

**/ Descriptions**

Common-Drain Dual N-Channel Enhancement MOSFET in a DFN3 2-6L Plastic Package.

**/ Features**

$V_{DS(V)}=20V$       $I_D=10A$

$R_{DS(ON)}@4.5V$  9.0m (Typ.7.8mR)

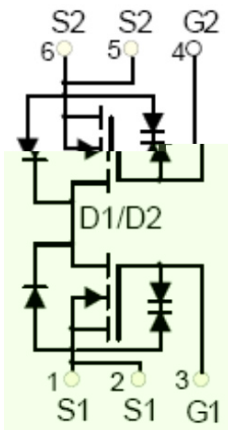
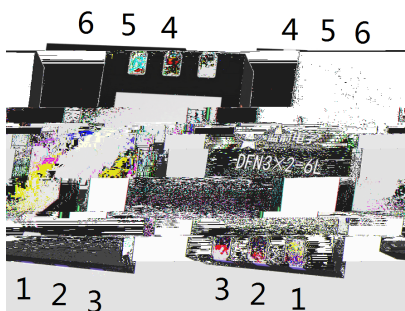
$R_{DS(ON)}@3.8V$  9.7m (Typ.8.2mR)

$R_{DS(ON)}@2.5V$  12.5m (Typ.9.5mR)  
2KV

ESD protected up to 2KV,HF Product.

**/ Applications**

Handheld Instruments,POL Applications,Battery Protection Applications.

**/ Equivalent Circuit****/ Pinning****/ Marking**

See Marking Instructions.

## / Absolute Maximum Ratings(Ta=25 )

| Parameter                               |              | Symbol         | Rating     | Unit               |
|-----------------------------------------|--------------|----------------|------------|--------------------|
| Drain-Source Voltage                    |              | $V_{DS}$       | 20         | V                  |
| Drain Current                           |              | $I_D$          | 10         | A                  |
| Drain Current - Pulsed                  |              | $I_{DM}$       | 52         | A                  |
| Gate-Source Voltage                     |              | $V_{GS}$       | $\pm 10$   | V                  |
| Power Dissipation                       |              | $P_D$          | 1.5        | W                  |
| Operating and Storage Temperature Range |              | $T_J, T_{stg}$ | -55 to 150 | $^{\circ}\text{C}$ |
| Junction-to-Ambient                     | Steady-State | $R_{JA}$       | 83.3       | /W                 |

## / Electrical Characteristics(Ta=25 )

| Parameter                         | Symbol       | Test Conditions            |                              | Min | Typ  | Max      | Unit |
|-----------------------------------|--------------|----------------------------|------------------------------|-----|------|----------|------|
| Drain-Source Breakdown Voltage    | $BV_{DS}$    | $V_{GS}=0V$                | $I_D=250\text{ A}$           | 20  | 21   |          | V    |
| Zero Gate Voltage Drain Current   | $I_{DSS}$    | $V_{DS}=20V$               | $V_{GS}=0V$                  |     |      | 1.0      | A    |
| Gate-Body leakage current         | $I_{GSS}$    | $V_{GS}=\pm 10V$           | $V_{DS}=0V$                  |     |      | $\pm 10$ | A    |
| Gate Threshold Voltage            | $V_{GS(th)}$ | $V_{DS}=V_{GS}$            | $I_D=250\text{ A}$           | 0.5 | 0.7  | 1.0      | V    |
| Static Drain-Source On-Resistance | $R_{DS(on)}$ | $V_{GS}=4.5V$              | $I_D=3A$                     |     | 7.8  | 9.0      | m    |
|                                   |              | $V_{GS}=4.0V$              | $I_D=3A$                     |     | 8.0  | 9.3      | m    |
|                                   |              | $V_{GS}=3.8V$              | $I_D=3A$                     |     | 8.2  | 9.7      | m    |
|                                   |              | $V_{GS}=3.1V$              | $I_D=3A$                     |     | 8.5  | 10.5     | m    |
|                                   |              | $V_{GS}=2.5V$              | $I_D=3A$                     |     | 9.5  | 12.5     | m    |
| Diode Forward Voltage             | $V_{SD}$     | $V_{GS}=0V$                | $I_S=1.0A$                   |     |      | 1.2      | V    |
| Input Capacitance                 | $C_{iss}$    | $V_{DS}=10V$<br>$f=1.0MHz$ | $V_{GS}=0V$                  |     | 1900 |          | pF   |
| Output Capacitance                | $C_{oss}$    |                            |                              |     | 255  |          | pF   |
| Reverse Transfer Capacitance      | $C_{rss}$    |                            |                              |     | 200  |          | pF   |
| Total Gate Charge                 | $Q_g$        | $V_{GS}=4.5V$<br>$I_D=10A$ | $V_{DS}=15V$                 |     | 17.9 |          | nC   |
| Gate-Source Charge                | $Q_{gs}$     |                            |                              |     | 1.5  |          | nC   |
| Gate-Drain Charge                 | $Q_{gd}$     |                            |                              |     | 4.7  |          | nC   |
| Turn-On Delay Time                | $t_{d(on)}$  | $V_{DS}=10V$<br>$R_L=1.35$ | $V_{GS}=5.0V$<br>$R_{GEN}=3$ |     | 2.2  |          | ns   |
| Turn-On Rise Time                 | $t_r$        |                            |                              |     | 5.9  |          | ns   |
| Turn-Off Delay Time               | $t_{d(off)}$ |                            |                              |     | 40   |          | ns   |
| Turn-Off Fall Time                | $t_f$        |                            |                              |     | 90   |          | ns   |

