

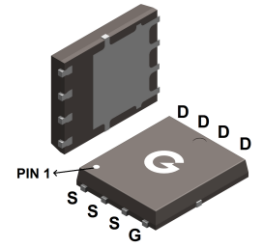
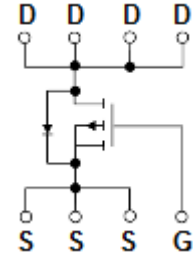
## Features

- Advanced trench technology
- Super low on-resistance
- Fast switching speed
- HBM: AEC-Q101-001: H2 (JESD22-A114-B: 2)
- Halogen free
- Qualified to AEC-Q101 standards for high reliability

**HF**

## Mechanical Data

- Case: PDFN5×6-8L
- Molding Compound: UL Flammability Classification Rating 94V-0
- Terminals: Matte tin-plated leads; solderability-per MIL-STD-202, Method 208



**PDFN5×6-8L**

## Ordering Information

| Part Number     | Package    | Shipping Quantity      | Marking Code |
|-----------------|------------|------------------------|--------------|
| TQBL065P04-5DL8 | PDFN5×6-8L | 5000 pcs / Tape & Reel | 065P04       |

## Maximum Ratings (@ T<sub>C</sub> = 25°C unless otherwise specified)

| Parameter                                                           | Symbol           | Value      | Unit |
|---------------------------------------------------------------------|------------------|------------|------|
| Drain-to-Source Voltage                                             | V <sub>DSS</sub> | -40        | V    |
| Gate-to-Source Voltage                                              | V <sub>GSS</sub> | ±20        | V    |
| Continuous Drain Current (T <sub>C</sub> = 25°C)                    | I <sub>D</sub>   | -96        | A    |
| Continuous Drain Current (T <sub>C</sub> = 100°C)                   |                  | -68        | A    |
| Continuous Drain Current (T <sub>A</sub> = 25°C) *1                 |                  | -17        | A    |
| Continuous Drain Current (T <sub>A</sub> = 100°C) *1                |                  | -12        | A    |
| Pulsed Drain Current (t <sub>p</sub> = 10μs, T <sub>C</sub> = 25°C) | I <sub>DM</sub>  | -384       | A    |
| Single Pulse Avalanche Energy *3                                    | E <sub>AS</sub>  | 230        | mJ   |
| Power Dissipation (T <sub>C</sub> = 25°C)                           | P <sub>D</sub>   | 115        | W    |
| Operating Junction Temperature Range                                | T <sub>J</sub>   | -55 ~ +175 | °C   |
| Storage Temperature Range                                           | T <sub>STG</sub> | -55 ~ +175 | °C   |

## Thermal Characteristics

| Parameter                             | Symbol           | Min. | Typ. | Max. | Unit |
|---------------------------------------|------------------|------|------|------|------|
| Thermal Resistance Junction-to-Case   | R <sub>θJC</sub> | -    | 0.8  | 1.3  | °C/W |
| Thermal Resistance Junction-to-Air *1 | R <sub>θJA</sub> | -    | 26   | 40   | °C/W |

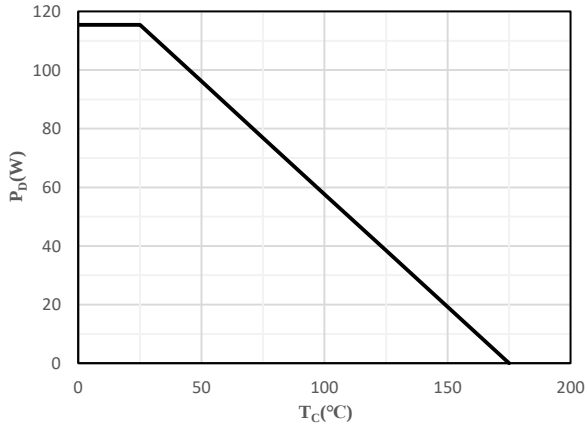
### Electrical Characteristics (@ $T_A = 25^\circ\text{C}$ unless otherwise specified)

