

# KY5853DC

P-channel MOSFET and Schottky Barrier Diode

## FEATURES

- Featuring a MOSFET and Schottky Diode
- Independent Pinout to each Device to Ease Circuit Design

## Design

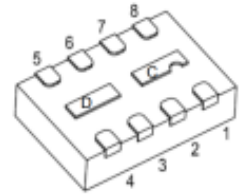
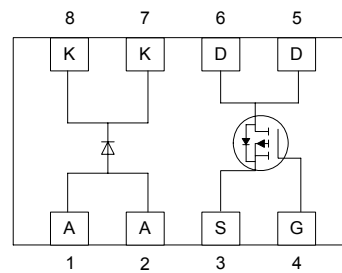
- Ultra Low VF Schottky

## Applications

- Li-Ion Battery Charging
- High Side DC-DC Conversion Circuits
- High Side Drive for Small Brushless DC Motors
- Power Management in Portable, Battery Powered Products

## Pin configuration

DFNWB3x2-08L-B(Top View)



Marking : .JA

## MOSFET MAXIMUM RATINGS (Ta = 25°C unless otherwise noted)

| Symbol                 | Parameter                               | VUi Y   | Unit  |
|------------------------|-----------------------------------------|---------|-------|
| <b>V<sub>DSS</sub></b> | Drain-Source voltage                    | -20     | V     |
| <b>V<sub>GS</sub></b>  | Gate-Source Voltage                     | ±8      | V     |
| <b>I<sub>D</sub></b>   | Continuous Drain Current                | -2.7    | A     |
| <b>I<sub>DM</sub></b>  | Drain Current-Pulsed                    | -10     | A     |
| <b>P<sub>D</sub></b>   | Power Dissipation                       | 1.1     | W     |
| <b>T<sub>J</sub></b>   | Junction Temperature                    | 150     | °C    |
| <b>T<sub>stg</sub></b> | Storage Temperature                     | -55-150 | °C    |
| <b>R<sub>θJA</sub></b> | Thermal Resistance, Junction-to-Ambient | 110     | °C /W |

## SCHOTTKY DIODE MAXIMUM RATINGS(TJ = 25° C unless otherwise noted)

| Symbol                 | Parameter                         | Limits | Unit |
|------------------------|-----------------------------------|--------|------|
| <b>V<sub>RRM</sub></b> | Peak repetitive reverse voltage   | 20     | V    |
| <b>V<sub>R</sub></b>   | DC Blocking voltage               | 20     | V    |
| <b>I<sub>F</sub></b>   | Average rectified forward current | 1      | A    |

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MOSFET ELECTRICAL CHARACTERISTICS (T<sub>amb</sub>=25°C unless otherwise specified)

