

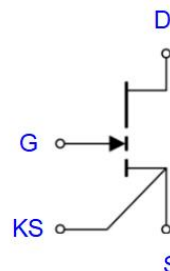
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## DX65F080 E-mode 650V,30A,80mΩ GaN HEMT

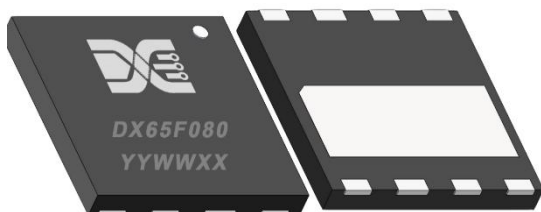
### 1. Features

- 650 V enhancement mode power switch
- $R_{DS(on)} = 80m\Omega$
- $I_{DS(max)} = 30A$
- Easy gate drive requirements (0 V to 6 V)
- Very high switching frequency (> 10 MHz)
- Fast and controllable fall and rise times
- Zero reverse recovery loss

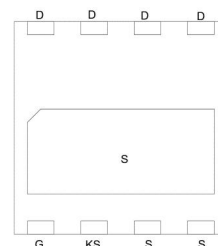


### 2. Device Information

| Part Number | Marking Code | Package | Packing     |
|-------------|--------------|---------|-------------|
| DX65F080    | DX65F080     | DFN8x8  | 260pcs/tray |



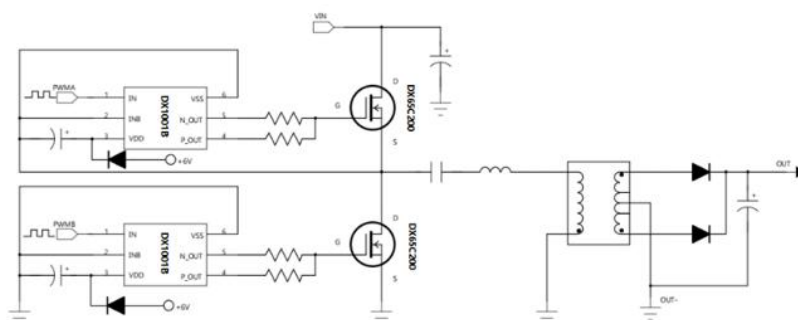
DX65F080 DFN8x8



DX65F080 Bottom View

### 3. Applications

- Fast Battery Charging
- LED lighting drivers
- Power Factor Correction
- LLC Converters
- Wireless Power Transfer



Typical application circuit for LLC

## 4. Description

DX65F080 is an enhancement mode GaN-on-silicon transistor. GaN is a wide band gap semiconductor with high power density. The gallium nitride transistor is characterized by no body diode, so the reverse recovery charge is zero.

## 5. Absolute Maximum Ratings (Tc=25°C unless otherwise specified)

| Parameter                         | Symbol   | Value      | Unit | Condition |
|-----------------------------------|----------|------------|------|-----------|
| Drain-Source voltage              | $V_{DS}$ | 650        | V    |           |
| Gate-source voltage               | $V_{GS}$ | -7 to 6    | V    |           |
| Continuous drain current*         | $I_D$    | 30         | A    | Tc=25°C   |
|                                   |          | 29         | A    | Tc=125°C  |
| Operation and storage temperature | Tj       | -55 to 150 | °C   |           |
|                                   | Tstg     | -55 to 150 | °C   |           |

\* An Estimated Value

## 6. Electrical Characteristics (Tc=25°C unless otherwise specified)

### 6.1 Typical Performance – Static

| Parameter                         | Symbol       | Values |       |      | Unit    | Test condition                            |
|-----------------------------------|--------------|--------|-------|------|---------|-------------------------------------------|
|                                   |              | Min.   | Type. | Max. |         |                                           |
| Drain source breakdown voltage    | $BV_{DS}$    | 650    | /     | /    | V       | $V_{GS}=0V$ , $I_D=20\mu A$               |
| Total drain leakage current       | $I_{DSS}$    | /      | /     | 65   | $\mu A$ | $V_{DS}=650V$ , $V_{GS}=0V$ ,<br>Tj=25°C  |
|                                   |              | /      | /     | 390  | $\mu A$ | $V_{DS}=650V$ , $V_{GS}=0V$ ,<br>Tj=150°C |
| Gate-to-source current            | $I_{GS}$     | /      | 163   | /    | $\mu A$ | $V_{DS}=0V$ , $V_{GS}=6V$ ,<br>Tj=25°C    |
| Static drain-source on-resistance | $R_{DS(ON)}$ | /      | 60    | 80   | mΩ      | $V_{GS}=6V$ , $I_D=8A$ ,<br>Tj=25°C       |
|                                   |              | /      | 120   | /    | mΩ      | $V_{GS}=6V$ , $I_D=8A$ ,<br>Tj=150°C      |
| Gate threshold voltage            | $V_{GS(th)}$ | 1.2    | 1.7   | 2.5  | V       | $V_{DS}=V_{GS}$ , $I_D=30.7mA$ ,          |

