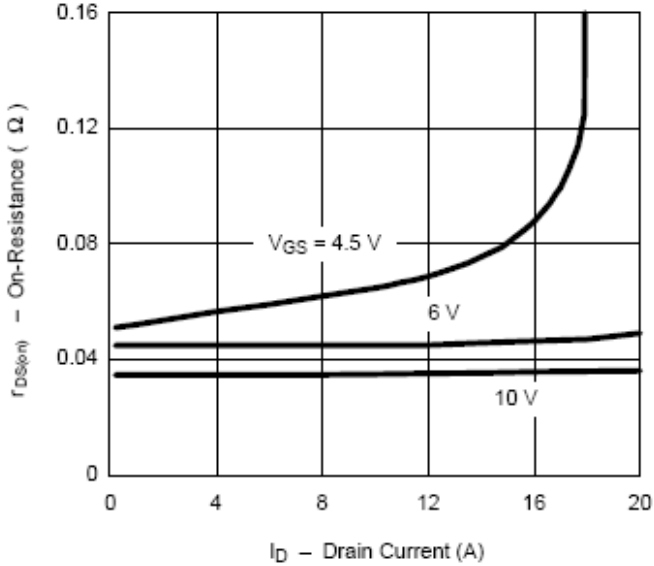
Output Characteristics



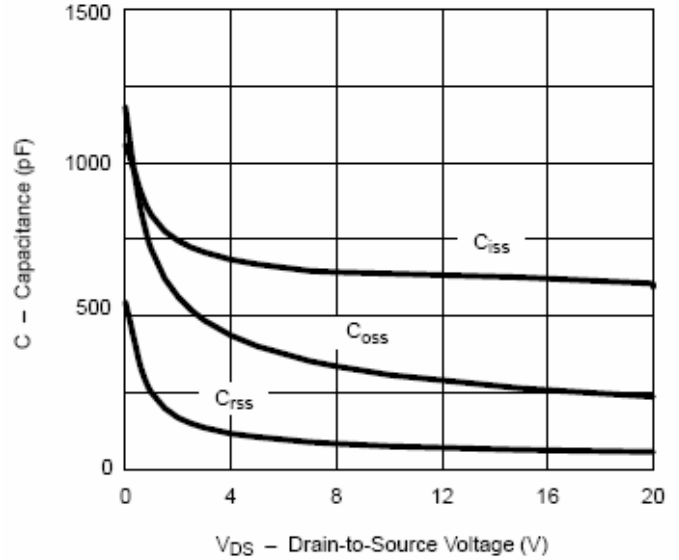
Transfer Characteristics



On-Resistance vs. Drain Current



