

## 1.Description

The SI2317A uses advanced trench technology to provide excellent  $R_{DS(ON)}$ , and low gate charge. This device is suitable for use as a load switch or in PWM applications.

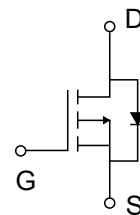
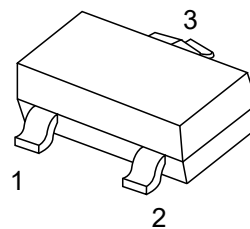
## 2.Features

- $V_{DS(V)} = -20V$
- $R_{DS(ON)} < 40m\Omega (V_{GS} = -4.5V, I_D = -4.2A)$
- $R_{DS(ON)} < 50m\Omega (V_{GS} = -2.5V, I_D = -3.4A)$

## 3.Pinning information

| Pin | Symbol | Description |
|-----|--------|-------------|
| 1   | G      | GATE        |
| 2   | S      | SOURCE      |
| 3   | D      | DRAIN       |

### SOT-23



## 4.Absolute Maximum Ratings $T_A = 25^\circ C$

| Parameter                                        |                    | Symbol          | Maximum    | Units        |
|--------------------------------------------------|--------------------|-----------------|------------|--------------|
| Drain-Source Voltage                             |                    | $V_{DS}$        | -20        | V            |
| Gate-Source Voltage                              |                    | $V_{GS}$        | $\pm 12$   | V            |
| Continuous Drain Current                         | $T_A = 25^\circ C$ | $I_D$           | -4.2       | A            |
|                                                  | $T_A = 70^\circ C$ |                 | -3.4       |              |
| Pulsed Drain Current                             |                    | $I_{DM}$        | -10        |              |
| Power Dissipation                                | $T_A = 25^\circ C$ | $P_D$           | 1.38       | W            |
|                                                  | $T_A = 70^\circ C$ |                 | 0.8        |              |
| Thermal Resistance.Junction-to-Ambient           |                    | $R_{\theta JA}$ | 90         | $^\circ C/W$ |
| Operating junction and storage temperature range |                    | $T_J, T_{STG}$  | -55 to 150 | $^\circ C$   |



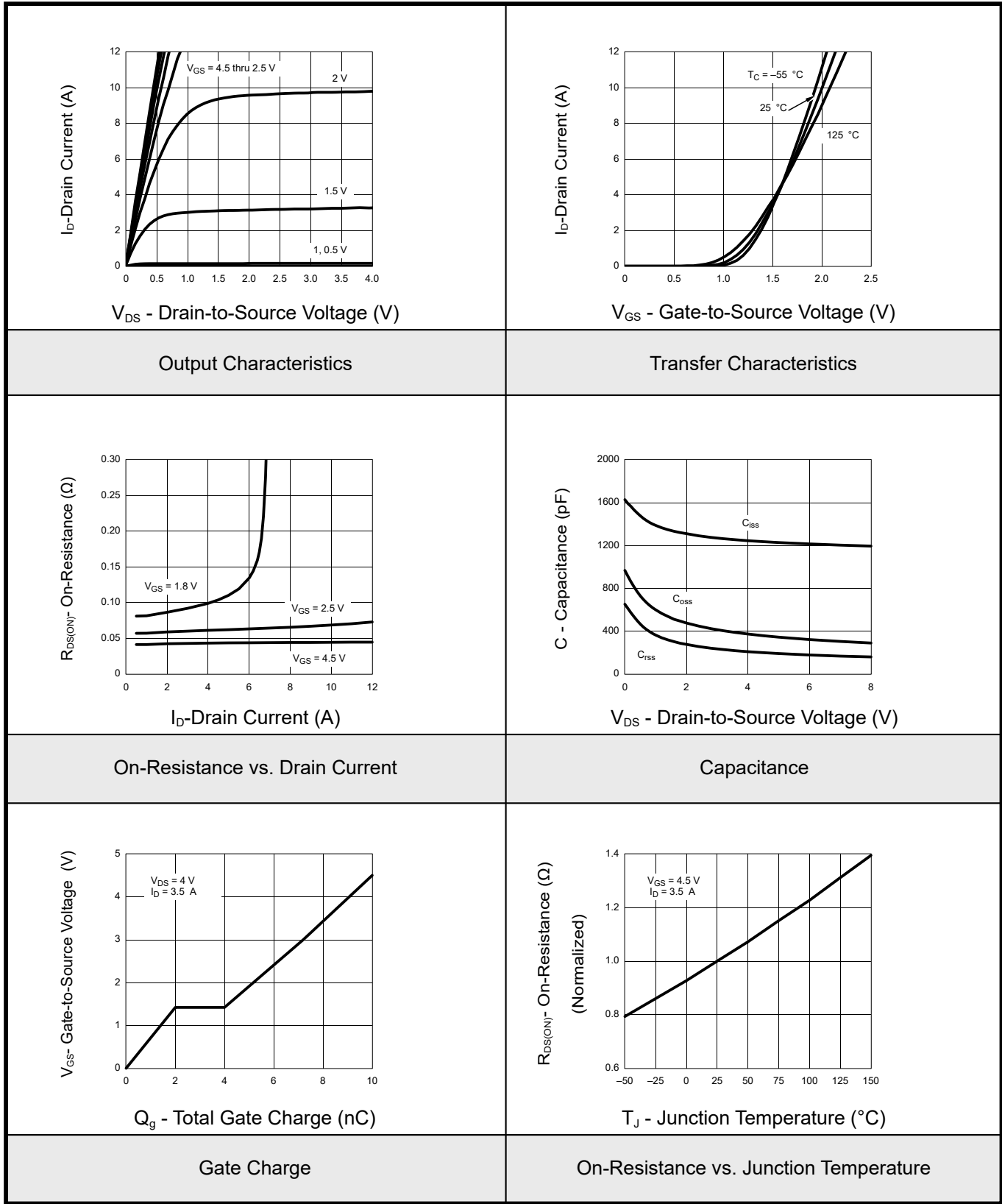
## 5. Electrical Characteristics $T_A = 25^\circ\text{C}$