/ Electrical Characteristic Curve

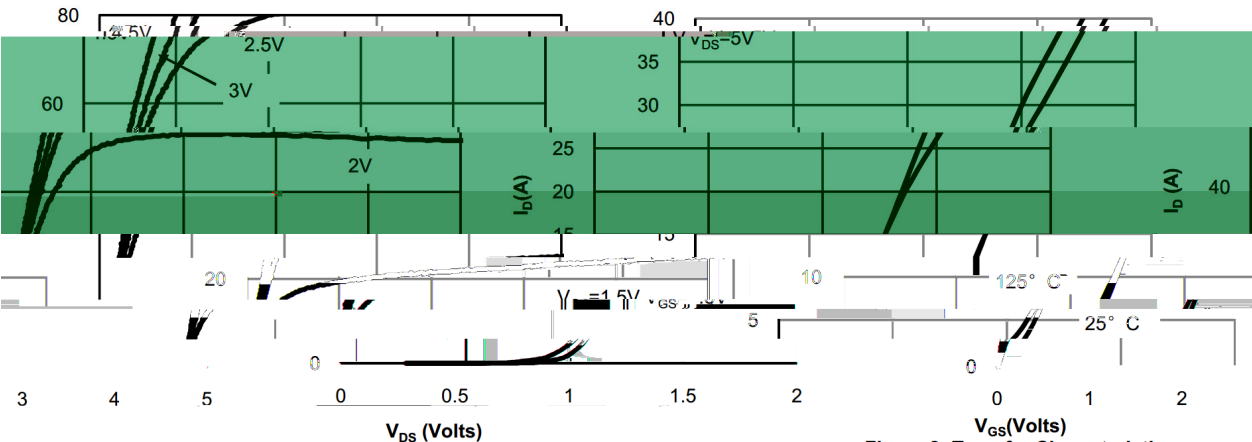


Fig 1: On-Region Characteristics