Capacitance

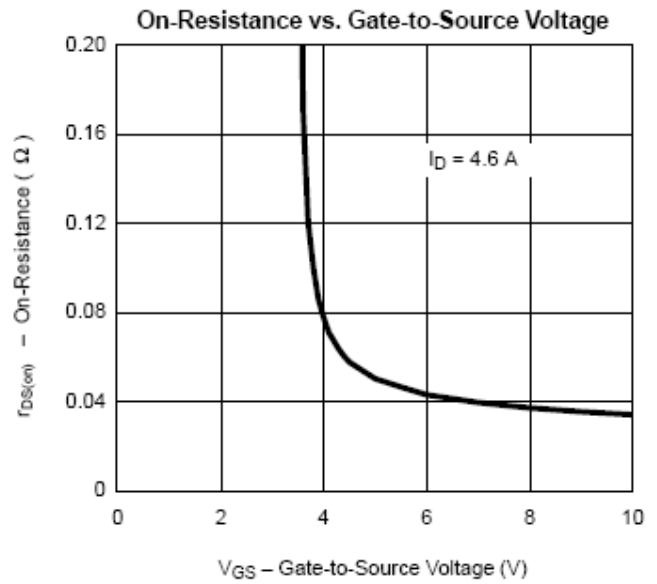
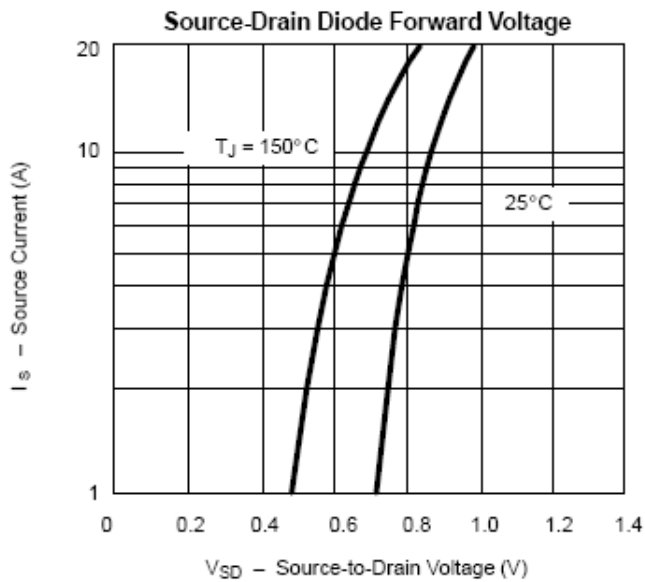
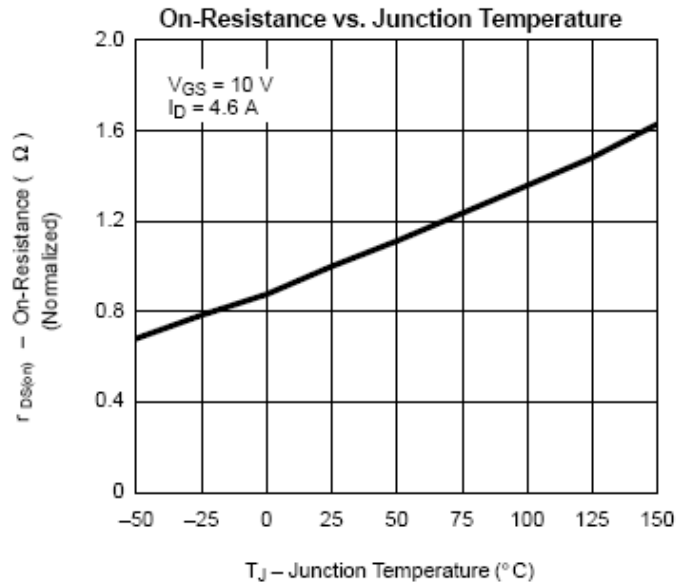
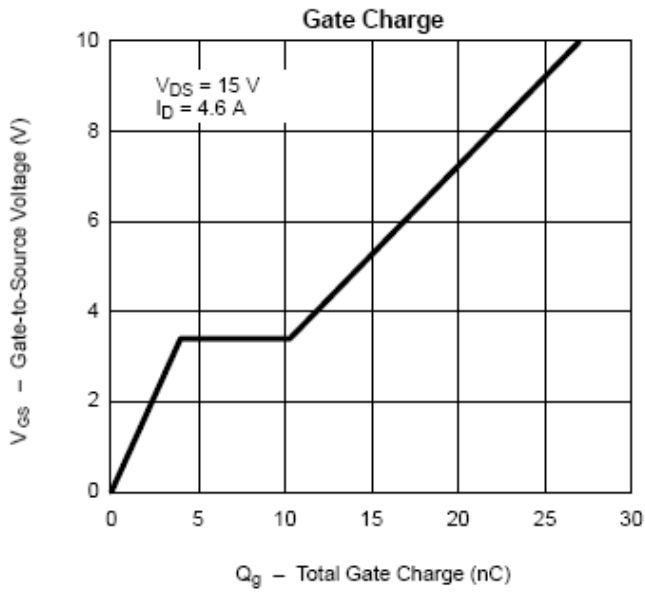




