

### Product Summary

| $V_{(BR)DSS}$ | $R_{DS(on)MAX}$ | $I_D$ |
|---------------|-----------------|-------|
| 100V          | 32mΩ@10V        | 5A    |
|               | 38mΩ@4.5V       |       |

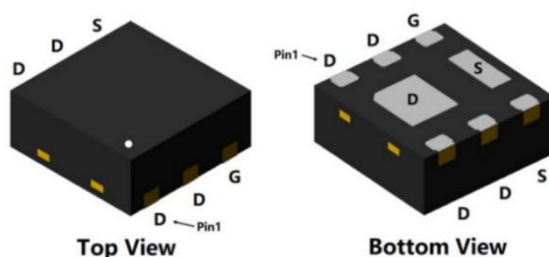
### Feature

- Low gate charge
- Low input capacitance

### Application

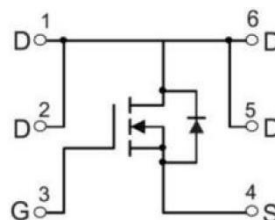
- Motor/Body Load Control
- Load Switch
- DC-DC converters
- Relay driver

### Package

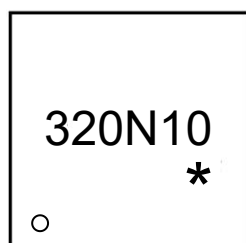


DFN2\*2-6L

### Circuit diagram



### Marking



### Absolute maximum ratings ( $T_A=25^{\circ}\text{C}$ unless otherwise noted)

| Parameter                                                 | Symbol          | Value      | Unit                 |
|-----------------------------------------------------------|-----------------|------------|----------------------|
| Drain-Source Voltage                                      | $V_{DS}$        | 100        | V                    |
| Gate-Source Voltage                                       | $V_{GS}$        | $\pm 20$   | V                    |
| Continuous Drain Current                                  | $I_D$           | 5          | A                    |
| Pulsed Drain Current <sup>1)</sup>                        | $I_{DM}$        | 20         | A                    |
| Avalanche current                                         | $I_{AS}$        | 18         | A                    |
| Single Pulse Avalanche Energy <sup>2)</sup>               | $E_{AS}$        | 13         | mJ                   |
| Power Dissipation                                         | $P_D$           | 2          | W                    |
| Thermal Resistance from Junction to Case                  | $R_{\theta JC}$ | 15         | $^{\circ}\text{C/W}$ |
| Thermal Resistance from Junction to Ambient <sup>3)</sup> | $R_{\theta JA}$ | 85         | $^{\circ}\text{C/W}$ |
| Junction Temperature                                      | $T_J$           | 150        | $^{\circ}\text{C}$   |
| Storage Temperature                                       | $T_{STG}$       | -55 ~ +150 | $^{\circ}\text{C}$   |