Figure 2: Transfer Characteristics

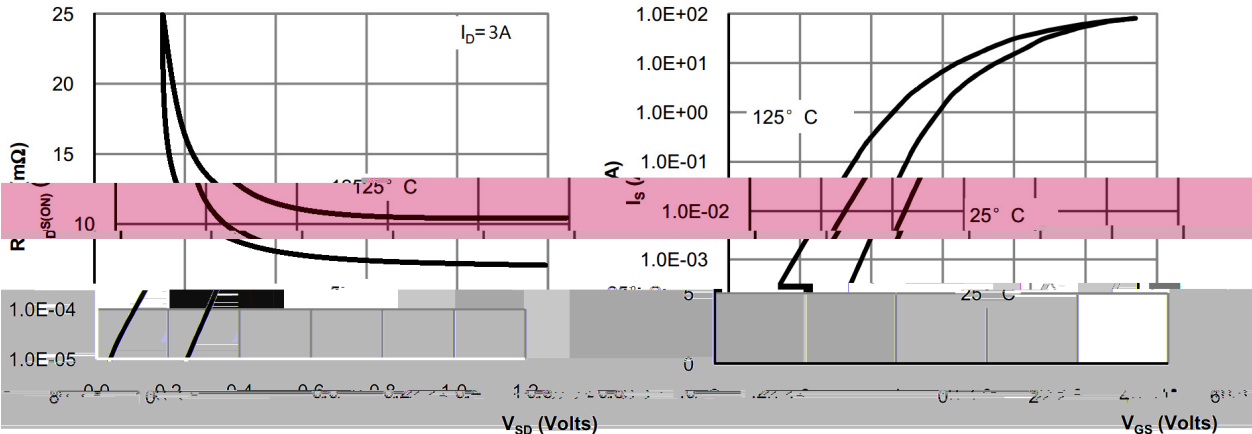
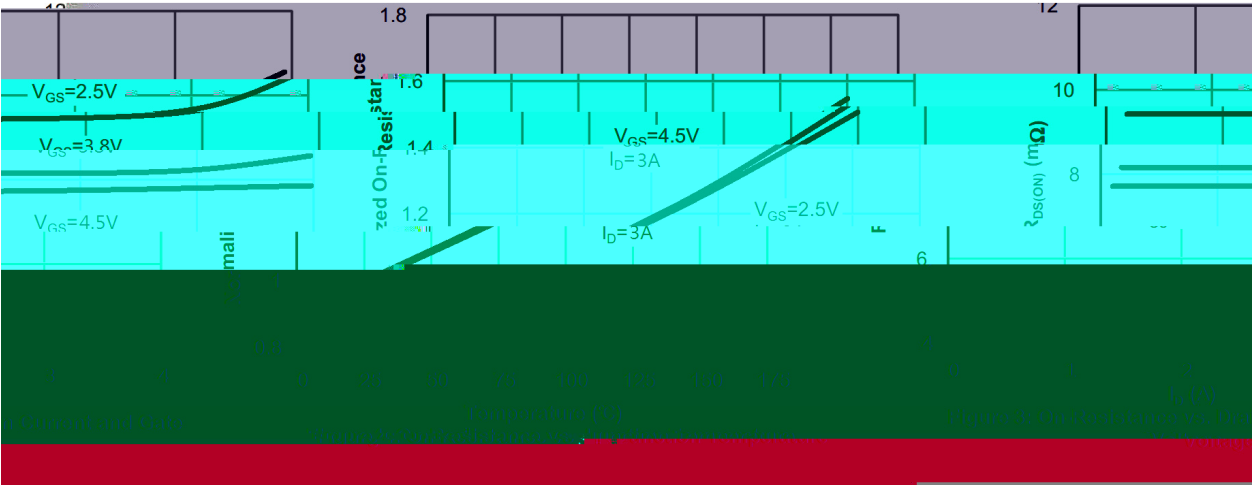
