



### CST80N06F N-Ch 60V Fast Switching MOSFETs

- ★ Super Low Gate Charge
- ★ 100% EAS Guaranteed
- ★ Green Device Available
- ★ Excellent CdV/dt effect decline
- ★ Advanced high cell density Trench technology

#### CST80N06F Product Summary



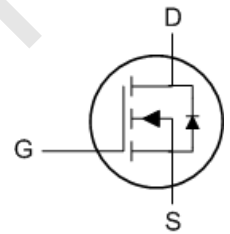
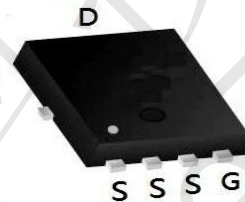
| BVDSS | RDSON | ID  |
|-------|-------|-----|
| 60V   | 6 mΩ  | 80A |

#### CST80N06F Description

The CST80N06F is the high cell density trenched N-ch MOSFETs, which provide excellent RDSON and gate charge for most of the synchronous buck converter applications.

The CST80N06F meet the RoHS and Green Product requirement 100% EAS guaranteed with full function reliability approved.

#### CST80N06F PDFN5060-8L Pin Configuration



#### CST80N06F Absolute Maximum Ratings (T<sub>c</sub>=25°C unless otherwise specified)

| Symbol                            | Parameter                                       | Max.                   | Units |
|-----------------------------------|---|------------------------|-------|
| V <sub>DSS</sub>                  | Drain-Source Voltage                            | 60                     | V     |
| V <sub>GSS</sub>                  | Gate-Source Voltage                             | ±25                    | V     |
| I <sub>D</sub>                    | Continuous Drain Current                        | T <sub>c</sub> = 25°C  | 80    |
|                                   |   | T <sub>c</sub> = 100°C | 52    |
| I <sub>DM</sub>                   | Pulsed Drain Current <sup>note1</sup>           | 320                    | A     |
| EAS                               | Single Pulsed Avalanche Energy <sup>note2</sup> | 169                    | mJ    |
| P <sub>D</sub>                    | Power Dissipation                               | T <sub>c</sub> = 25°C  | 108   |
| R <sub>θJC</sub>                  | Thermal Resistance, Junction to Case            | 1.4                    | °C/W  |
| T <sub>J</sub> , T <sub>STG</sub> | Operating and Storage Temperature Range         | -55 to +175            | °C    |



