



## General Description

The ISC0805NLSATMA1 use advanced SGT MOSFET technology to provide low RDS(ON), low gate charge, fast switching and excellent avalanche characteristics. This device is specially designed to get better ruggedness.

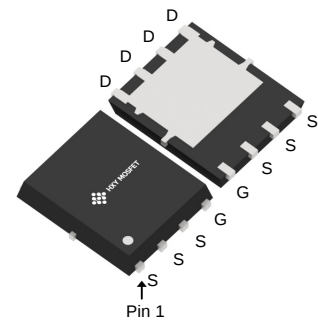
## General Features

$V_{DS} = 100V$   $I_D = 75A$

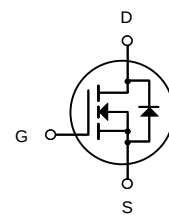
$R_{DS(ON)} < 7.5m\Omega @ V_{GS}=10V$

## Applications

Consumer electronic power supply Motor control  
Synchronous-rectification Isolated DC  
Synchronous-rectification applications



DFN5X6-8L



N-Channel MOSFET

## Package Marking and Ordering Information

| Product ID      | Pack      | Brand      | Qty(PCS) |
|-----------------|-----------|------------|----------|
| ISC0805NLSATMA1 | DFN5X6-8L | HXY MOSFET | 5000     |

## Absolute Maximum Ratings at $T_j=25^{\circ}C$ unless otherwise noted

| Parameter                                    | Symbol    | Value      | Unit          |
|----------------------------------------------|-----------|------------|---------------|
| Drain source voltage                         | VDS       | 100        | V             |
| Gate source voltage                          | VGS       | $\pm 20$   | V             |
| Continuous drain current <sup>1)</sup>       | ID        | 75         | A             |
| Pulsed drain current <sup>2)</sup>           | ID, pulse | 300        | A             |
| Power dissipation <sup>3)</sup>              | PD        | 97         | W             |
| Single pulsed avalanche energy <sup>5)</sup> | EAS       | 90         | mJ            |
| Operation and storage temperature            | Tstg, Tj  | -55 to 150 | $^{\circ}C$   |
| Thermal resistance, junction-case            | RθJC      | 1.3        | $^{\circ}C/W$ |



**Electrical Characteristics ( $T_J=25^{\circ}\text{C}$  unless otherwise specified)**

| Symbol                                                 | Parameter                                                 | Test Condition                                                                         | Min. | Typ. | Max. | Units |
|--------------------------------------------------------|-----------------------------------------------------------|----------------------------------------------------------------------------------------|------|------|------|-------|
| Off Characteristic                                     |                                                           |                                                                                        |      |      |      |       |
| V <sub>(BR)DSS</sub>                                   | Drain-Source Breakdown Voltage                            | V <sub>GS</sub> =0V, I <sub>D</sub> =250μA                                             | 100  | -    | -    | V     |
| I <sub>DSS</sub>                                       | Zero Gate Voltage Drain Current                           | V <sub>DS</sub> =100V, 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    |
| On Characteristics                                     |                                                           |                                                                                        |      |      |      |       |
| V <sub>GS(th)</sub>                                    | Gate Threshold Voltage                                    | V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA                               | 1.0  | 1.6  | 2.5  | V     |
| R <sub>DS(on)</sub>                                    | Static Drain-Source on-Resistance<br><small>note3</small> | V <sub>GS</sub> =10V, I <sub>D</sub> =20A                                              | -    | 6.4  | 7.5  | mΩ    |
|                                                        |                                                           | V <sub>GS</sub> =4.5V, I <sub>D</sub> =8A                                              | -    | 9.2  | 11.4 | mΩ    |
| Dynamic Characteristics                                |                                                           |                                                                                        |      |      |      |       |
| C <sub>iss</sub>                                       | Input Capacitance                                         | V <sub>DS</sub> =50V, V <sub>GS</sub> =0V,<br>f=1.0MHz                                 | -    | 2944 | -    | pF    |
| C <sub>oss</sub>                                       | Output Capacitance                                        |                                                                                        | -    | 736  | -    | pF    |
| C <sub>rss</sub>                                       | Reverse Transfer Capacitance                              |                                                                                        | -    | 2.04 | -    | pF    |
| Q <sub>g</sub>                                         | Total Gate Charge                                         | V <sub>DS</sub> =50V, I <sub>D</sub> =30A,<br>V <sub>GS</sub> =10V                     | -    | 39.4 | -    | nc    |
| Q <sub>gs</sub>                                        | Gate-Source Charge                                        |                                                                                        | -    | 5.6  | -    | nc    |
| Q <sub>gd</sub>                                        | Gate-Drain(“Miller”) Charge                               |                                                                                        | -    | 7.6  | -    | nc    |
| Switching Characteristics                              |                                                           |                                                                                        |      |      |      |       |
| t <sub>d(on)</sub>                                     | Turn-on Delay Time                                        | V <sub>DD</sub> =50V, I <sub>D</sub> =25A,<br>R <sub>G</sub> =6Ω, V <sub>GS</sub> =10V | -    | 13   | -    | nc    |
| t <sub>r</sub>                                         | Turn-on Rise Time                                         |                                                                                        | -    | 27.5 | -    | nc    |
| t <sub>d(off)</sub>                                    | Turn-off Delay Time                                       |                                                                                        | -    | 45.5 | -    | nc    |
| t <sub>f</sub>                                         | Turn-off Fall Time                                        |                                                                                        | -    | 41.5 | -    | nc    |
| Drain-Source Diode Characteristics and Maximum Ratings |                                                           |                                                                                        |      |      |      |       |
| I <sub>S</sub>                                         | Maximum Continuous Drain to Source Diode Forward Current  |                                                                                        | -    | -    | 75   | A     |
| I <sub>SM</sub>                                        | Maximum Pulsed Drain to Source Diode Forward Current      |                                                                                        | -    | -    | 300  | A     |
| V <sub>SD</sub>                                        | Drain to Source Diode Forward Voltage                     | V <sub>GS</sub> =0V, I <sub>S</sub> =30A                                               | -    | -    | 1    | V     |
| t <sub>rr</sub>                                        | Body Diode Reverse Recovery Time                          | T <sub>J</sub> =25°C,<br>I <sub>F</sub> =12A,dI/dt=100A/μs                             | -    | 177  | -    | ns    |
| Q <sub>rr</sub>                                        | Body Diode Reverse Recovery Charge                        |                                                                                        | -    | 1291 | -    | nc    |

