

### GENERAL DESCRIPTION

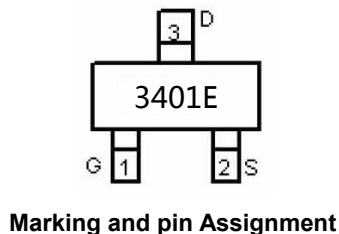
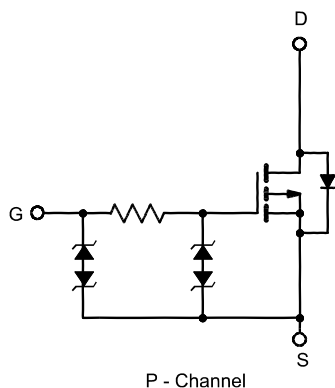
The HM3401E is the P-Channel logic enhancement mode power field effect transistors are produced using high cell density, DMOS trench technology. This high density process is especially tailored to minimize on-state resistance.

### FEATURES

- $R_{DS(ON)} = 0.30\Omega$  @  $V_{GS} = -4.5V$
- $R_{DS(ON)} = 0.40\Omega$  @  $V_{GS} = -2.5V$
- Super high density cell design for extremely low  $R_{DS(ON)}$
- Exceptional on-resistance and maximum DC current capability
- Capable doing Cu wire bonding

