



Description

The IPC100N04S5-1R2 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 and suitable.

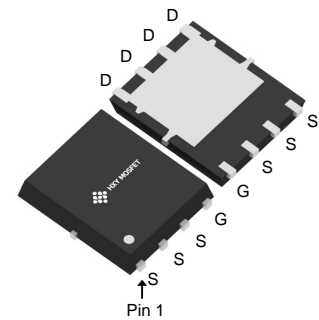
General Features

$V_{DS} = 40V$ $I_D = 219A$

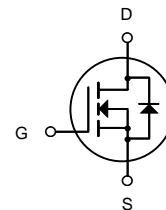
$R_{DS(ON)} < 1.5m\Omega$ $V_{GS}=10V$

Applications

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



DFN5X6-8L



N-Channel MOSFET

Ordering Information

| Product ID | Pack | Brand | Qty(PCS) |
|-----------------|-----------|------------|----------|
| IPC100N04S5-1R2 | DFN5X6-8L | HXY MOSFET | 5000 |

Absolute Maximum Ratings (Tc=25°C unless otherwise noted)

| Symbol | Parameter | Rating | Units |
|-----------------------|--|------------|-------|
| V_{DS} | Drain-Source Voltage | 40 | V |
| V_{GS} | Gate-Source Voltage | ± 20 | V |
| $I_D@T_C=25^\circ C$ | Continuous Drain Current, $V_{GS} @ 10V^1$ | 219 | A |
| $I_D@T_C=100^\circ C$ | Continuous Drain Current, $V_{GS} @ 10V^1$ | 138 | A |
| I_{DM} | Pulsed Drain Current ⁴ | 345 | A |
| EAS | Single Pulse Avalanche Energy ⁵ | 69 | mJ |
| $P_D@T_C=25^\circ C$ | Total Power Dissipation | 114 | W |
| T_{STG} | Storage Temperature Range | -50 to 150 | °C |
| T_J | Operating Junction Temperature Range | -50 to 150 | °C |
| $R_{\theta JA}$ | Thermal Resistance Junction-Ambient ³ | 43.2 | °C/W |
| $R_{\theta JC}$ | Thermal Resistance Junction-Case | 1.1 | °C/W |



Electrical Characteristics (T_J=25°C, unless otherwise noted)

| Symbol | Parameter | Conditions | Min. | Typ. | Max | Unit |
|---|------------------------------------|--|------|------|------|------|
| Static Characteristics | | | | | | |
| BV _{DSS} | Drain Source breakdown voltage | V _{GS} =0V, I _D =250uA, T _J =25°C | 40 | - | - | V |
| I _{DSS} | Zero Gate Voltage Drain Current | V _{DS} =40V, V _{GS} =0V | - | - | 1 | uA |
| I _{GSS} | Gate-to-Source Forward Leakage | V _{GS} =±20V, V _{DS} =0V | - | - | ±100 | nA |
| On Characteristics | | | | | | |
| V _{GS(th)} | Gate Threshold Voltage | V _{DS} =V _{GS} , I _D =250uA | 1.4 | - | 2.3 | V |
| R _{DS(on)} | Static Drain-Source On-Resistance | V _{GS} =10V, I _D =20A | - | 1.2 | 1.5 | mΩ |
| | | V _{GS} =5V, I _D =20A | - | 1.7 | 2.2 | mΩ |
| R _G | Gate Resistance | f = 1 MHz | - | 1.5 | - | Ω |
| Dynamic Characteristics | | | | | | |
| C _{iss} | Input Capacitance | V _{GS} = 0V V _{DS} = 20V f = 150KHz | - | 6461 | - | pF |
| C _{oss} | Output Capacitance | | - | 3257 | - | pF |
| C _{rss} | Reverse Transfer Capacitance | | - | 196 | - | pF |
| Switching Characteristics | | | | | | |
| T _{D(on)} | Turn-on Delay Time | V _{DD} = 20V V _{GS} = 4.5V R _G = 3Ω I _D = 20A | - | 24 | - | ns |
| T _r | Turn-on Rise Time | | - | 84 | - | ns |
| T _{D(off)} | Turn-off Delay Time | | - | 62 | - | ns |
| T _f | Turn-off Fall Time | | - | 20 | - | ns |
| Q _g | Total Gate Charge | V _{DD} = 20V V _{GS} = 4.5V I _D = 20A | - | 55 | - | nC |
| Q _{gs} | Gate Source Charge | | - | 15 | - | nC |
| Q _{gd} | Gate Drain Charge | | - | 19 | - | nC |
| Drain-Source Diode Characteristics and Maximum Ratings | | | | | | |
| V _{SD} | Drain-Source Diode Forward Voltage | I _S = 50A, V _{GS} = 0V | - | 0.8 | 1.2 | V |
| T _{rr} | Reverse Recovery Time | I _S = 20A, V _{GS} = 0V di/dt = 100A/μs | - | 171 | - | ns |
| Q _{rr} | Reverse Recovery Charge | | - | 381 | - | nC |