### CST80N06F N-Ch 60V Fast Switching MOSFETs

#### CST80N06F Electrical Characteristics (T<sub>J</sub>=25°C unless otherwise specified)

| Symbol  | Parameter  | Test Condition   | Min. | Typ. | Max. | Units |
|---|--|--|------|------|------|-------|
| <b>Off Characteristic</b>                                     |  |  |      |      |      |       |
| V <sub>(BR)DSS</sub>  | Drain-Source Breakdown Voltage                           | V <sub>GS</sub> =0V, I <sub>D</sub> =250μA   | 60   | -    | -    | V     |
| I <sub>DSS</sub>  | Zero Gate Voltage Drain Current                          | V <sub>DS</sub> =60V, V <sub>GS</sub> =0V,   | -    | -    | 1.0  | μA    |
| I <sub>GSS</sub>  | Gate to Body Leakage Current                             | V <sub>DS</sub> =0V, V <sub>GS</sub> =±20V   | -    | -    | ±100 | nA    |
| <b>On Characteristics</b>                                     |  |  |      |      |      |       |
| V <sub>GS(th)</sub>   | Gate Threshold Voltage                                   | V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA                                 | 2    | 3    | 4    | V     |
| R <sub>DS(on)</sub>   | Static Drain-Source on-Resistance<br>note3               | V <sub>GS</sub> =10V, I <sub>D</sub> = 30A   | -    | 6    | 7    | mΩ    |
| <b>Dynamic Characteristics</b>                                |  |  |      |      |      |       |
| C <sub>iss</sub>  | Input Capacitance  | V <sub>DS</sub> =30V, V <sub>GS</sub> =0V,<br>f=1.0MHz                                   | -    | 4136 | -    | pF    |
| C <sub>oss</sub>  | Output Capacitance                                       |  | -    | 286  | -    | pF    |
| C <sub>rss</sub>  | Reverse Transfer Capacitance                             |  | -    | 257  | -    | pF    |
| Q <sub>g</sub>  | Total Gate Charge  | V <sub>DS</sub> =30V, I <sub>D</sub> =30A,<br>V <sub>GS</sub> =10V                       | -    | 90   | -    | nC    |
| Q <sub>gs</sub>   | Gate-Source Charge                                       |  | -    | 9    | -    | nC    |
| Q <sub>gd</sub>   | Gate-Drain("Miller") Charge                              |  | -    | 18   | -    | nC    |
| <b>Switching Characteristics</b>                              |  |  |      |      |      |       |
| t <sub>d(on)</sub>  | Turn-on Delay Time                                       | V <sub>DS</sub> =30V, I <sub>D</sub> =30A,<br>R <sub>G</sub> =1.8Ω, V <sub>GS</sub> =10V | -    | 9    | -    | ns    |
| t <sub>r</sub>  | Turn-on Rise Time  |  | -    | 7    | -    | ns    |
| t <sub>d(off)</sub>   | Turn-off Delay Time                                      |  | -    | 40   | -    | ns    |
| t <sub>f</sub>  | Turn-off Fall Time                                       |  | -    | 15   | -    | ns    |
| <b>Drain-Source Diode Characteristics and Maximum Ratings</b> |  |  |      |      |      |       |
| I <sub>S</sub>  | Maximum Continuous Drain to Source Diode Forward Current |  | -    | -    | 80   | A     |
| I <sub>SM</sub>   | Maximum Pulsed Drain to Source Diode Forward Current     |  | -    | -    | 320  | A     |
| V <sub>SD</sub>   | Drain to Source Diode Forward Voltage                    | V <sub>GS</sub> =0V, I <sub>S</sub> =30A   | -    | -    | 1.2  | V     |
| t <sub>rr</sub>   | Body Diode Reverse Recovery Time                         | I <sub>F</sub> =30A, di/dt=100A/μs   | -    | 33   | -    | ns    |
| Q <sub>rr</sub>   | Body Diode Reverse Recovery Charge                       |  | -    | 46   | -    | nC    |

Notes:1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature

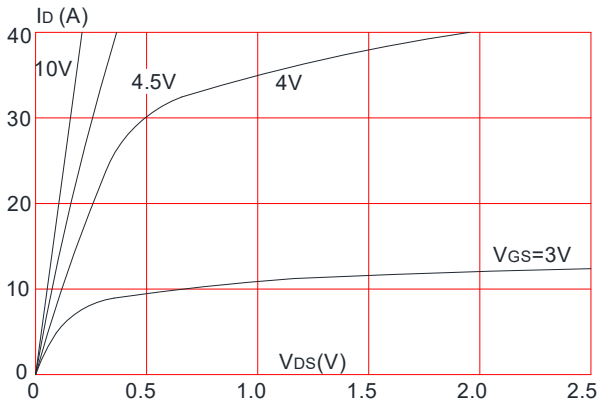
2. EAS condition : T<sub>J</sub>=25°C, V<sub>DD</sub>=30V, V<sub>G</sub>=10V, L=0.5mH, R<sub>g</sub>=25Ω, I<sub>AS</sub>=26A

3. Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%

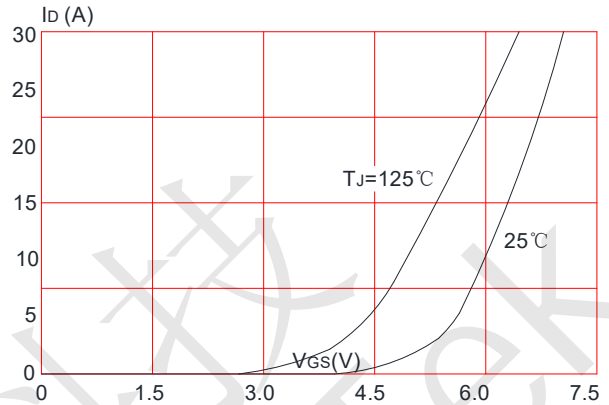


## CST80N06F Typical Performance Characteristics

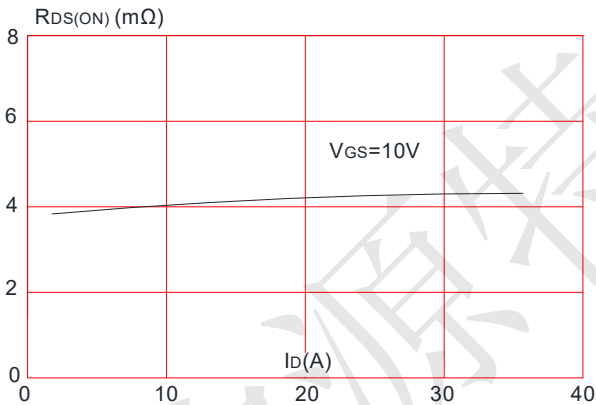
**Figure 1:** Output Characteristics



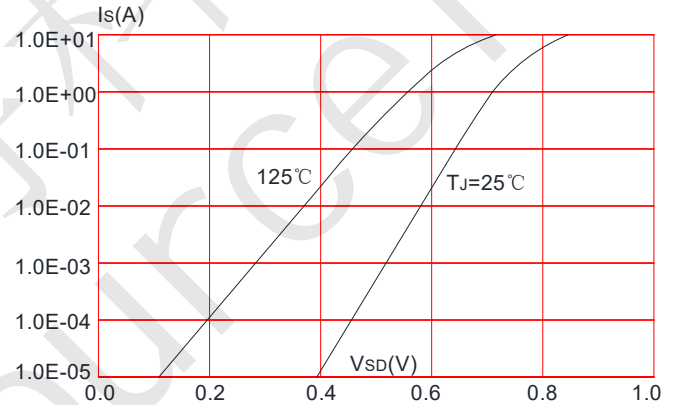
**Figure 2:** Typical Transfer Characteristics



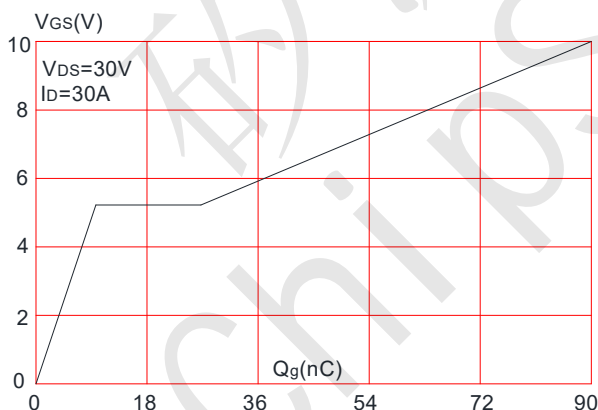
**Figure 3:** On-resistance vs. Drain Current



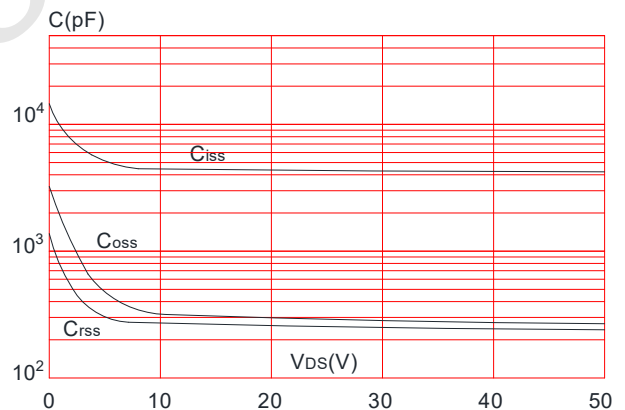
**Figure 4:** Body Diode Characteristics