| Parameter                                      | Symbol       | Conditions                                                                                                      | Min  | Typ  | Max       | Units         |
|------------------------------------------------|--------------|-----------------------------------------------------------------------------------------------------------------|------|------|-----------|---------------|
| Drain-Source Breakdown Voltage                 | $V_{DSS}$    | $I_D = -10\mu\text{A}$ , $V_{GS} = 0\text{V}$                                                                   | -20  |      |           | V             |
| Gate threshold voltage                         | $V_{GS(th)}$ | $V_{DS} = V_{GS}$ , $I_D = -250\mu\text{A}$                                                                     | -0.5 |      |           | V             |
| Zero Gate Voltage Drain Current                | $I_{DSS}$    | $V_{DS} = -20\text{V}$ , $V_{GS} = 0\text{V}$                                                                   |      |      | -1        | $\mu\text{A}$ |
|                                                |              | $V_{DS} = -16\text{V}$ , $V_{GS} = 0\text{V}$ , $T_J = 55^\circ\text{C}$                                        |      |      | -10       | $\mu\text{A}$ |
| Gate-body leakage                              | $I_{GSS}$    | $V_{DS} = 0\text{V}$ , $V_{GS} = \pm 12\text{V}$                                                                |      |      | $\pm 100$ | nA            |
| Drain-source on-state resistance               | $R_{DS(ON)}$ | $V_{GS} = -4.5\text{V}$ , $I_D = -4.2\text{A}$                                                                  |      |      | 40        | m $\Omega$    |
|                                                |              | $V_{GS} = -2.5\text{V}$ , $I_D = -3.4\text{A}$                                                                  |      |      | 50        |               |
| On-state drain current                         | $I_{D(ON)}$  | $V_{DS} \leq -5\text{V}$ , $V_{GS} = -4.5\text{V}$                                                              | -6   |      |           | A             |
|                                                |              | $V_{DS} \leq -5\text{V}$ , $V_{GS} = -2.5\text{V}$                                                              | -3   |      |           |               |
| Forward transconductance                       | $g_{FS}$     | $V_{DS} = -5\text{V}$ , $I_D = -2.8\text{A}$                                                                    |      | 9    |           | S             |
| Input capacitance *                            | $C_{iss}$    | $V_{GS} = 0\text{V}$ , $V_{DS} = -15\text{V}$ , $f = 1\text{MHz}$                                               |      | 740  |           | pF            |
| Output capacitance *                           | $C_{oss}$    |                                                                                                                 |      | 167  |           |               |
| Reverse transfer capacitance *                 | $C_{rss}$    |                                                                                                                 |      | 126  |           |               |
| Total gate charge *                            | $Q_g$        | $V_{DS} = -16\text{V}$                                                                                          |      | 10.6 |           | nC            |
| Gate-source charge *                           | $Q_{gs}$     | $V_{GS} = -4.5\text{V}$                                                                                         |      | 2.32 |           |               |
| Gate-drain charge *                            | $Q_{gd}$     | $I_D = -4.2\text{A}$                                                                                            |      | 3.68 |           |               |
| Turn - On Delay Time                           | $t_{D(on)}$  | $V_{DD} = -15\text{V}$ , $R_L = 3.6\Omega$<br>$I_D = -4.2\text{A}$<br>$V_{GEN} = -10\text{V}$ , $R_G = 6\Omega$ |      | 5.9  |           | ns            |
| Turn - On Rise Time                            | $t_r$        |                                                                                                                 |      | 3.6  |           | ns            |
| Turn - Off Delay Time                          | $t_{D(off)}$ |                                                                                                                 |      | 32.4 |           | ns            |
| Turn - Off Fall Time                           | $t_f$        |                                                                                                                 |      | 2.6  |           | ns            |
| Continuous source current (diode conduction) * | $I_S$        |                                                                                                                 |      | -1.6 |           | A             |
| Diode forward voltage                          | $V_{SD}$     | $I_S = -1.2\text{A}$ , $V_{GS} = 0\text{V}$                                                                     |      |      | -1.2      | V             |

