

Rev.B Jun.-2022

DFN8 8-3L 650V GaN  
650V GaN Enhancement-mode Power Transistor in a DFN8 ×

| Parameter                                               | Symbol          | Rating     | Unit |
|---------------------------------------------------------|-----------------|------------|------|
| Drain-Source Voltage                                    | $V_{DS}$        | 650        | V    |
| Transient Drain to Source Voltage <sup>1</sup>          | $V_{TR\_DSS}$   | 725        | V    |
| Drain Current – Pulsed                                  | $I_{DM}$        | 30         | A    |
| Gate-Source Voltage                                     | $V_{GS}$        | $\pm 18$   | V    |
| Continuous current, Drain Source $T_C=25$ <sup>2</sup>  | $I_D$           | 6.5        | A    |
| Continuous current, Drain Source $T_C=100$ <sup>2</sup> |                 | 4.0        | A    |
| Power Dissipation                                       | $P_D(T_C=25)$   | 21         | W    |
| Junction and Storage Temperature Range                  | $T_J, T_{stg}$  | -55 to 150 |      |
| Thermal Resistance, Junction - Case                     | $R_{\theta JC}$ | 5.9        | / W  |
| Thermal Resistance, Junction - Ambient                  | $R_{\theta JA}$ | 50         | / W  |

## Notes

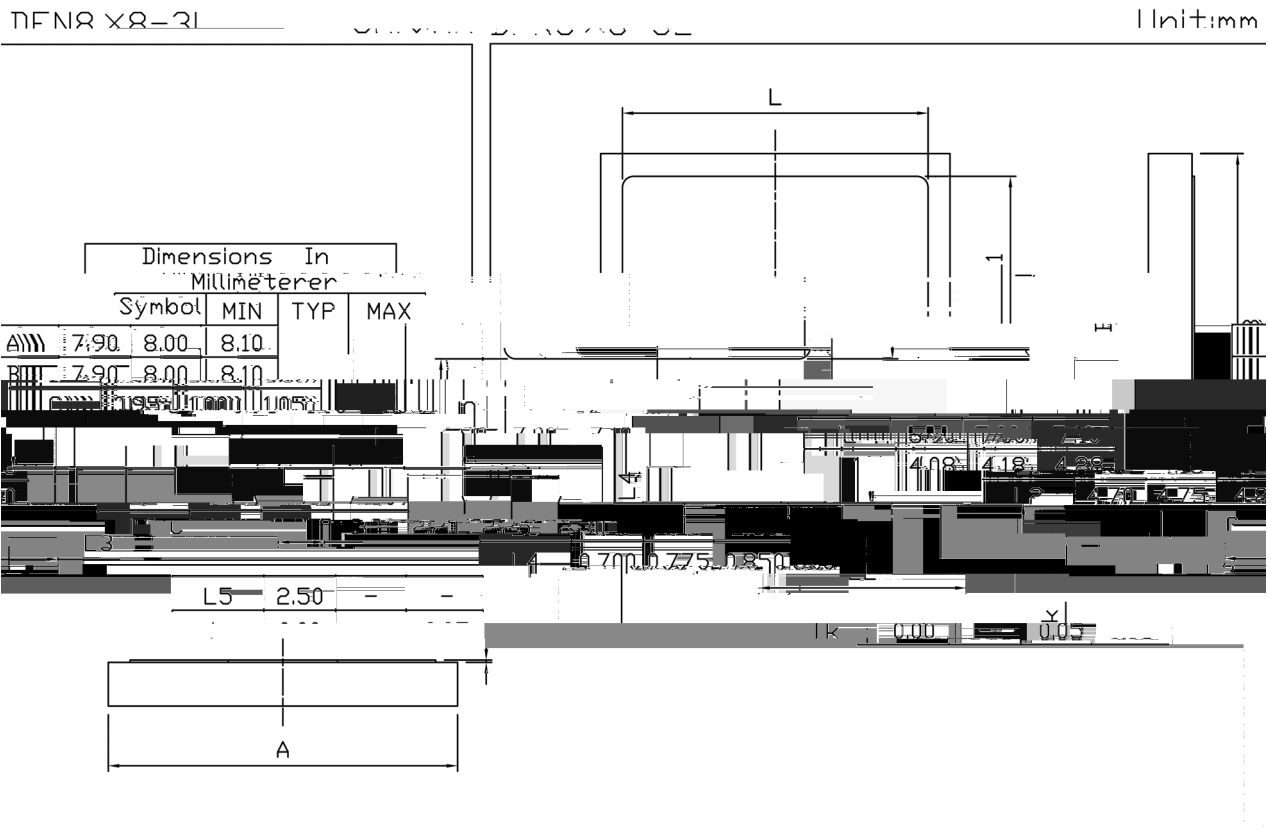
1. In off-state, spike duty cycle  $D \leq 0.01$ , spike duration  $\leq 1\mu s$
2. For increased stability at high current operation