**Figure 5:** Gate Charge Characteristics



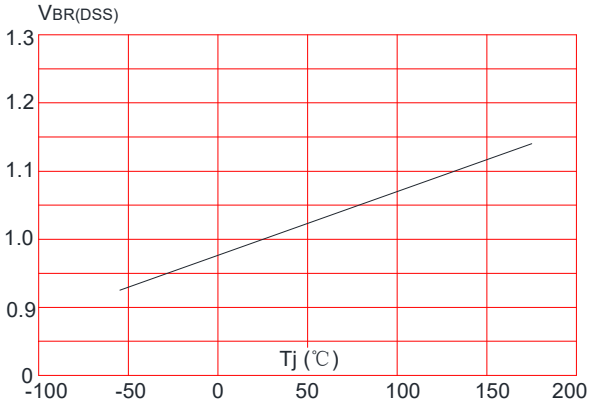
**Figure 6:** Capacitance Characteristics



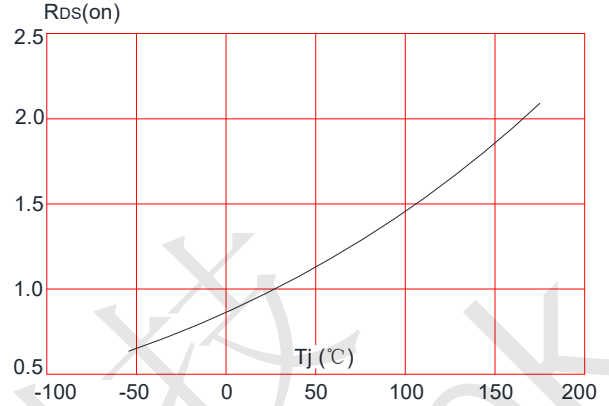


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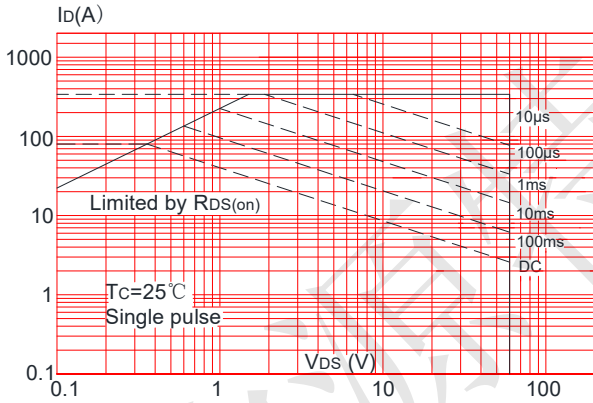
**Figure 7:** Normalized Breakdown Voltage vs. Junction Temperature



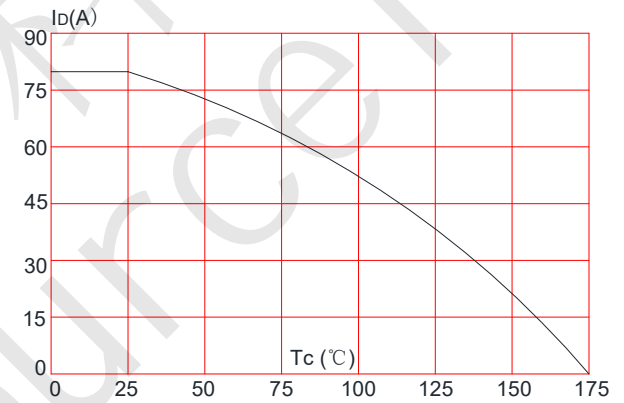
**Figure 8:** Normalized on Resistance vs. Junction Temperature