| Parameter                                                     | Symbol              | Test Condition                                                                                                      | Min   | Typ  | Max  | Units |
|---------------------------------------------------------------|---------------------|---------------------------------------------------------------------------------------------------------------------|-------|------|------|-------|
| <b>Off Characteristics</b>                                    |                     |                                                                                                                     |       |      |      |       |
| Drain-Source Breakdown Voltage                                | V <sub>DSS</sub>    | V <sub>GS</sub> = 0V, I <sub>D</sub> = -250μA                                                                       | -20   |      |      | V     |
| Zero Gate Voltage Drain Current                               | I <sub>DSS</sub>    | V <sub>DS</sub> = -16V, V <sub>GS</sub> = 0V                                                                        |       |      | -1   | μA    |
| Gate -Source leakage current                                  | I <sub>GSS</sub>    | V <sub>GS</sub> = ±8V, V <sub>DS</sub> = 0V                                                                         |       |      | ±100 | nA    |
| <b>On Characteristics</b>                                     |                     |                                                                                                                     |       |      |      |       |
| Gate Threshold Voltage                                        | V <sub>GS(th)</sub> | V <sub>GS</sub> = V <sub>DS</sub> , I <sub>D</sub> = -250μA                                                         | -0.45 |      |      | V     |
| Static Drain-Source On-Resistance                             | R <sub>DS(on)</sub> | V <sub>GS</sub> = -4.5V, I <sub>D</sub> = -2.7A                                                                     |       |      | 110  | mΩ    |
|                                                               |                     | V <sub>GS</sub> = -2.5V, I <sub>D</sub> = -2.2A                                                                     |       |      | 160  | mΩ    |
|                                                               |                     | V <sub>GS</sub> = -1.8V, I <sub>D</sub> = -1A                                                                       |       |      | 240  | mΩ    |
| Forward Transconductance                                      | g <sub>FS</sub>     | V <sub>DS</sub> = -10V, I <sub>D</sub> = -2.7A                                                                      |       | 7    |      | S     |
| <b>Dynamic Characteristics</b>                                |                     |                                                                                                                     |       |      |      |       |
| Input Capacitance                                             | C <sub>iss</sub>    | V <sub>DS</sub> = -10V, V <sub>GS</sub> = 0V,<br>f = 1.0 MHz                                                        |       |      | 300  | pF    |
| Output Capacitance                                            | C <sub>oss</sub>    |                                                                                                                     |       |      | 150  | pF    |
| Reverse Transfer Capacitance                                  | C <sub>rss</sub>    |                                                                                                                     |       |      | 50   | pF    |
| <b>Switching Characteristics</b>                              |                     |                                                                                                                     |       |      |      |       |
| Turn-On Delay Time                                            | t <sub>d(on)</sub>  | V <sub>DD</sub> = -10V, R <sub>L</sub> = 10Ω<br>I <sub>D</sub> = -1A, R <sub>G</sub> = 6Ω, V <sub>GEN</sub> = -4.5V |       |      | 25   | ns    |
| Turn-On Rise Time                                             | t <sub>r</sub>      |                                                                                                                     |       |      | 45   | ns    |
| Turn-Off Delay Time                                           | t <sub>d(off)</sub> |                                                                                                                     |       |      | 45   | ns    |
| Turn-Off Fall Time                                            | t <sub>f</sub>      |                                                                                                                     |       |      | 40   | ns    |
| Total Gate Charge                                             | Q <sub>g</sub>      | V <sub>DS</sub> = -10V, I <sub>D</sub> = -2.7A,<br>V <sub>GS</sub> = -4.5V                                          |       |      | 6.5  | nC    |
| Gate-Source Charge                                            | Q <sub>gs</sub>     |                                                                                                                     |       | 1.4  |      | nC    |
| Gate-Drain Charge                                             | Q <sub>gd</sub>     |                                                                                                                     |       | 0.65 |      | nC    |
| <b>Drain-Source Diode Characteristics and Maximun Ratings</b> |                     |                                                                                                                     |       |      |      |       |
| Forward Diode Voltage                                         | V <sub>SD</sub>     | V <sub>GS</sub> = 0V, I <sub>S</sub> = -0.9A                                                                        |       |      | -1.2 | V     |