### Electrical characteristics ( $T_A=25^{\circ}\text{C}$ unless otherwise noted)

| Parameter                             | Symbol        | Test Condition                                               | Min. | Typ. | Max.      | Unit       |
|---------------------------------------|---------------|--------------------------------------------------------------|------|------|-----------|------------|
| Static Characteristics                |               |                                                              |      |      |           |            |
| Drain-source breakdown voltage        | $V_{(BR)DSS}$ | $V_{GS} = 0V, I_D = 250\mu A$                                | 100  |      |           | V          |
| Zero gate voltage drain current       | $I_{DSS}$     | $V_{DS} = 100V, V_{GS} = 0V$                                 |      |      | 1         | $\mu A$    |
| Gate-body leakage current             | $I_{GSS}$     | $V_{GS} = \pm 20V, V_{DS} = 0V$                              |      |      | $\pm 100$ | $\mu A$    |
| Gate threshold voltage                | $V_{GS(th)}$  | $V_{DS} = V_{GS}, I_D = 250\mu A$                            | 1.2  | 1.8  | 2.5       | V          |
| Drain-source on-resistance            | $R_{DS(on)}$  | $V_{GS} = 10V, I_D = 5A$                                     |      | 24   | 32        | m $\Omega$ |
|                                       |               | $V_{GS} = 4.5V, I_D = 4A$                                    |      | 29   | 38        |            |
| Dynamic characteristics <sup>4)</sup> |               |                                                              |      |      |           |            |
| Gate resistance                       | $R_g$         | $f = 1MHz$                                                   |      | 2    |           | $\Omega$   |
| Forward transconductance              | $g_{fs}$      | $V_{DS} = 10V, I_D = 5A$                                     |      | 19   |           | S          |
| Input capacitance                     | $C_{iss}$     | $V_{DS} = 30V, V_{GS} = 0V,$<br>$f = 1MHz$                   |      | 560  |           | pF         |
| Output capacitance                    | $C_{oss}$     |                                                              |      | 175  |           |            |
| Reverse transfer capacitance          | $C_{rss}$     |                                                              |      | 21   |           |            |
| Total Gate charge                     | $Q_g$         | $V_{DS} = 50V, I_D = 10A, V_{GS} = 10V$                      |      | 25   |           | nC         |
| Gate-Source charge                    | $Q_{gs}$      |                                                              |      | 6    |           |            |
| Gate-Drain charge                     | $Q_{gd}$      |                                                              |      | 5    |           |            |
| Turn-on delay time                    | $t_{d(on)}$   | $V_{DD} = 50V, I_D = 10A, R_g = 3\Omega,$<br>$V_{Gen} = 10V$ |      | 14   |           | nS         |
| Turn-on rise time                     | $t_r$         |                                                              |      | 12   |           |            |
| Turn-off delay time                   | $t_{d(off)}$  |                                                              |      | 23   |           |            |
| Turn-off fall time                    | $t_f$         |                                                              |      | 6    |           |            |

Notes:

- 1) Pulse Test: Pulse Width  $\leq 100\mu s$ , Duty Cycle  $\leq 2\%$ , Repetitive rating, pulse width limited by junction temperature  $T_{J(MAX)} = 150^{\circ}\text{C}$ .
- 2) Limited by  $T_{J(MAX)}$ , starting  $T_J = 25^{\circ}\text{C}$ ,  $L = 0.1\text{mH}$ ,  $R_g = 25\Omega$ ,  $I_D = 5A$ ,  $V_{GS} = 10V$ .
- 3) Device mounted on FR-4 substrate PC board, 2oz copper, with 1-inch square copper plate in still air.
- 4) Guaranteed by design, not subject to production testing.