| Symbol                             | Parameter                       | Test Condition                                              | Min. | Typ. | Max. | Unit |
|------------------------------------|---------------------------------|-------------------------------------------------------------|------|------|------|------|
| Static Characteristics             |                                 |                                                             |      |      |      |      |
| V <sub>DSS</sub>                   | Drain-Source Breakdown Voltage  | V <sub>GS</sub> = 0V, I <sub>D</sub> = -250μA               | -40  | -    | -    | V    |
| I <sub>DSS</sub>                   | Zero Gate Voltage Drain Current | V <sub>DS</sub> = -40V, V <sub>GS</sub> = 0V                | -    | -    | -1   | μA   |
| I <sub>GSS</sub>                   | Gate-Body Leakage Current       | V <sub>GS</sub> = ±20V, V <sub>DS</sub> = 0V                | -    | -    | ±100 | nA   |
| On Characteristics                 |                                 |                                                             |      |      |      |      |
| R <sub>DS(ON)</sub>                | Drain-Source On-resistance *2   | V <sub>GS</sub> = -10V, I <sub>D</sub> = -20A               | -    | 4.7  | 6.5  | mΩ   |
|                                    |                                 | V <sub>GS</sub> = -4.5V, I <sub>D</sub> = -10A              | -    | 6.3  | 9.0  | mΩ   |
| V <sub>GS(th)</sub>                | Gate Threshold Voltage          | V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = -250μA | -1   | -1.7 | -2.5 | V    |
| R <sub>G</sub>                     | Gate Resistance                 | V <sub>GS</sub> = 0V, f = 1MHz                              | -    | 2.9  | -    | Ω    |
| Dynamic Characteristics            |                                 |                                                             |      |      |      |      |
| C <sub>ISS</sub>                   | Input Capacitance               | V <sub>GS</sub> = 0V                                        | -    | 6237 | -    | pF   |
| C <sub>OSS</sub>                   | Output Capacitance              | V <sub>DS</sub> = -25V                                      | -    | 472  | -    |      |
| C <sub>RSS</sub>                   | Reverse Transfer Capacitance    | f = 100KHz                                                  | -    | 426  | -    |      |
| Switching Characteristics          |                                 |                                                             |      |      |      |      |
| t <sub>d(ON)</sub>                 | Turn-on Delay Time *4           | V <sub>DD</sub> = -20V                                      | -    | 16   | -    | ns   |
| t <sub>r</sub>                     | Turn-on Rise Time *4            | V <sub>GS</sub> = -10V                                      | -    | 17   | -    |      |
| t <sub>d(OFF)</sub>                | Turn-Off Delay Time *4          | R <sub>G</sub> = 3Ω                                         | -    | 68   | -    |      |
| t <sub>f</sub>                     | Turn-Off Fall Time *4           | I <sub>D</sub> = -20A                                       | -    | 31   | -    |      |
| Q <sub>g</sub>                     | Total Gate Charge               | V <sub>DS</sub> = -20V                                      | -    | 125  | -    | nC   |
| Q <sub>gs</sub>                    | Gate-Source Charge              | V <sub>GS</sub> = -10V                                      | -    | 15.3 | -    |      |
| Q <sub>gd</sub>                    | Gate-Drain Charge               | I <sub>D</sub> = -20A                                       | -    | 23.2 | -    |      |
| Source-Drain Diode Characteristics |                                 |                                                             |      |      |      |      |
| V <sub>SD</sub>                    | Diode Forward Voltage *2        | I <sub>S</sub> = -20A, V <sub>GS</sub> = 0V                 | -    | -0.8 | -1.2 | V    |
| t <sub>rr</sub>                    | Reverse Recovery Time           | I <sub>F</sub> = -20A, V <sub>GS</sub> = 0V                 | -    | 61   | -    | ns   |
| Q <sub>rr</sub>                    | Reverse Recovery Charge         | dI <sub>F</sub> /d <sub>t</sub> = 100A/us                   | -    | 52   | -    | nC   |