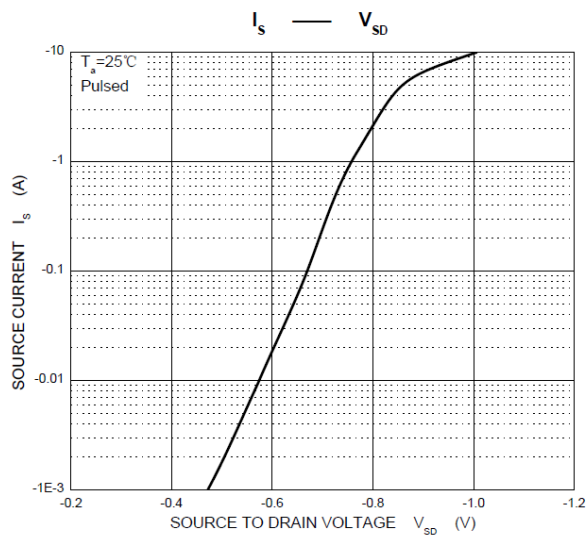
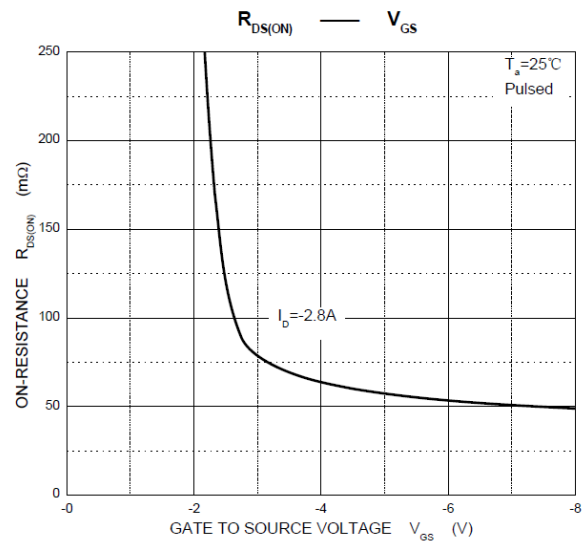
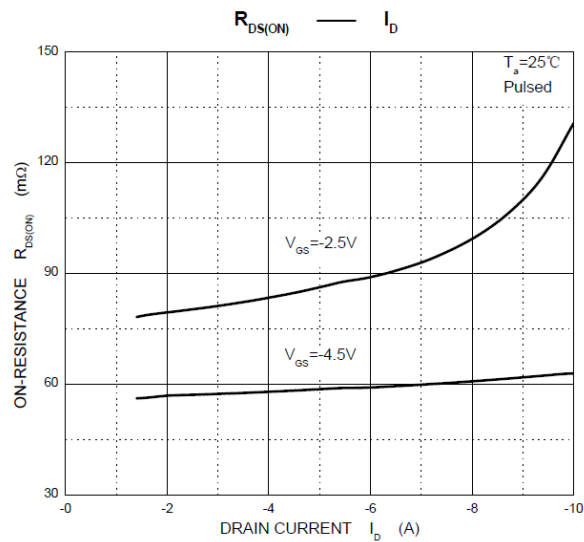
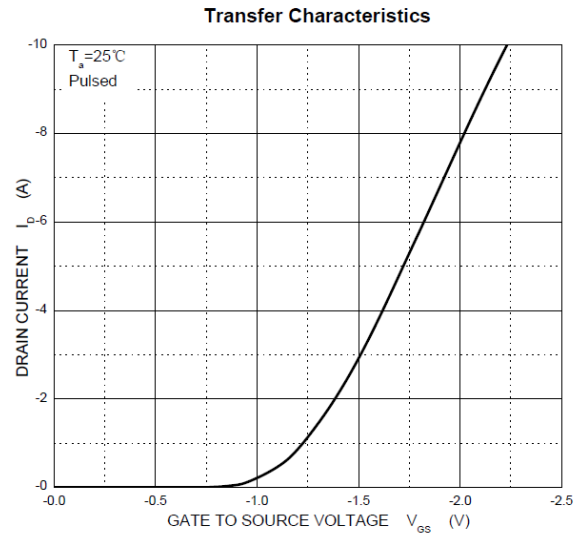
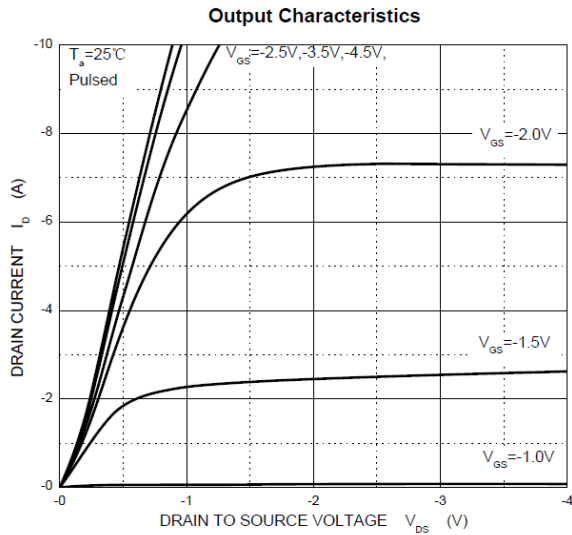
SCHOTTKY DIODE ELECTRICAL CHARACTERISTICS (T<sub>J</sub> = 25°C unless otherwise noted)

| Parameter                   | Symbol         | Min | Typ | Max  | Unit | Conditions                  |
|-----------------------------|----------------|-----|-----|------|------|-----------------------------|
| <b>Forward voltage</b>      | V <sub>F</sub> |     |     | 0.48 | V    | I <sub>F</sub> = 0.5A       |
| <b>Reverse current</b>      | I <sub>R</sub> |     |     | 100  | μA   | V <sub>R</sub> = 20V        |
| <b>Junction capacitance</b> | C <sub>T</sub> |     | 31  |      | pF   | V <sub>R</sub> = 10V, f = 0 |