\* Pulse test:  $PW \leq 300\mu\text{s}$  duty cycle  $\leq 2\%$ .

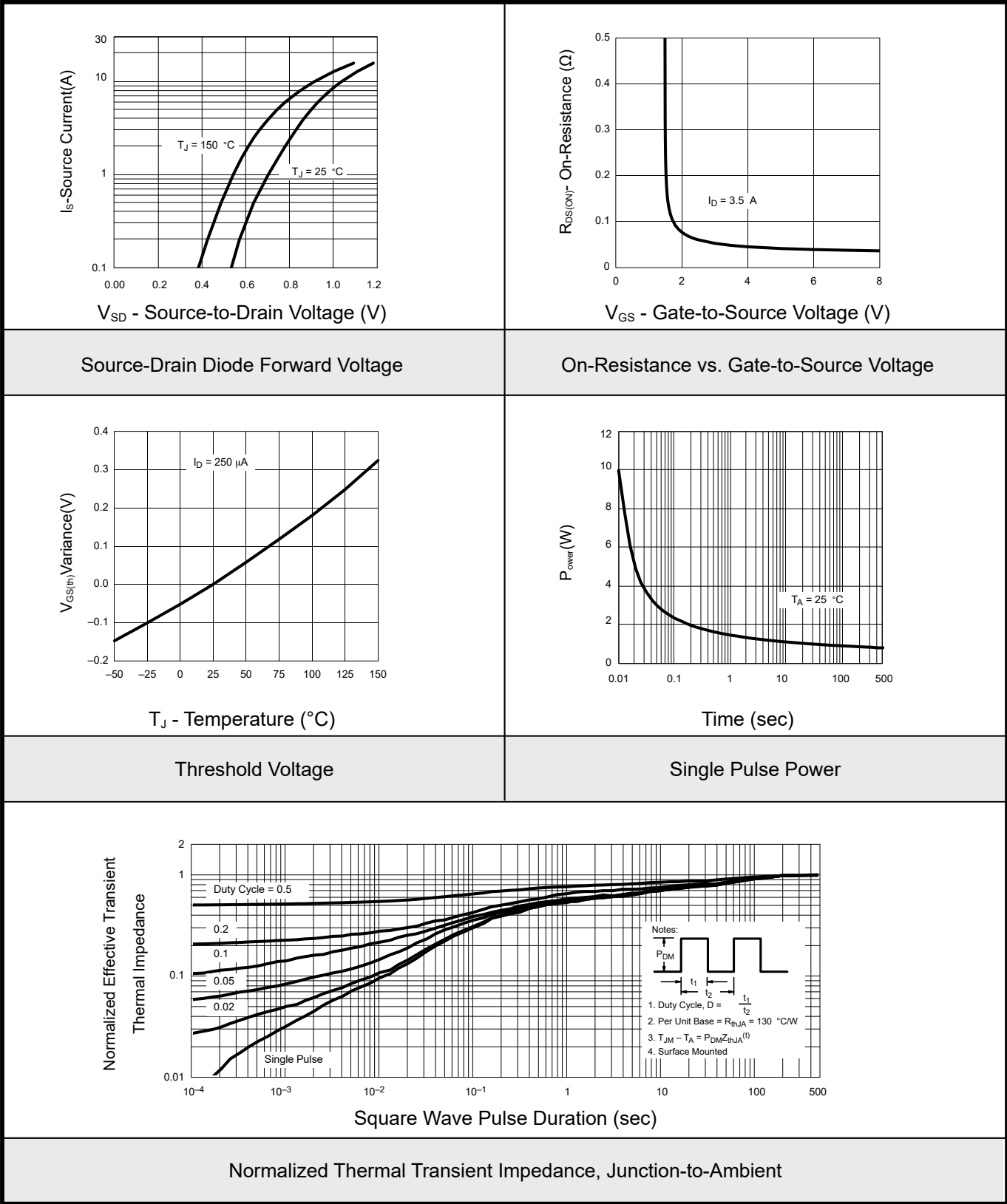


6.1Typical Characteristics



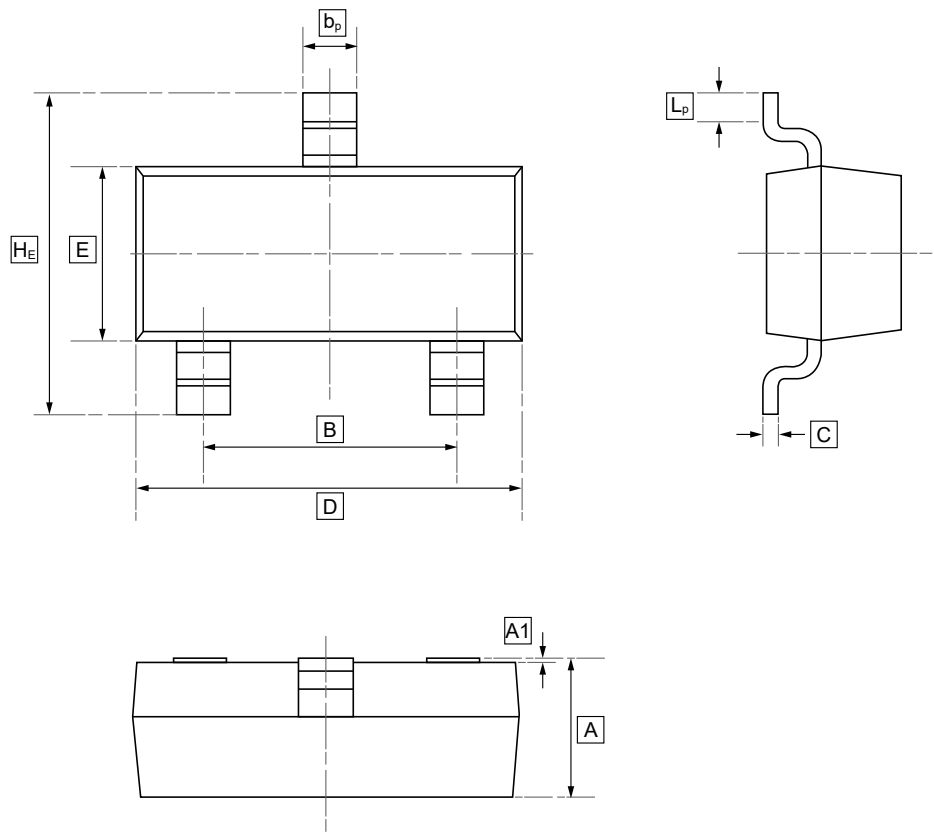


6.2Typical Characteristics





7.SOT-23 Package Outline Dimensions

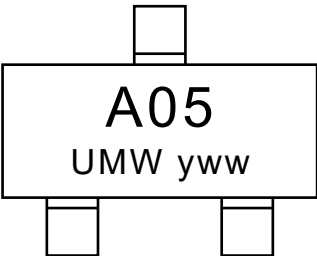


DIMENSIONS (mm are the original dimensions)

| Symbol | A    | B    | b <sub>p</sub> | C    | D    | E    | H <sub>E</sub> | A1    | L <sub>p</sub> |
|--------|------|------|----------------|------|------|------|----------------|-------|----------------|
| Min    | 0.95 | 1.78 | 0.35           | 0.08 | 2.70 | 1.20 | 2.20           | 0.013 | 0.20           |
| Max    | 1.40 | 2.04 | 0.50           | 0.19 | 3.10 | 1.65 | 3.00           | 0.100 | 0.50           |



8.Ordering information



yww: Batch Code

| Order Code  | Package | Base QTY | Delivery Mode |
|-------------|---------|----------|---------------|
| UMW SI2317A | SOT-23  | 3000     | Tape and reel |



## 9.Disclaimer

UMW reserves the right to make changes to all products, specifications. Customers should obtain the latest version of product documentation and verify the completeness and currency of the information before placing an order.

When applying our products, please do not exceed the maximum rated values, as this may affect the reliability of the entire system. Under certain conditions, any semiconductor product may experience faults or failures. Buyers are responsible for adhering to safety standards and implementing safety measures during system design, prototyping, and manufacturing when using our products to prevent potential failure risks that could lead to personal injury or property damage.

Unless explicitly stated in writing, UMW products are not intended for use in medical, life-saving, or life-sustaining applications, nor for any other applications where product failure could result in personal injury or death. If customers use or sell the product for such applications without explicit authorization, they assume all associated risks.

When reselling, applying, or exporting, please comply with export control laws and regulations of China, the United States, the United Kingdom, the European Union, and other relevant countries, regions, and international organizations.

This document and any actions by UMW do not grant any intellectual property rights, whether express or implied, by estoppel or otherwise. The product names and marks mentioned herein may be trademarks of their respective owners.