Notes:

1. Rated according to R_{θJC}
2. Rated according to R_{θJA}
3. Surface mounted on 1 inch² FR4 board, 2 oz Cu
4. Limited by maximum T_J
5. Starting T_J = 25°C, V_{DD} = 30V, V_{GS} = 10V, L = 0.5mH
6. Pulse width limited by maximum T_J



Typical Characteristics

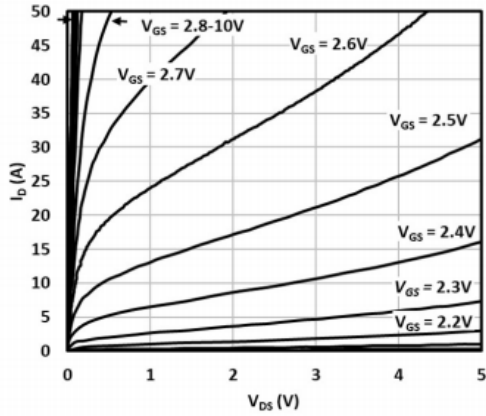


Fig. 1 Output characteristics

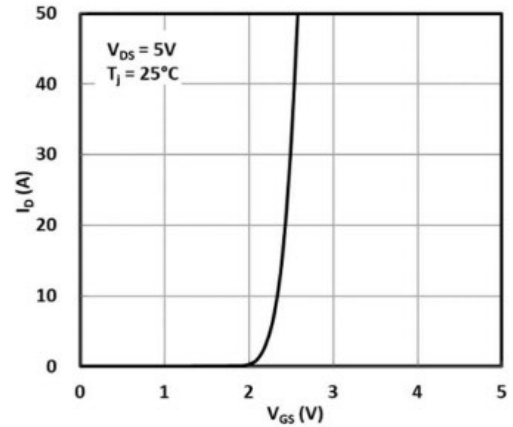


Fig. 2 Transfer characteristics

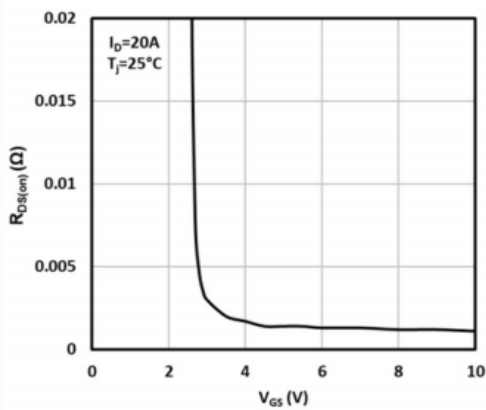


Fig.3 On-resistance vs. gate voltage

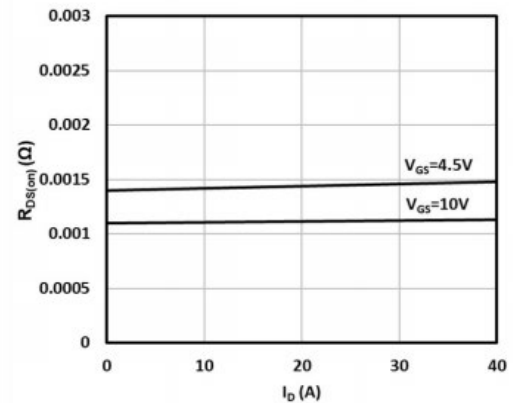


Fig.4 On-resistance vs. drain current

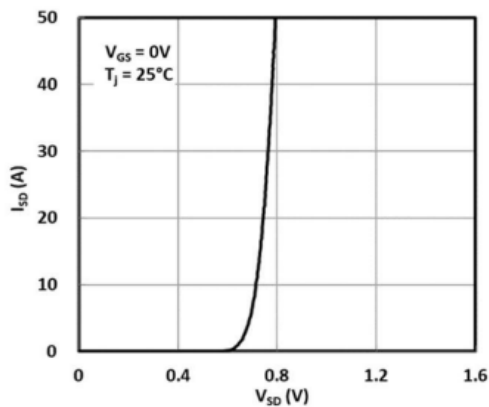


Fig.5 Source-to-drain diode forward characteristics