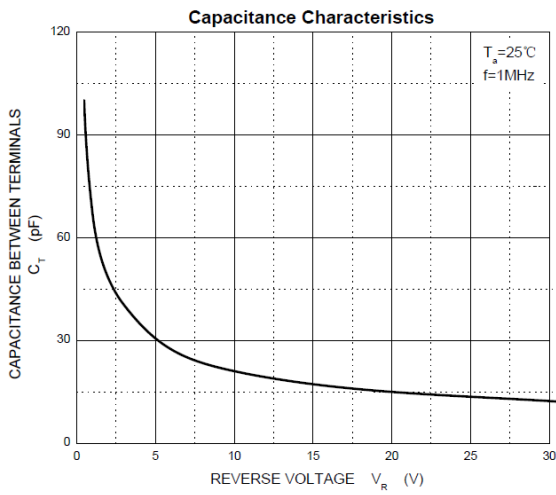
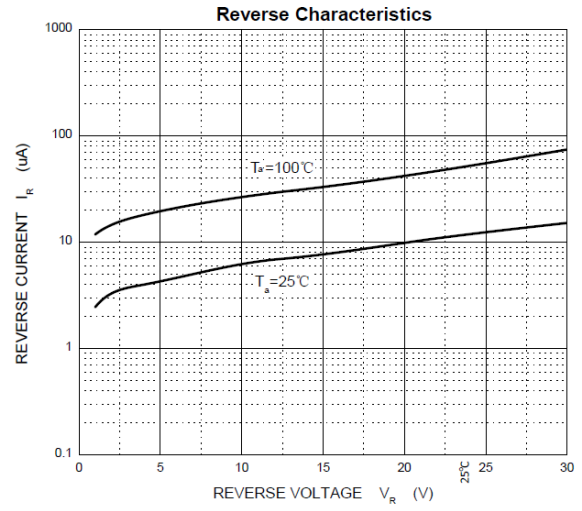
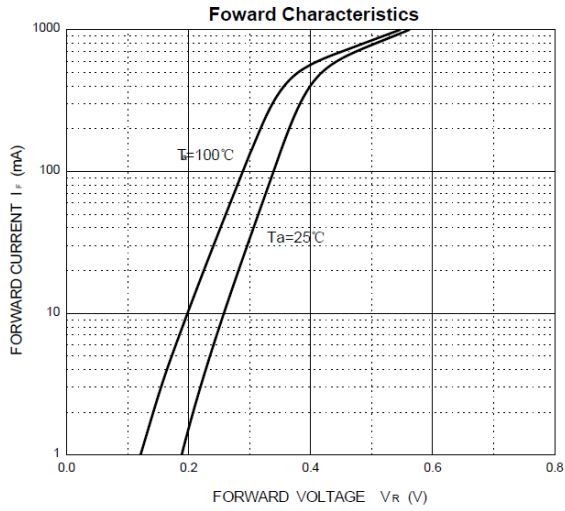
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## Typical Characteristics

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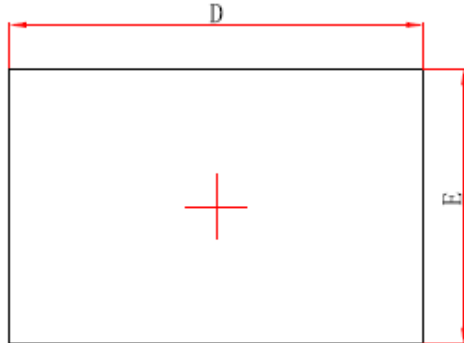
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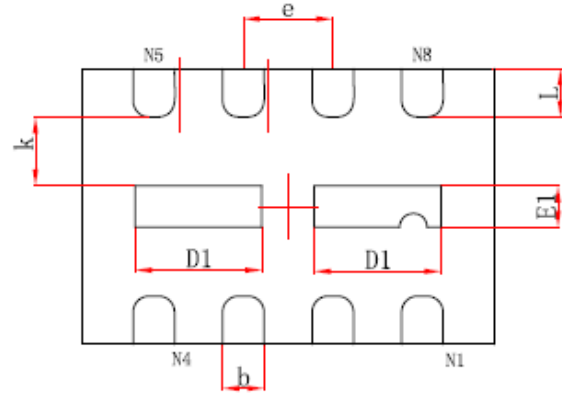
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## PACKAGE OUTLINE

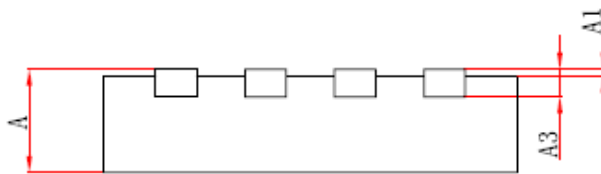
DFNWB3X2-8L-B(P0.65T0.75/0.85)



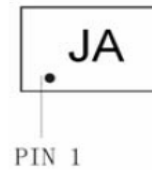
**Top View**



**Bottom View**



**Side View**



**Marking**

| Symbol | Dimensions In Millimeters |       | Dimensions In Inches |       |
|--------|---------------------------|-------|----------------------|-------|
|        | Min.                      | Max.  | Min.                 | Max.  |
| A      | 0.600                     | 0.800 | 0.023                | 0.031 |
| A1     | 0.000                     | 0.050 | 0.000                | 0.002 |
| A3     | 0.203REF.                 |       | 0.008REF.            |       |
| D      | 2.900                     | 3.100 | 0.114                | 0.122 |
| E      | 1.900                     | 2.100 | 0.075                | 0.083 |
| D1     | 0.820                     | 1.020 | 0.032                | 0.040 |
| E1     | 0.200                     | 0.400 | 0.008                | 0.016 |
| k      | 0.200MIN.                 |       | 0.008MIN.            |       |
| b      | 0.250                     | 0.350 | 0.010                | 0.014 |
| e      | 0.650TYP.                 |       | 0.026TYP.            |       |
| L      | 0.250                     | 0.450 | 0.010                | 0.018 |

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