## Typical Characteristics

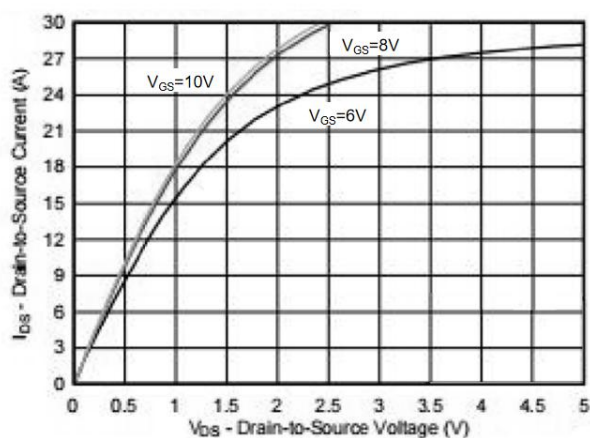


Figure 1. Saturation Characteristics

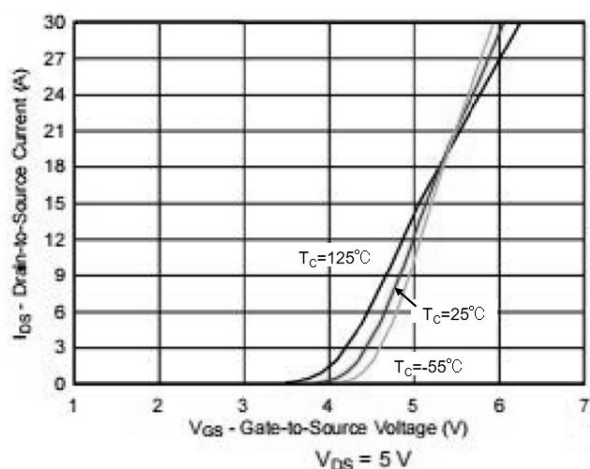


Figure 2. Transfer Characteristics

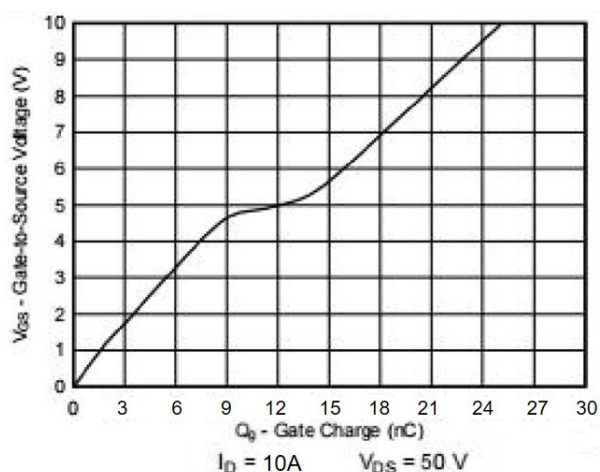


Figure 3. Gate Charge

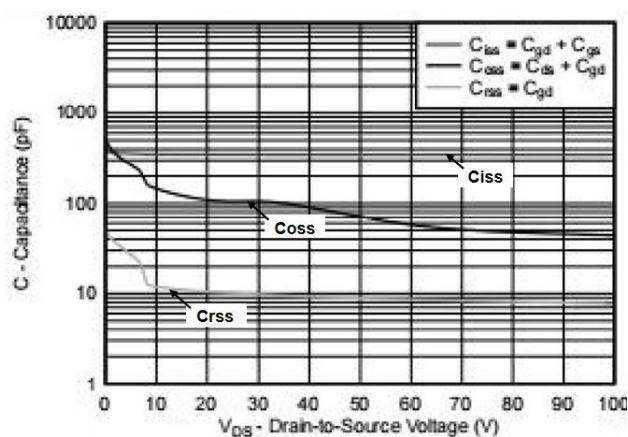


Figure 4. Capacitance

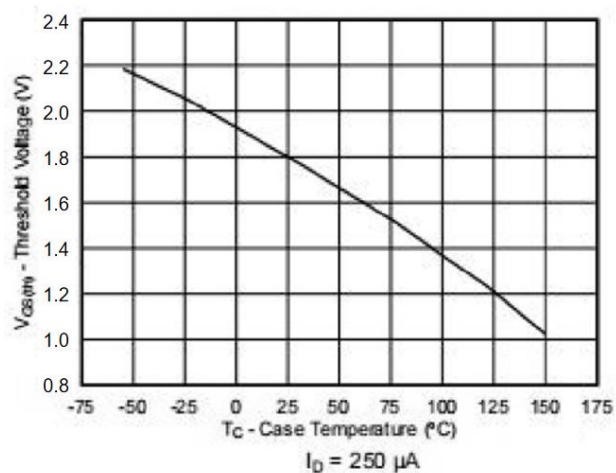


Figure 5. Threshold Voltage vs Temperature

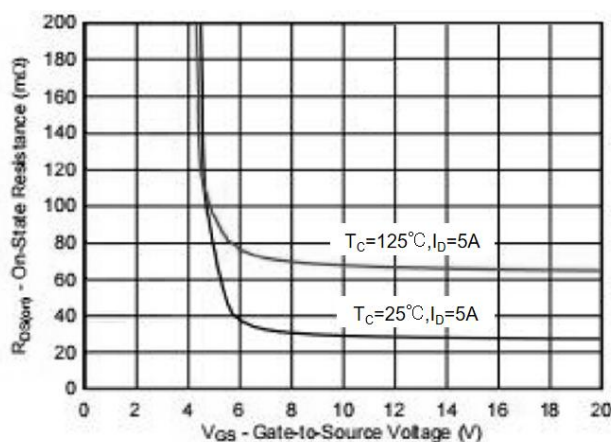


Figure 6. On-State Resistance vs Gate-to-Source Voltage

## Typical Characteristics

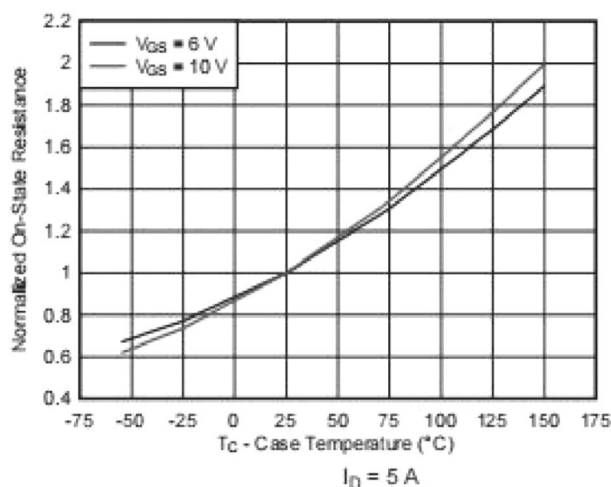


Figure 7. Normalized On-State Resistance vs Temperature

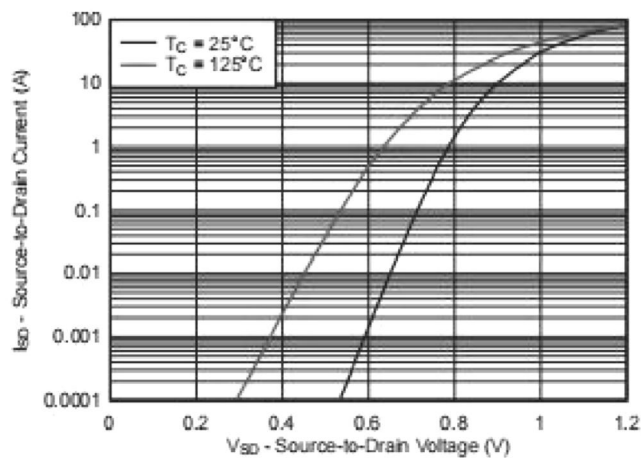


Figure 8. Typical Diode Forward Voltage

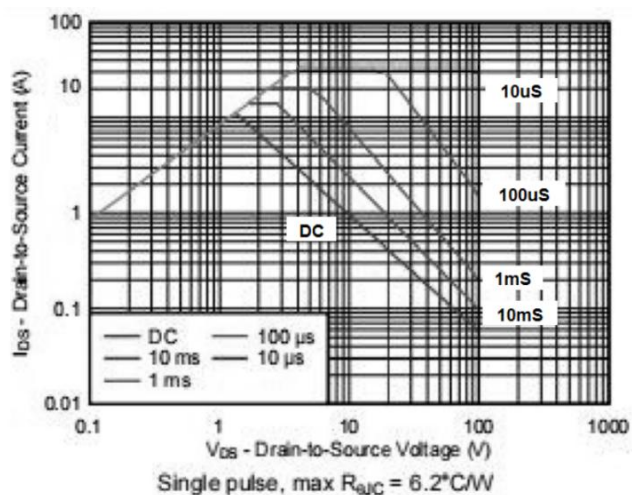


Figure 9. Maximum Safe Operating Area