### APPLICATIONS

- Power Management in Note book
- Portable Equipment
- Battery Powered System



### Absolute Maximum Ratings ( $T_A = 25^\circ C$ Unless Otherwise Noted)

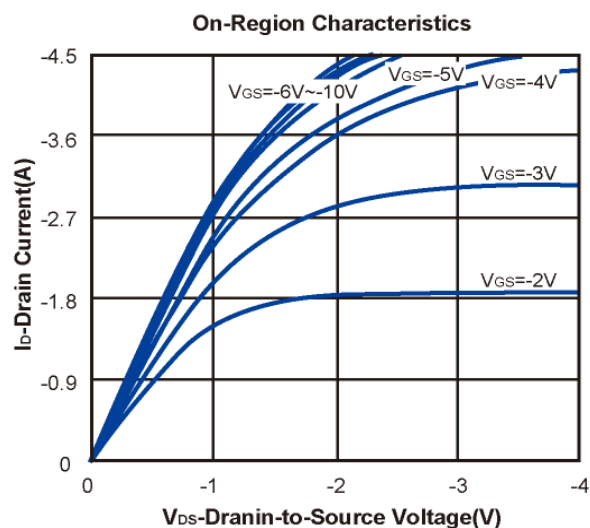
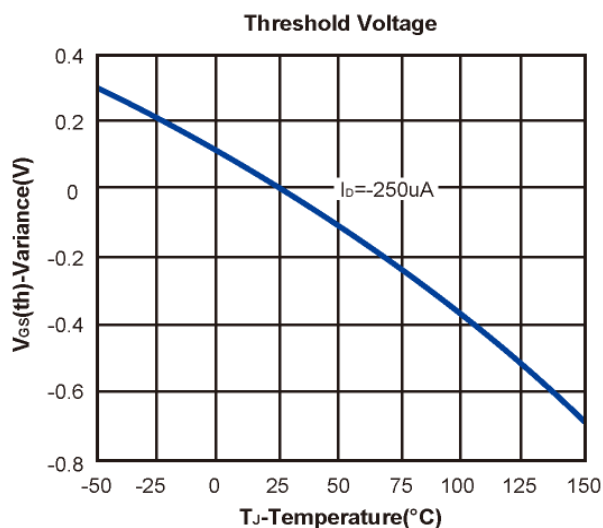
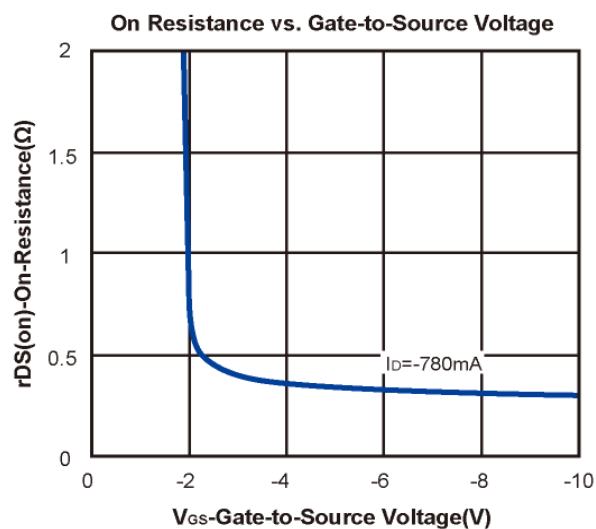
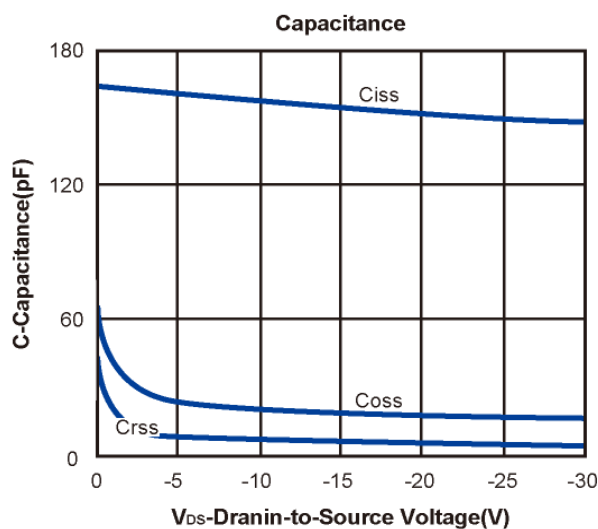
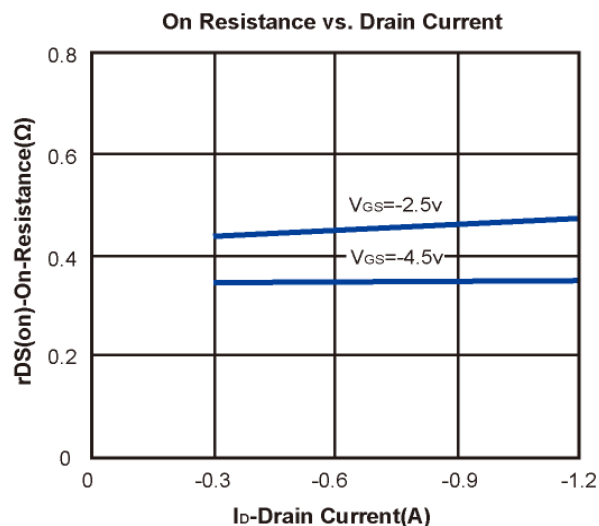
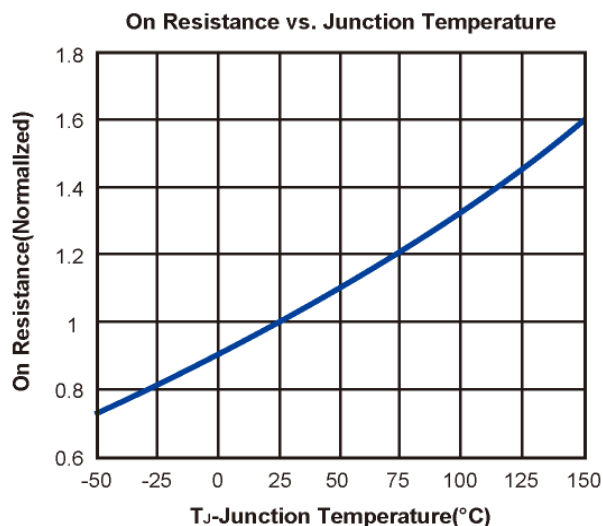
| Parameter            | Symbol   | Maximum Ratings | Unit |
|----------------------|----------|-----------------|------|
| Drain-Source Voltage | $V_{DS}$ | -30             | V    |
| Gate-Source Voltage  | $V_{GS}$ | $\pm 6$         | V    |