## 6.2 Typical Performance – Dynamic

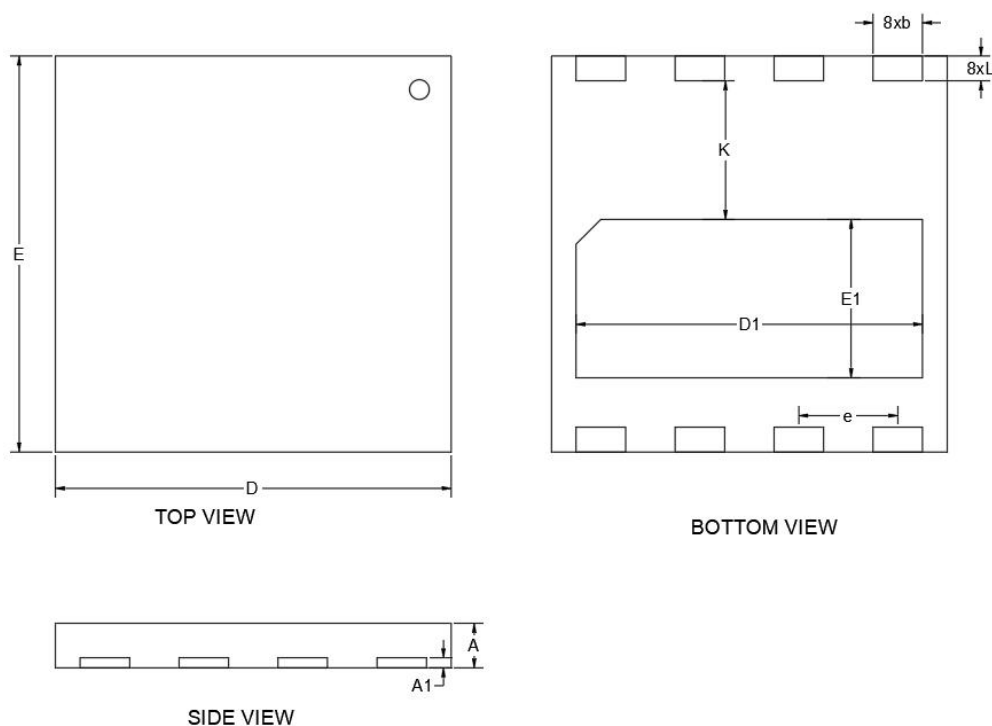
| Parameter                          | Symbol        | Values |      |     | Unit     | Test condition                                 |
|------------------------------------|---------------|--------|------|-----|----------|------------------------------------------------|
|                                    |               | Min    | Type | Max |          |                                                |
| Input capacitance                  | $C_{ISS}$     | /      | 240  | /   | pF       | $V_{DS}=400V$ ,<br>$V_{GS}=0V$ ,<br>$f=100kHz$ |
| Output capacitance                 | $C_{OSS}$     | /      | 103  | /   | pF       |                                                |
| Reverse transfer capacitance       | $C_{RSS}$     | /      | 1    | /   | pF       |                                                |
| Output capacitance, energy related | $C_{OSS(er)}$ | /      | 129  | /   | pF       | $V_{DS}=0V$ to<br>$400V, V_{GS}=0V$            |
| Output capacitance time related    | $C_{OSS(tr)}$ | /      | 179  | /   | pF       |                                                |
| Total gate charge                  | $Q_G$         | /      | 6    | /   | nC       | $V_{DS}=400V$ ,<br>$V_{GS}=0V$ to $6V$         |
| Gate-drain charge                  | $Q_{GD}$      | /      | 2.7  | /   | nC       |                                                |
| Gate-source charge                 | $Q_{GS}$      | /      | 1.2  | /   | nC       |                                                |
| Gate Resistance                    | $R_G$         | /      | 3.5  | /   | $\Omega$ | $f=5MHz$ , Open drain                          |