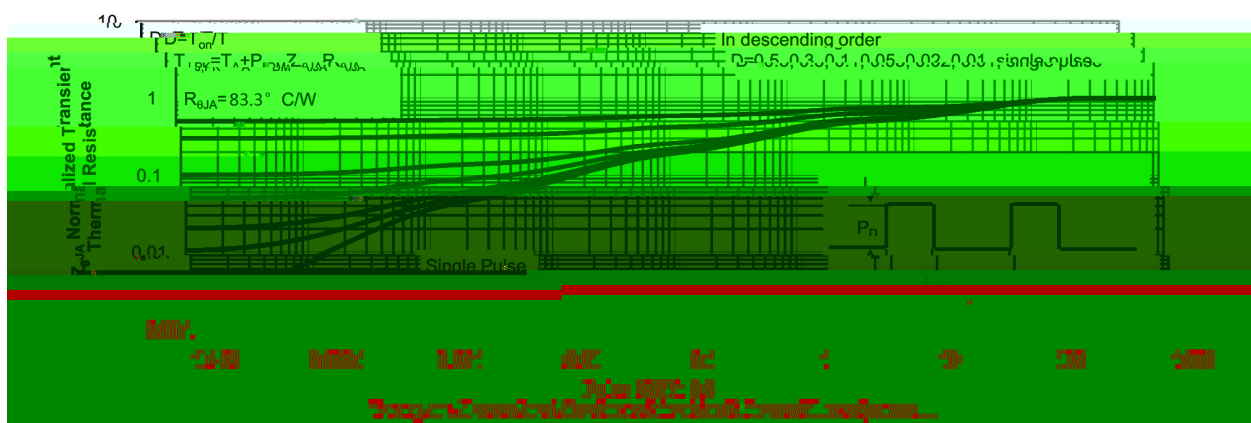
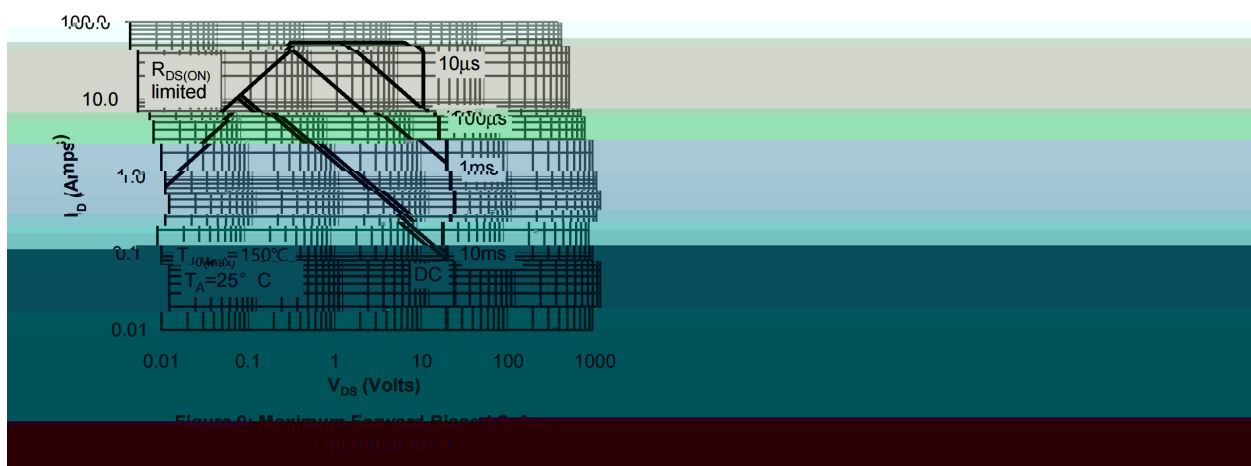
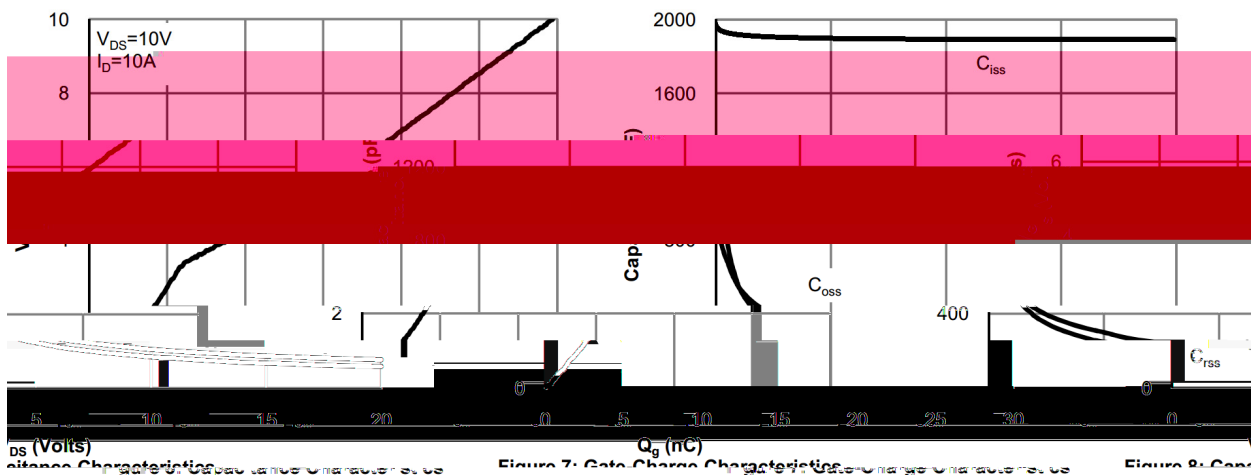