**Electrical Characteristics** ( $T_J = 25^{\circ}\text{C}$  Unless Otherwise Specified)

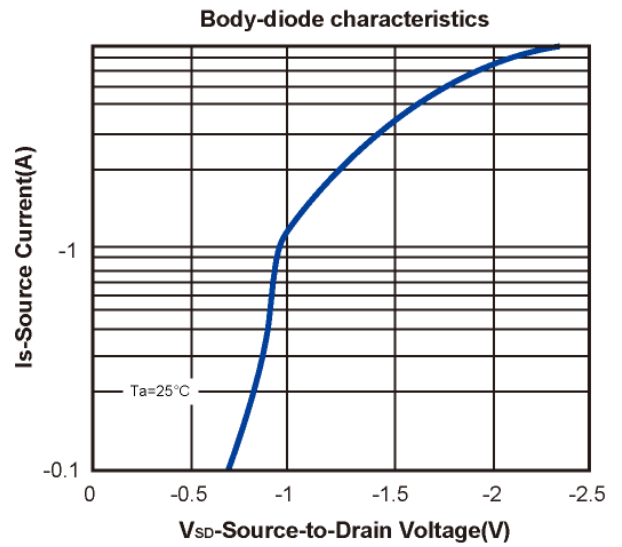
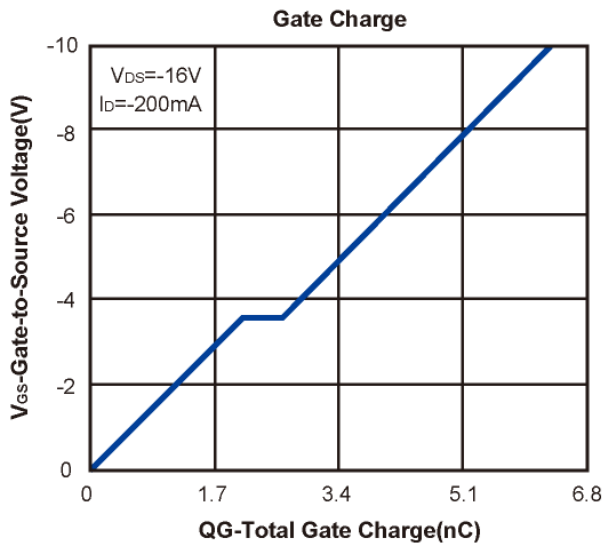
| Symbol         | Parameter                               | Limit  | Min  | Typ  | Max      | Unit     |
|----------------|---|--|------|------|----------|----------|
| <b>STATIC</b>  |   |  |      |      |          |          |
| $BV_{DSS}$     | Drain-Source Breakdown Voltage          | $V_{GS}=0V, I_D=-250\mu A$   | -30  |      |          | V        |
| $V_{GS(th)}$   | Gate Threshold Voltage                  | $V_{DS}=V_{GS}, I_D=-250\mu A$   | 0.50 | 0.85 | 1.2      | V        |
| $I_{GSS}$      | Gate Leakage Current                    | $V_{DS}=0V, V_{GS}=\pm 4.5V$   |      |      | $\pm 10$ | $\mu A$  |
| $I_{DSS}$      | Zero Gate Voltage Drain Current         | $V_{DS}=-16V, V_{GS}=0V$   |      |      | -1       | $\mu A$  |
| $R_{DS(on)}$   | Drain-Source On-Resistance <sup>a</sup> | $V_{GS}=-4.5V, I_D=-780mA$   |      | 0.30 | 0.40     | $\Omega$ |
|                |   | $V_{GS}=-2.5V, I_D=-660mA$   |      | 0.40 | 0.60     |          |
| $V_{SD}$       | Diode Forward Voltage                   | $I_S=-350mA, V_{GS}=0V$  |      | -0.8 | -1.2     | V        |
| <b>DYNAMIC</b> |   |  |      |      |          |          |
| $C_{iss}$      | Input Capacitance                       | $V_{DS}=-16V, V_{GS}=0V, f=1MHz$   |      | 152  |          | pF       |
| $C_{oss}$      | Output Capacitance                      |  |      | 18.5 |          |          |
| $C_{rss}$      | Reverse Transfer Capacitance            |  |      | 6    |          |          |
| $Q_g$          | Total Gate Charge                       | $V_{DS}=-16V, V_{GS}=-4.5V, I_D=-200mA$                                    |      | 2.8  |          | nC       |
| $Q_{gs}$       | Gate-Source Charge                      |  |      | 2.1  |          |          |
| $Q_{gd}$       | Gate-Drain Charge                       |  |      | 0.5  |          |          |
| $t_{d(on)}$    | Turn-On Delay Time                      | $V_{DD}=-10V, R_L=50\Omega$<br>$V_{GEN}=-5V, R_G=10\Omega$<br>$I_D=-200mA$ |      | 51.3 |          | ns       |
| $t_r$          | Turn-On Rise Time                       |  |      | 24.2 |          |          |
| $t_{d(off)}$   | Turn-Off Delay Time                     |  |      | 246  |          |          |
| $t_f$          | Turn-Off Fall Time                      |  |      | 81.2 |          |          |