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

2. EAS condition:  $T_J=25^{\circ}\text{C}$ ,  $V_{DD}=50V$ ,  $V_G=10V$ ,  $R_G=25\Omega$ ,  $L=0.5mH$ ,  $I_{AS}=19A$

3. Pulse Test: Pulse Width $\leq 300\mu s$ , Duty Cycle $\leq 0.5\%$



## Typical Performance Characteristics

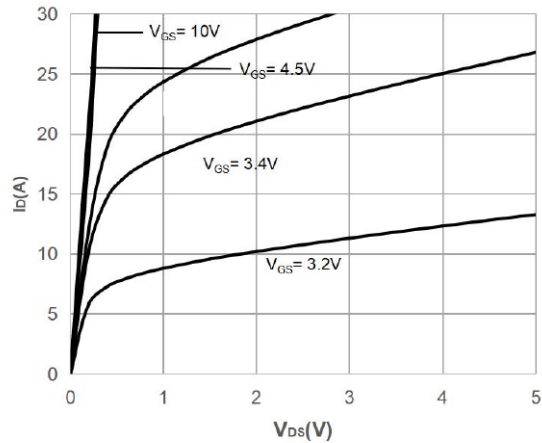


Figure 1: Output Characteristics

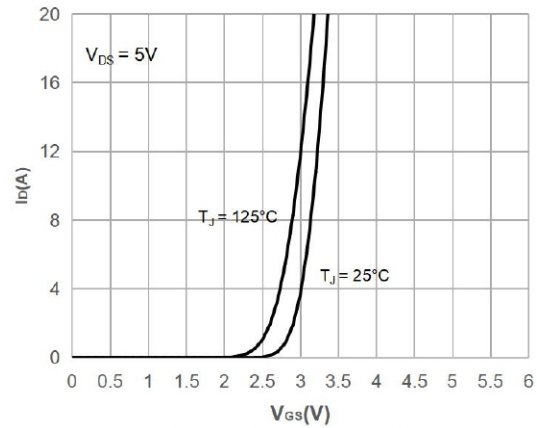


Figure 2: Typical Transfer Characteristics

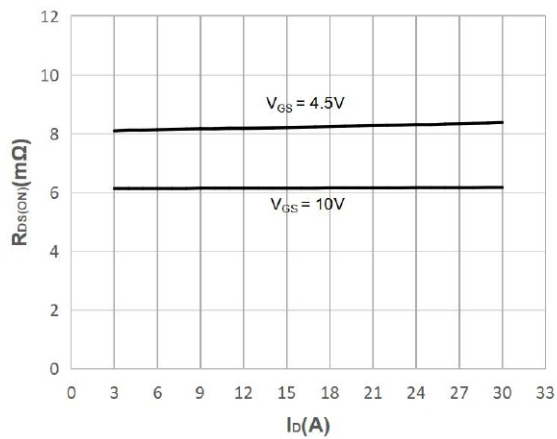


Figure 3: On-resistance vs. Drain Current

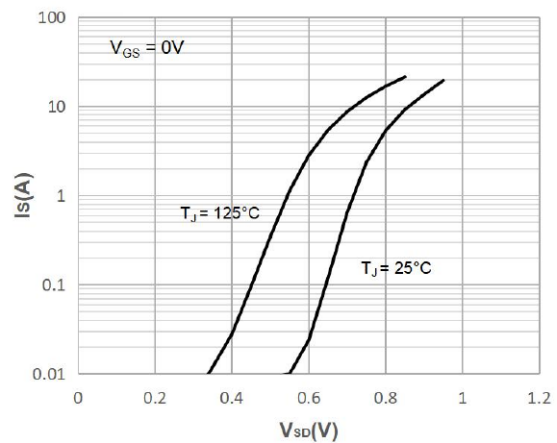


Figure 4: Body Diode Characteristics

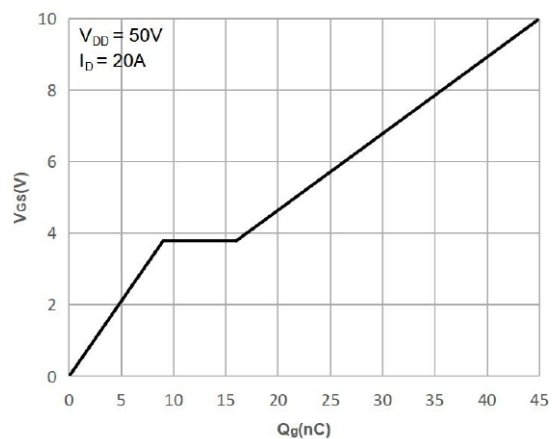


Figure 5: Gate Charge Characteristics

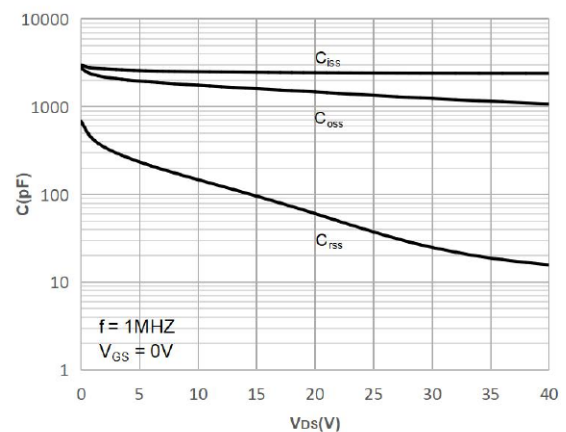


Figure 6: Capacitance Characteristics