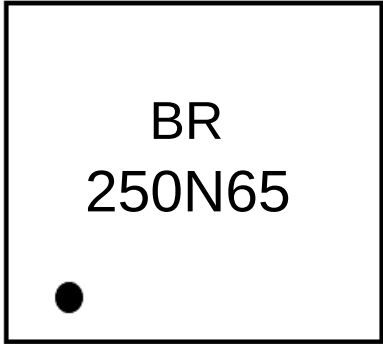
| Parameter                         | Symbol       | Test Conditions               | Min | Typ | Max       | Unit    |
|-----------------------------------|--------------|-------------------------------|-----|-----|-----------|---------|
| Reverse Breakdown Voltage         | $V_{BLDSS}$  | $V_{GS}=0V$                   | 650 |     |           | V       |
| Drain-Source Leakage Current      | $I_{DSS}$    | $V_{DS}=650V, V_{GS}=0V$      |     |     | 15        | $\mu A$ |
| Gate-Source Leakage Current       | $I_{GSS}$    | $V_{DS}=0V, V_{GS}=\pm 18V$   |     |     | $\pm 100$ | nA      |
| Gate Threshold Voltage            | $V_{GS(th)}$ | $V_{DS}=V_{GS}, I_D=500\mu A$ | 1.1 | 2.0 | 2.9       | V       |
| Static Drain-Source On-Resistance | $R_{DS(on)}$ | $V_{GS}=8V, I_D=5A$           |     | 250 | 330       | m       |
|                                   |              | $V_{GS}=8V, I_D=5A, T_J=150$  |     | 500 |           |         |

| Parameter          | Symbol    | Test Conditions                        | Min | Typ | Max | Unit |
|--------------------|-----------|----------------------------------------|-----|-----|-----|------|
| Input Capacitance  | $C_{iss}$ | $V_{DS}=400V, V_{GS}=0V$<br>$f=1.0MHz$ |     | 760 |     | pF   |
| Output Capacitance | $C_{oss}$ |                                        |     | 16  |     |      |

| Parameter           | Symbol       | Test Conditions                                                        | Min | Typ | Max | Unit |
|---------------------|--------------|------------------------------------------------------------------------|-----|-----|-----|------|
| Turn-On Delay Time  | $t_{d(on)}$  | $V_{GS}=0\sim 8V$ ,<br>$V_{DS}=400V$ ,<br>$I_D=4A$ ,<br>$R_g=30\Omega$ |     | 20  |     | ns   |
| Turn-On Rise Time   | $t_r$        |                                                                        |     | 4   |     |      |
| Turn-Off Delay Time | $t_{d(off)}$ |                                                                        |     | 52  |     |      |
| Turn-Off Fall Time  | $t_f$        |                                                                        |     | 10  |     |      |
| Total Gate Charge   | $Q_g$        | $V_{GS}=0\sim 8V$ ,<br>$V_{DS}=400V$ ,<br>$I_D=4A$                     |     | 9.5 |     | nC   |
| Gate Source Charge  | $Q_{gs}$     |                                                                        |     | 2.7 |     |      |
| Gate Drain Charge   | $Q_{gd}$     |                                                                        |     | 2.5 |     |      |
| Output Charge       | $Q_{OSS}$    | $V_{GS}=0V, V_{DS}=0\sim 400V$ ,                                       |     | 19  |     | nC   |

| Parameter               | Symbol   | Test Conditions                             | Min | Typ | Max | Unit |
|-------------------------|----------|---------------------------------------------|-----|-----|-----|------|
| Reverse Voltage         | $V_{SD}$ | $I_S=2A$ , $V_{GS}=0V$                      |     | 1.2 |     | V    |
| Pulsed Current, Reverse | $I_S$    | $V_{GS} = 0V$ ; $T_C=100$<br>25% duty cycle |     |     | 4.0 | A    |
| Reverse Recovery Time   | $t_{RR}$ | $I_S=4A$ $V_{DS}=400V$<br>$di/dt=1000A/us$  |     | 15  |     | ns   |
| Reverse Recovery Charge | $Q_{RR}$ |                                             |     | 22  |     | nC   |





250N65

Note

|        |                                       |
|--------|---------------------------------------|
| BR     | Company Code                          |
| 250N65 | Product Type                          |
| ****:  | Lot No. Code, code change with Lot No |

Temperature Profile for IR Reflow Soldering(Pb-Free)

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|  |
|  |
|  |

- 1

150 180

60 90sec;
- 2

245 5

5 0.5sec;
- 3

2 10 /sec.
- Note:

1.Preheating:150~180 , Time:60~90sec.

2.Peak Temp.:245 5 , Duration:5 0.5sec.

3. Cooling Speed: 2~10 /sec.