### Thermal characteristics

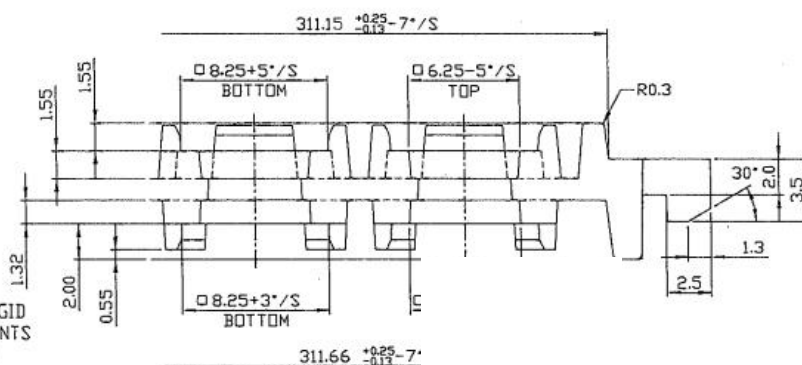
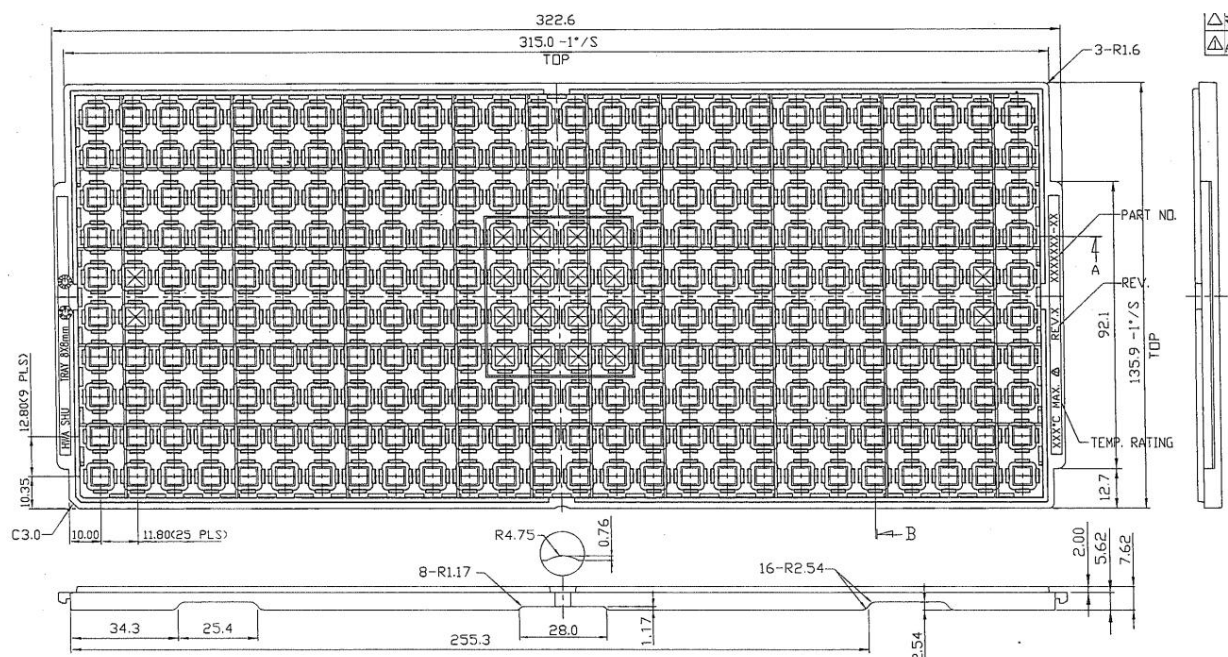
| Parameter                            | Symbol     | Values | Unit          | Note/Test Condition |
|--------------------------------------|------------|--------|---------------|---------------------|
| Thermal resistance, junction-ambient | $R_{thJA}$ | 57.6   | $^{\circ}C/W$ |                     |
| Thermal resistance, junction-case    | $R_{thJC}$ | 1.1    | $^{\circ}C/W$ |                     |
| Maximum reflow soldering temperature | $T_{sold}$ | 260    | $^{\circ}C$   | MSL3                |

## 7. Package

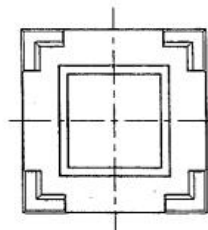
| Dimensions(mm) |           |      |      |
|----------------|-----------|------|------|
| Symbol         | Min.      | Nom. | Max. |
| A              | 0.80      | 0.90 | 1.00 |
| A1             | REF 0.203 |      |      |
| b              | 0.95      | 1.00 | 1.05 |
| D              | 7.90      | 8.00 | 8.10 |
| D1             | 6.90      | 7.00 | 7.10 |
| E              | 7.90      | 8.00 | 8.10 |
| E1             | 3.10      | 3.20 | 3.30 |
| e              | REF 2.00  |      |      |
| k              | REF 2.80  |      |      |
| L              | 0.45      | 0.50 | 0.55 |



## 8. Product packaging



SECTION A (4/1)



NOTES :

1. (S.R. OHM/SQ.) MEANS SURFACE ELECTRIC RESISTIVITY OF THE TRAY.
2. THE MOLDED TRAY'S MATERIAL SHALL BE RIGID ENOUGH TO AVOID DAMAGE TO THE COMPONENTS DURING HANDLING, LOADING, BACKING, TESTING, SHIPPING AND PLACING.
3. TRAYS ARE STACKABLE WITHOUT INTERFERENCE AND WILL NOT STICK TOGETHER DURING UNSTACKING OPERATION.
4. WARPAGE IS WITHIN 0.76 mm.
5. THE CELLS MARKED WITH CROSS SYMBOL ARE FOR VACUUM PICKUP AREA AND WITHOUT THRU HOLES.
6. TOTAL USABLE CELLS 10X26=260.
7. ALL DIMENSIONS ARE IN MILLIMETERS.