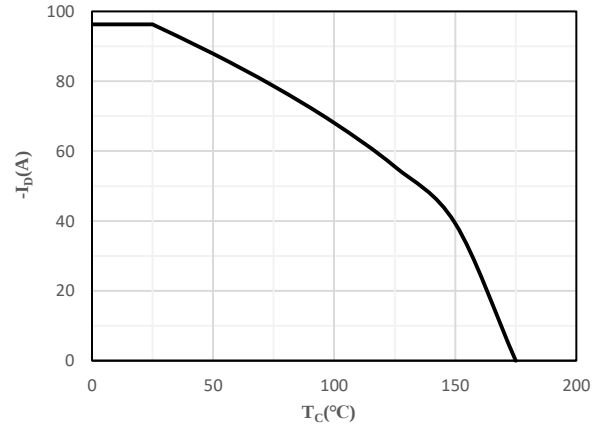
Notes:

- The data tested by surface mounted on a 1 inch<sup>2</sup> FR-4 board with 2OZ copper
- The data tested by pulsed, pulse width  $\leq 300\mu s$ , duty cycle  $\leq 2\%$
- The  $E_{AS}$  data shows Max. rating. The test condition is  $V_{DD} = -30V, V_{GS} = -10V, L = 0.5mH$
- Guaranteed by design, not subject to production

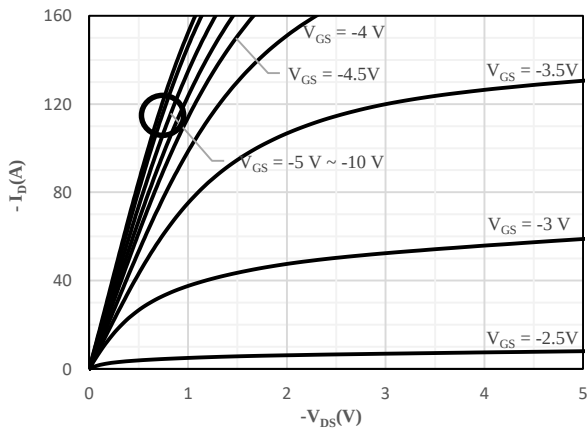
**Ratings and Characteristics Curves** (@  $T_A = 25^\circ\text{C}$  unless otherwise specified)