- Notes: a. Based on Eutectic paste and bond wire Cu wire 1mil×1(S), Cu wire 1mil×1(G) on each die of SOT-523 package.  
b. Pulse test; pulse width  $\leq 300\mu s$ , duty cycle  $\leq 2\%$ .  
c. H&M SEMI reserves the right to improve product design, functions and reliability without notice.

### Typical Characteristics (T<sub>J</sub> = 25°C Noted)

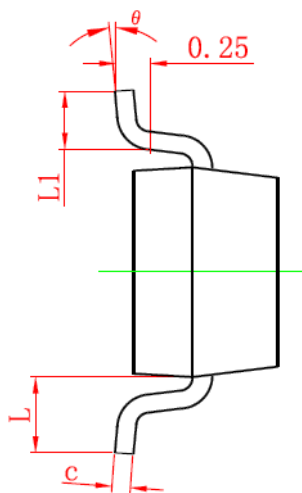
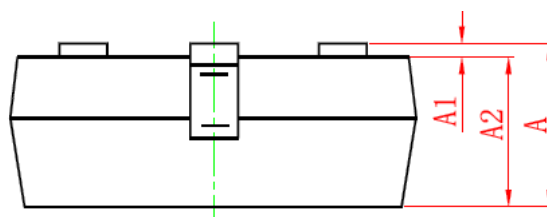
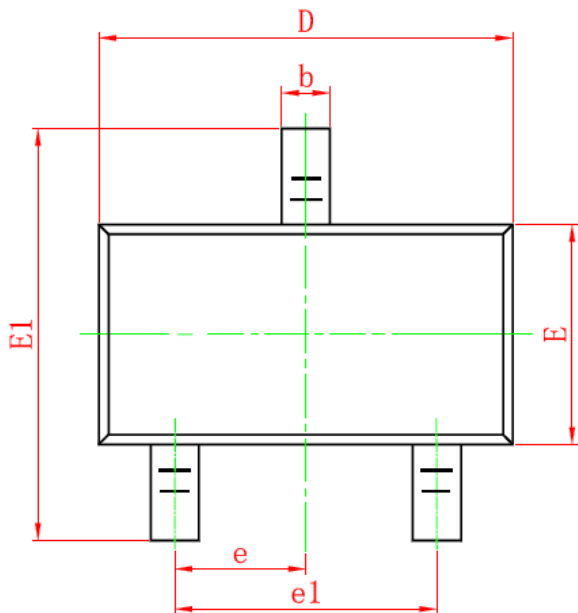


## Typical Characteristics (T<sub>J</sub> =25°C Noted)



## SOT-23 PACKAGE INFORMATION

Dimensions in Millimeters (UNIT:mm)



| Symbol | Dimensions in Millimeters |       |
|--------|---------------------------|-------|
|        | MIN.                      | MAX.  |
| A      | 0.900                     | 1.150 |
| A1     | 0.000                     | 0.100 |
| A2     | 0.900                     | 1.050 |
| b      | 0.300                     | 0.500 |
| c      | 0.080                     | 0.150 |
| D      | 2.800                     | 3.000 |
| E      | 1.200                     | 1.400 |
| E1     | 2.250                     | 2.550 |
| e      | 0.950TYP                  |       |
| e1     | 1.800                     | 2.000 |
| L      | 0.550REF                  |       |
| L1     | 0.300                     | 0.500 |
| θ      | 0°                        | 8°    |

### NOTES

1. All dimensions are in millimeters.
2. Tolerance  $\pm 0.10\text{mm}$  (4 mil) unless otherwise specified
3. Package body sizes exclude mold flash and gate burrs. Mold flash at the non-lead sides should be less than 5 mils.
4. Dimension L is measured in gauge plane.
5. Controlling dimension is millimeter, converted inch dimensions are not necessarily exact.