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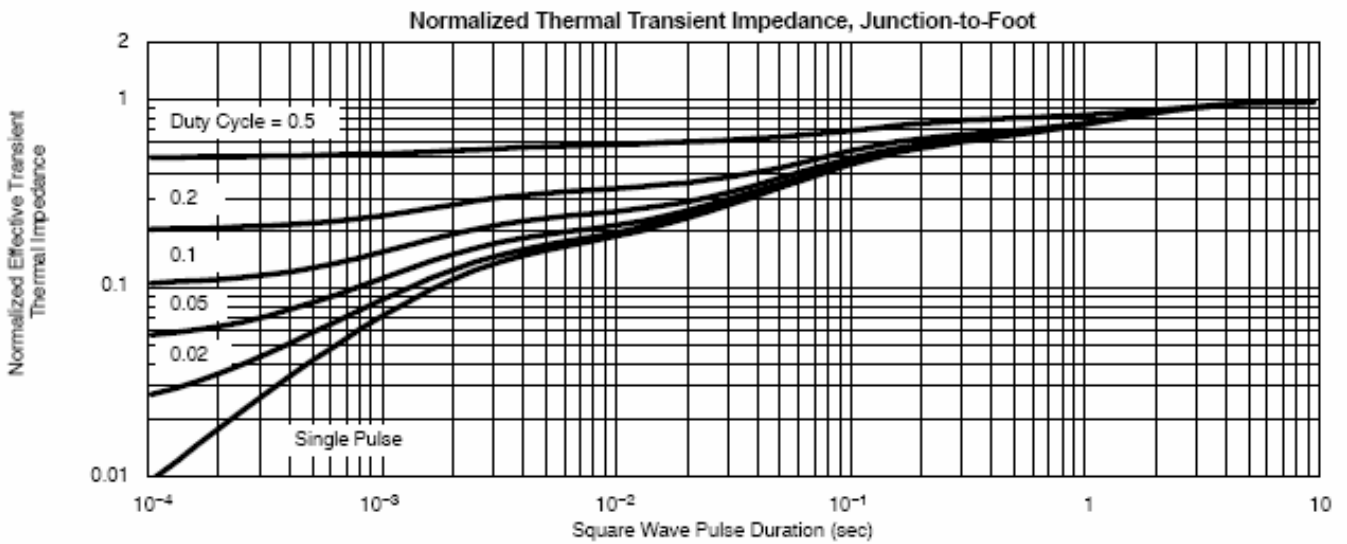
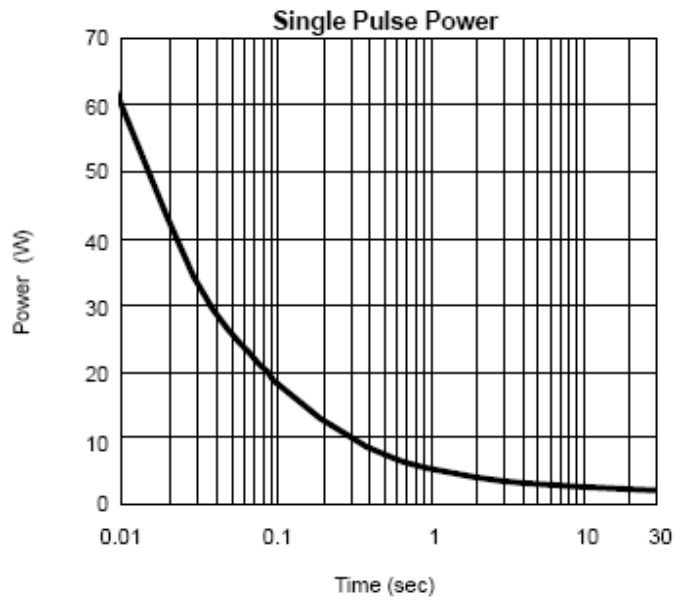
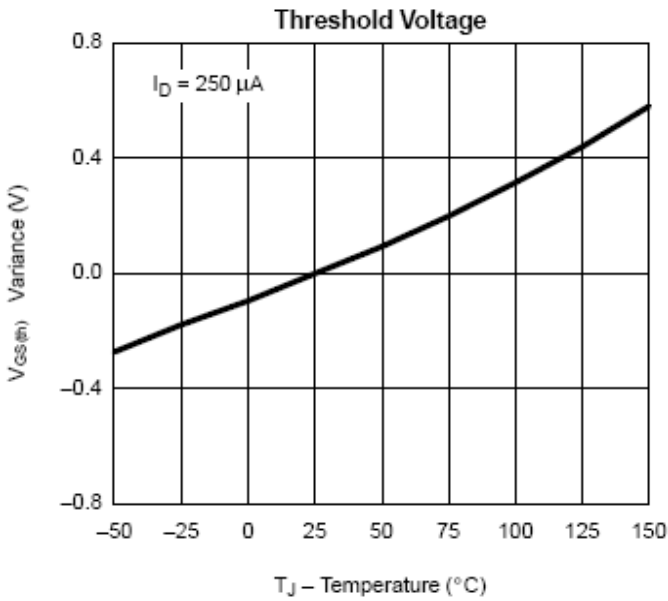