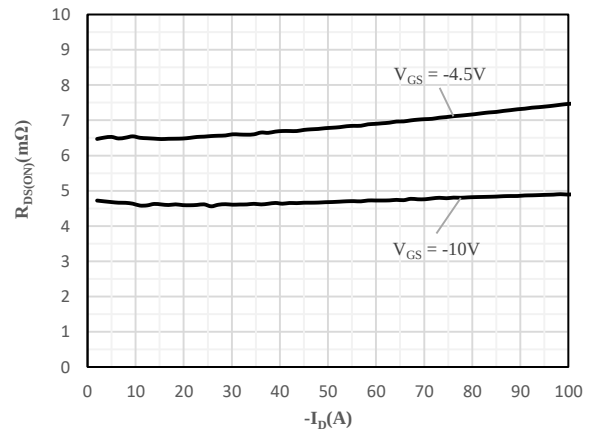
**Fig 1 Power Dissipation**



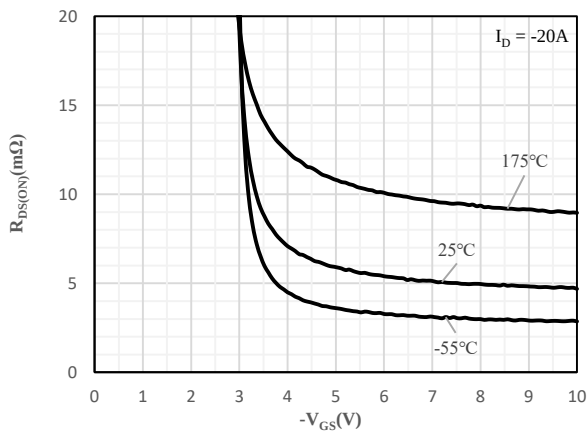
**Fig 2 Drain Current**



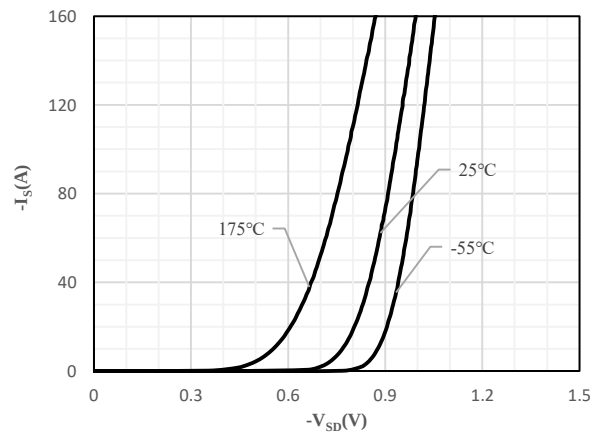
**Fig 3 Typical Output Characteristics**