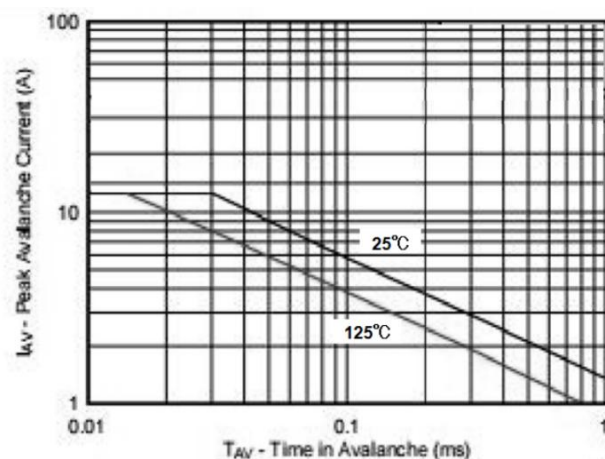


Figure 10. Single Pulse Unclamped Inductive Switching

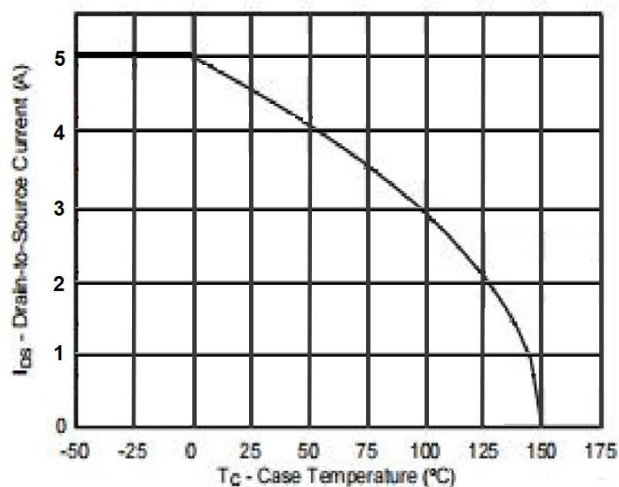
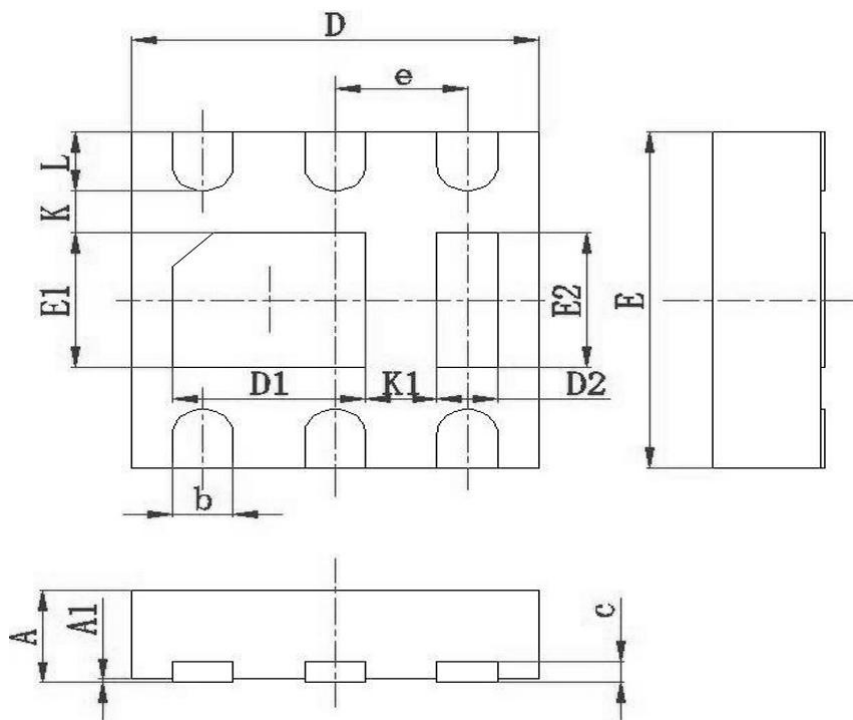


Figure 11. Maximum Drain Current Vs Temperature

## DFN2\*2-6L Package Information



| Symbol | Dimensions In Millimeters |       | Dimensions In Inches |       |
|--------|---------------------------|-------|----------------------|-------|
|        | Min.                      | Max.  | Min.                 | Max.  |
| A      | 0.500                     | 0.600 | 0.020                | 0.024 |
| A1     | 0.000                     | 0.050 | 0.000                | 0.002 |
| b      | 0.250                     | 0.350 | 0.010                | 0.014 |
| c      | 0.127 BSC.                |       | 0.005 BSC.           |       |
| D      | 1.900                     | 2.100 | 0.075                | 0.083 |
| D1     | 0.900                     | 1.000 | 0.035                | 0.039 |
| D2     | 0.250                     | 0.350 | 0.010                | 0.014 |
| e      | 0.650 BSC.                |       | 0.026 BSC.           |       |
| E      | 1.900                     | 2.100 | 0.075                | 0.083 |
| E1     | 0.750                     | 0.850 | 0.030                | 0.033 |
| E2     | 0.750                     | 0.850 | 0.030                | 0.033 |
| K      | 0.250 BSC.                |       | 0.010 BSC.           |       |
| K1     | 0.350 BSC.                |       | 0.014 BSC.           |       |
| L      | 0.300                     | 0.400 | 0.012                | 0.016 |