Figure 6: Body-Diode Characteristics

Figure 5: On-Resistance vs. Gate-Source Voltage

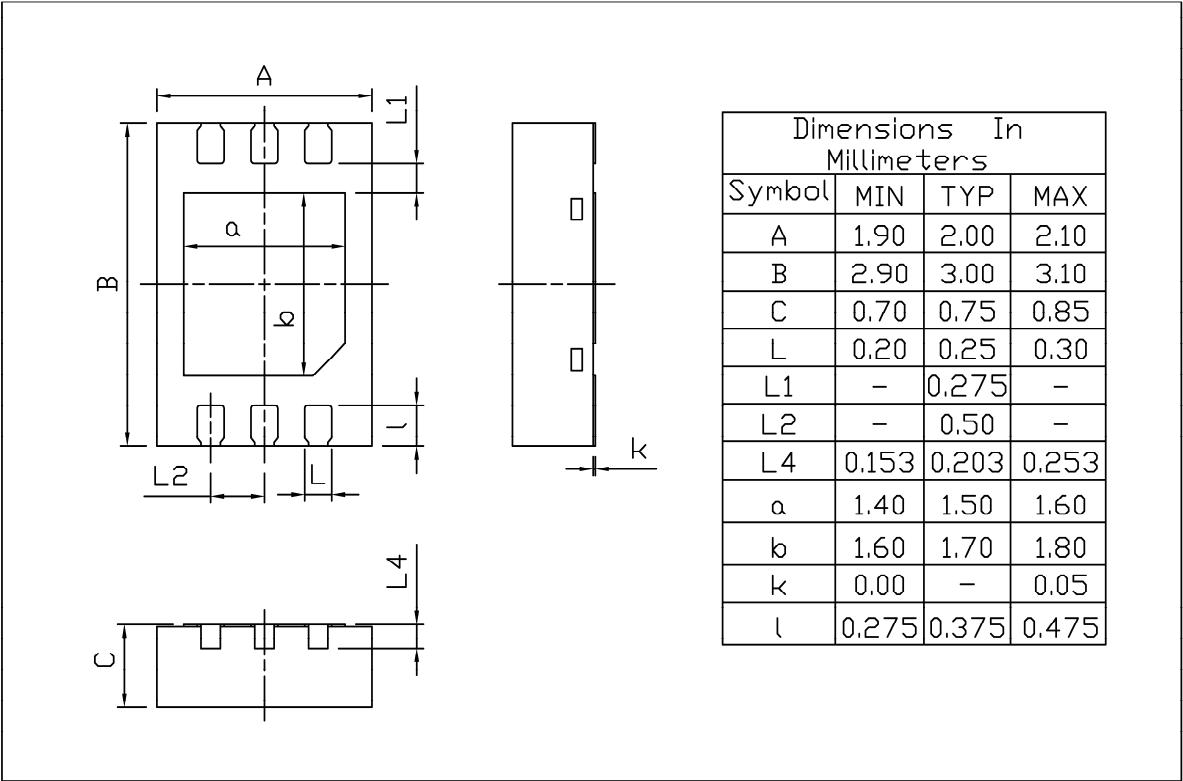
## / Electrical Characteristic Curve



/ Package Dimensions

DFN3X2-6L

Unit:mm



Rev.00 202311

/ Marking Instructions



BR

090N02E

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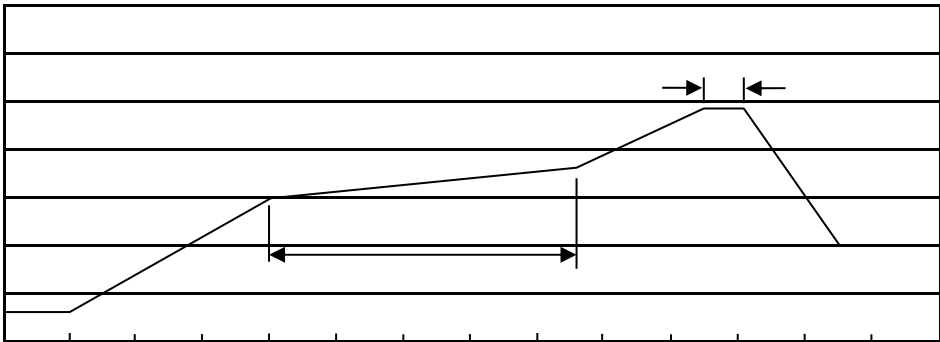
Note:

BR: Company Code

090N02E: Product Type Code

\*\*\*\*: Lot No. Code, code change with Lot No

( ) / Temperature Profile for IR Reflow Soldering(Pb-Free)



Note:

- 1

150 180

60 90sec;

1.Preheating:150~180 , Time:60~90sec.
- 2

245 5

5 0.5sec;

2.Peak Temp.:245 5 , Duration:5 0.5sec.
- 3

2 10

/sec.

3. Cooling Speed: 2~10 /sec.

/ Resistance to Soldering Heat Test Conditions

260 5                      10 1 sec.                      Temp.:260±5℃                      Time:10±1 sec

/ Packaging SPEC.

/ REEL

| Package Type | Units      |                 |                 |                       |                 | Dimension (unit mm <sup>3</sup> ) |             |             |
|--------------|------------|-----------------|-----------------|-----------------------|-----------------|-----------------------------------|-------------|-------------|
|              | Units/Reel | Reels/Inner Box | Units/Inner Box | Inner Boxes/Outer Box | Units/Outer Box | Reel                              | Inner Box   | Outer Box   |
| DFN3×2-6L    | 3,000      | 10              | 30,000          | 4                     | 120,000         | 7 ×8                              | 210×205×205 | 445×435×230 |

/ Notices