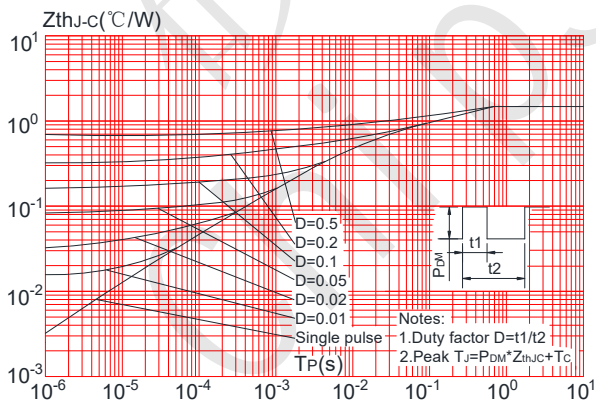
**Figure 9:** Maximum Safe Operating Area



**Figure 10:** Maximum Continuous Drain Current vs. Case Temperature

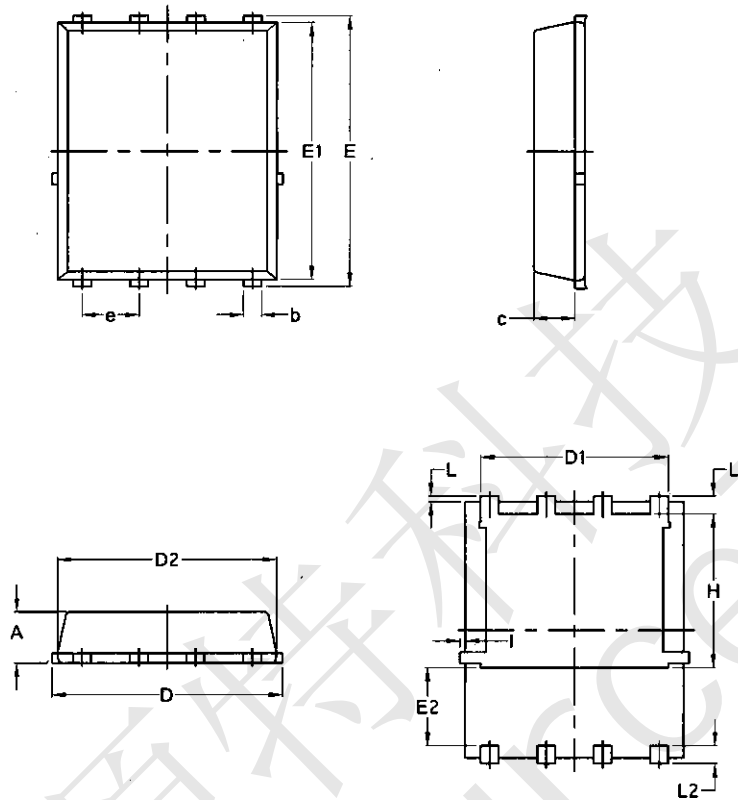


**Figure.11:** Maximum Effective Transient Thermal Impedance, Junction-to-Case





CST80N06F Package Mechanical Data PDFN5060-8L- Single



| Symbol | Common   |        |          |        |
|--------|----------|--------|----------|--------|
|        | mm       |        | Inch     |        |
|        | Min      | Max    | Min      | Max    |
| A      | 1.03     | 1.17   | 0.0406   | 0.0461 |
| b      | 0.34     | 0.48   | 0.0134   | 0.0189 |
| c      | 0.824    | 0.0970 | 0.0324   | 0.082  |
| D      | 4.80     | 5.40   | 0.1890   | 0.2126 |
| D1     | 4.11     | 4.31   | 0.1618   | 0.1697 |
| D2     | 4.80     | 5.00   | 0.1890   | 0.1969 |
| E      | 5.95     | 6.15   | 0.2343   | 0.2421 |
| E1     | 5.65     | 5.85   | 0.2224   | 0.2303 |
| E2     | 1.60     | /      | 0.0630   | /      |
| e      | 1.27 BSC |        | 0.05 BSC |        |
| L      | 0.05     | 0.25   | 0.0020   | 0.0098 |
| L1     | 0.38     | 0.50   | 0.0150   | 0.0197 |
| L2     | 0.38     | 0.50   | 0.0150   | 0.0197 |
| H      | 3.30     | 3.50   | 0.1299   | 0.1378 |
| I      | /        | 0.18   | /        | 0.0070 |