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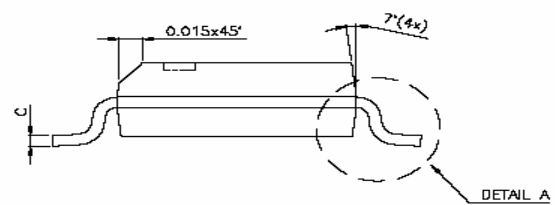
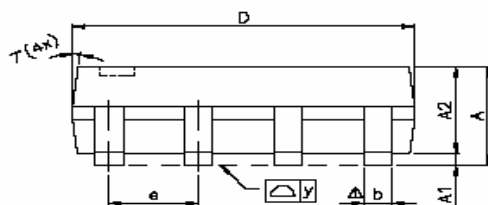
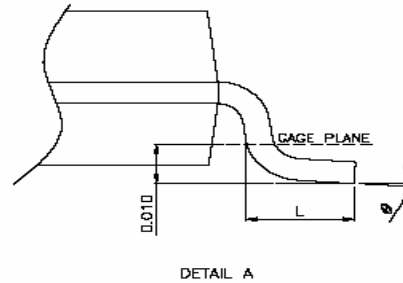
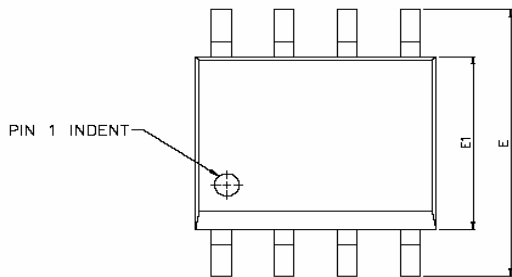




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### SOP-8 PACKAGE OUTLINE



| SYMBOLS    | DIMENSIONS IN MILLIMETERS |      |       | DIMENSIONS IN INCHES |       |        |
|------------|---------------------------|------|-------|----------------------|-------|--------|
|            | MIN                       | NOM  | MAX   | MIN                  | NOM   | MAX    |
| A          | 1.47                      | 1.60 | 1.73  | 0.058                | 0.063 | 0.068  |
| A1         | 0.10                      | —    | 0.25  | 0.004                | —     | 0.010  |
| A2         | —                         | 1.45 | —     | —                    | 0.057 | —      |
| b          | 0.33                      | 0.41 | 0.51  | 0.013                | 0.016 | 0.020  |
| C          | 0.19                      | 0.20 | 0.25  | 0.0075               | 0.008 | 0.0098 |
| D          | 4.80                      | 4.85 | 4.95  | 0.189                | 0.191 | 0.195  |
| E          | 5.80                      | 6.00 | 6.20  | 0.228                | 0.236 | 0.244  |
| E1         | 3.80                      | 3.90 | 4.00  | 0.150                | 0.154 | 0.157  |
| e          | —                         | 1.27 | —     | —                    | 0.050 | —      |
| L          | 0.38                      | 0.71 | 1.27  | 0.015                | 0.028 | 0.050  |
| $\Delta$ y | —                         | —    | 0.076 | —                    | —     | 0.003  |
| $\theta$   | 0°                        | —    | 8°    | 0°                   | —     | 8°     |



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