Figure 7: Normalized Breakdown voltage vs. Junction Temperature

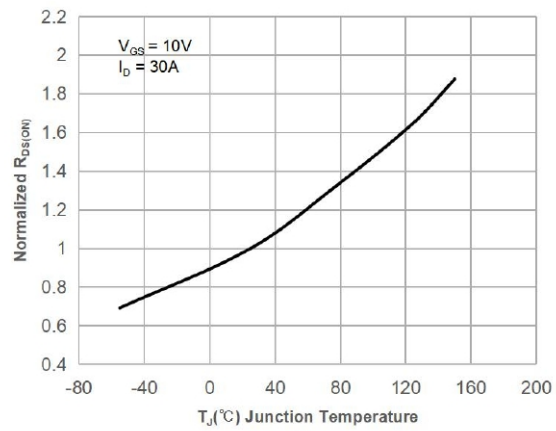


Figure 8: Normalized on Resistance vs. Junction Temperature



Figure 9: Maximum Safe Operating Area

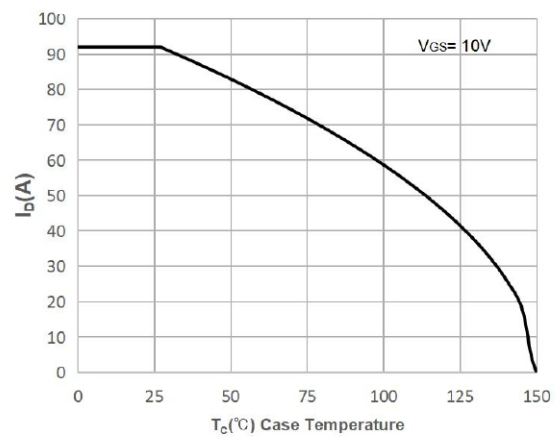


Figure 10: Maximum Continuous Drain Current vs. Case Temperature



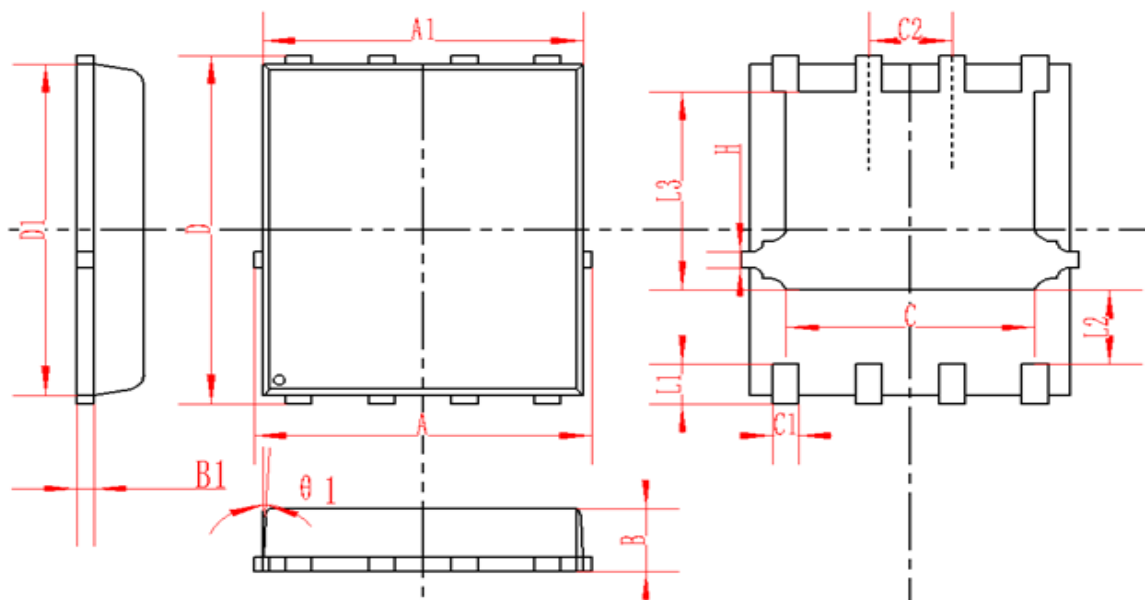
Figure 11: Normalized Maximum Transient Thermal Impedance



Figure 12: Peak Current Capacity



## DFN5X6-8L Package Information



| SYMBOL | MM       |      |       | INCH     |       |       |
|--------|----------|------|-------|----------|-------|-------|
|        | MIN      | NOM  | MAX   | MIN      | NOM   | MAX   |
| A      | 4.95     | 5    | 5.05  | 0.195    | 0.197 | 0.199 |
| A1     | 4.82     | 4.9  | 4.98  | 0.190    | 0.193 | 0.196 |
| D      | 5.98     | 6    | 6.02  | 0.235    | 0.236 | 0.237 |
| D1     | 5.67     | 5.75 | 5.83  | 0.223    | 0.226 | 0.230 |
| B      | 0.9      | 0.95 | 1     | 0.035    | 0.037 | 0.039 |
| B1     | 0.254REF |      |       | 0.010REF |       |       |
| C      | 3.95     | 4    | 4.05  | 0.156    | 0.157 | 0.159 |
| C1     | 0.35     | 0.4  | 0.45  | 0.014    | 0.016 | 0.018 |
| C2     | 1.27TYP  |      |       | 0.5TYP   |       |       |
| θ1     | 8°       | 10°  | 12°   | 8°       | 10°   | 12°   |
| L1     | 0.63     | 0.64 | 0.65  | 0.025    | 0.025 | 0.026 |
| L2     | 1.2      | 1.3  | 1.4   | 0.047    | 0.051 | 0.055 |
| L3     | 3.415    | 3.42 | 3.425 | 0.134    | 0.135 | 0.135 |
| H      | 0.24     | 0.25 | 0.26  | 0.009    | 0.010 | 0.010 |



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