**Fig 4 On-Resistance vs. Drain Current and Gate Voltage**



**Fig 5 On-Resistance vs. Gate-Source Voltage**



**Fig 6 Body-Diode Characteristics**

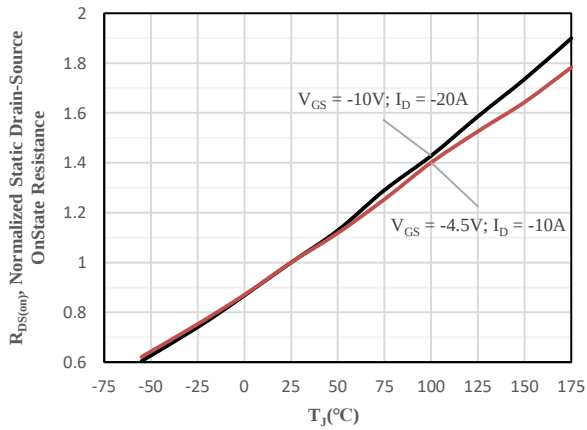


Fig 7 Normalized On-Resistance vs. Junction Temperature

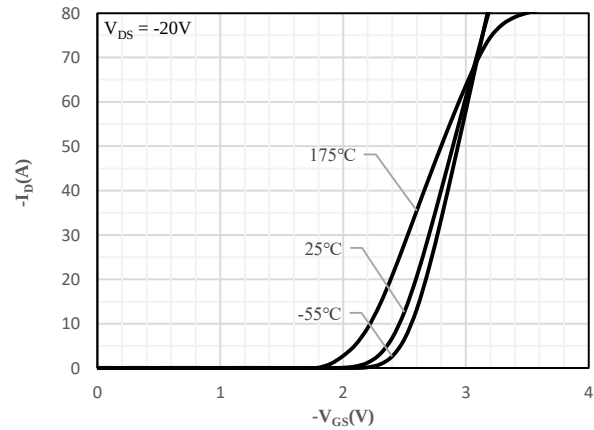


Fig 8 Transfer Characteristics

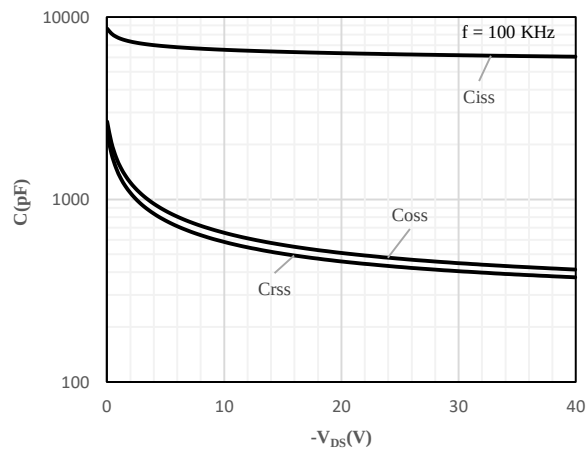


Fig 9 Capacitance Characteristics

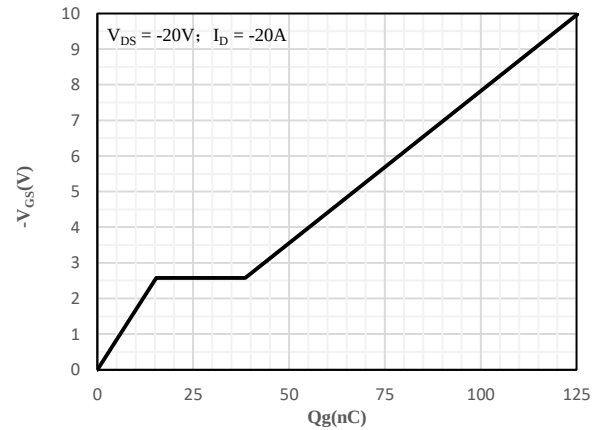


Fig 10 Gate-Charge Characteristics

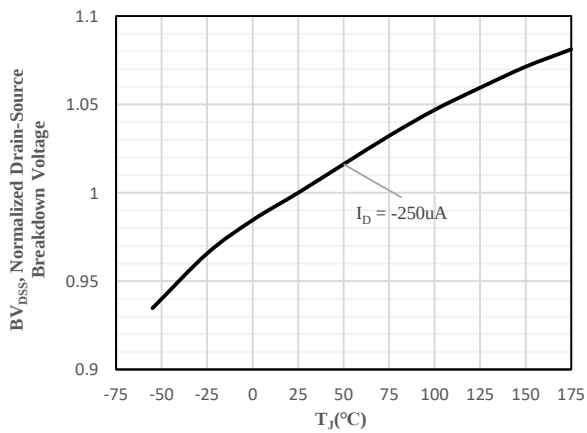


Fig 11 Normalized Breakdown Voltage vs. Junction Temperature

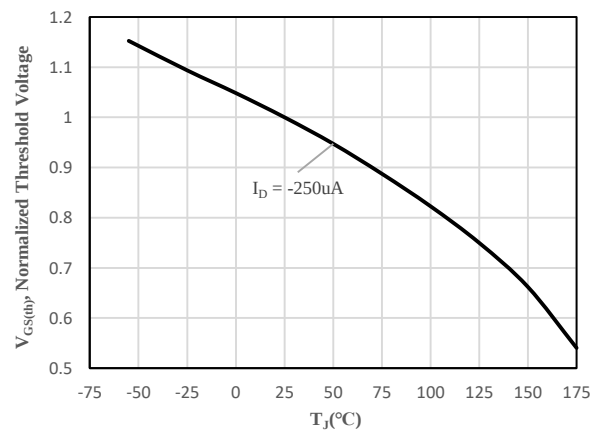
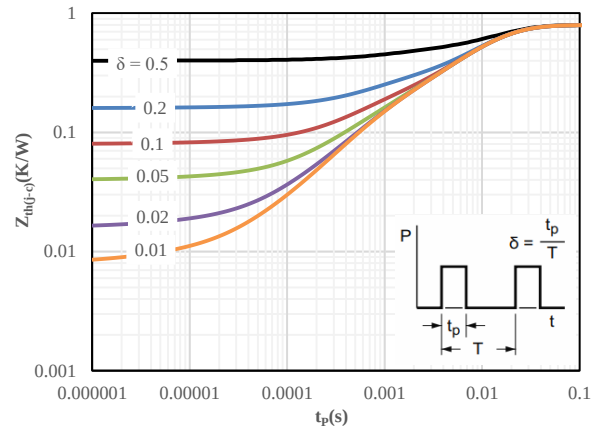
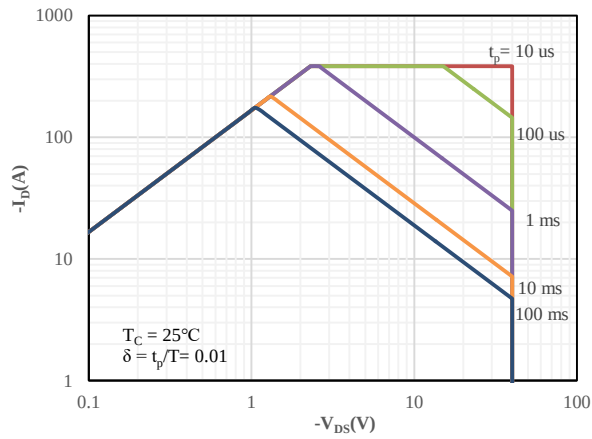
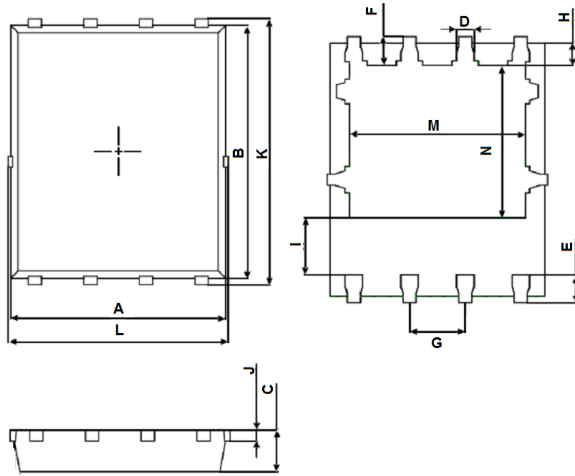


Fig 12 Normalized  $V_{GS(th)}$  vs. Junction Temperature



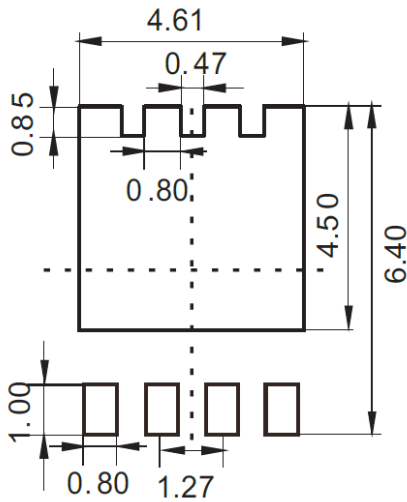
## Package Outline Dimensions (Unit: mm)



| PDFN5x6-8L |       |       |
|------------|-------|-------|
| Dimension  | Min.  | Max.  |
| A          | 4.824 | 4.976 |
| B          | 5.674 | 5.826 |
| C          | 0.900 | 1.000 |
| D          | 0.350 | 0.450 |
| E          | 0.559 | 0.711 |
| F          | 0.574 | 0.726 |
| G          | 1.250 | 1.290 |
| H          | 0.424 | 0.576 |
| I          | 1.190 | 1.390 |
| J          | 0.154 | 0.354 |
| K          | 5.974 | 6.126 |
| L          | 4.944 | 5.096 |
| M          | 3.910 | 4.110 |
| N          | 3.375 | 3.575 |

## Mounting Pad Layout (Unit: mm)

### PDFN5x6-8L



## IMPORTANT NOTICE

Changzhou Galaxy Century Microelectronics (GME) reserves the right to make changes without further notice to any product information (copyrighted) herein to make corrections, modifications, improvements, or other changes. GME does not assume any liability arising out of the application or use of any product described herein; neither does it convey any license under its patent rights, nor the rights of others.