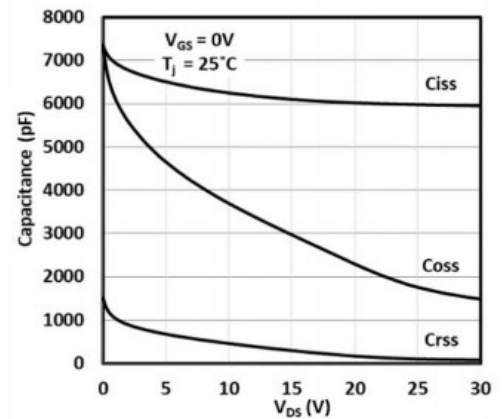


Fig.6 Capacitance vs. drain-to-source voltage

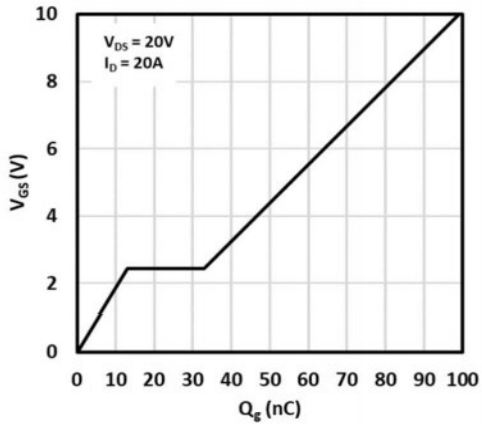


Fig.7 Gate-to-source voltage vs. gate charge

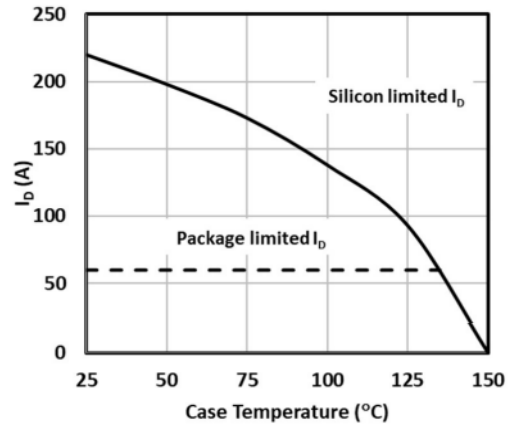


Fig.8 Maximum drain current vs. case temperature

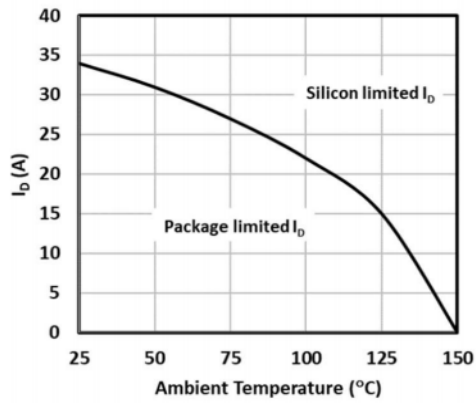
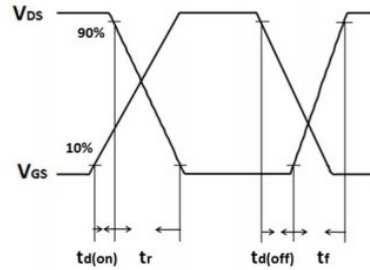
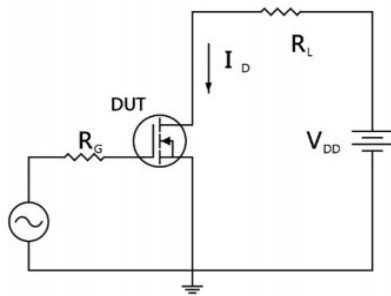


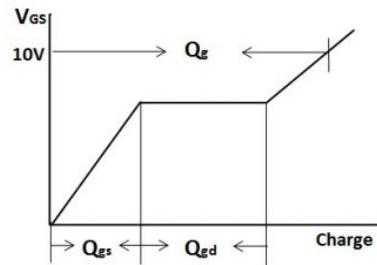
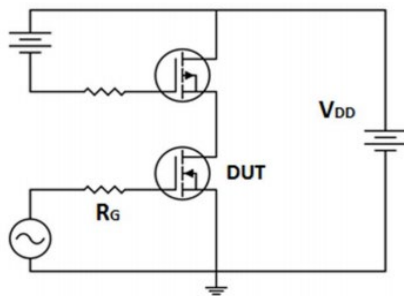
Fig. 9 Maximum drain current vs. ambient temperature



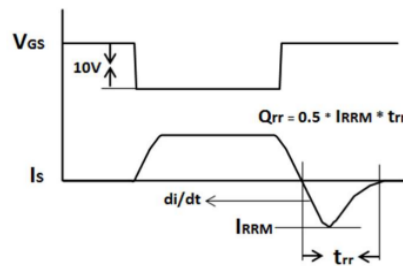
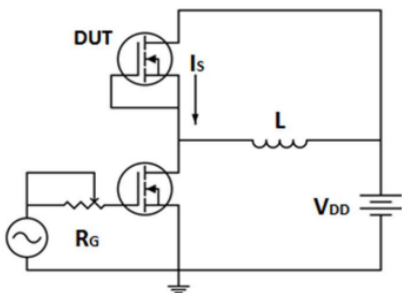
Test Circuits and Waveforms



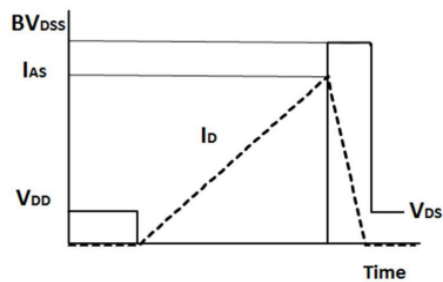
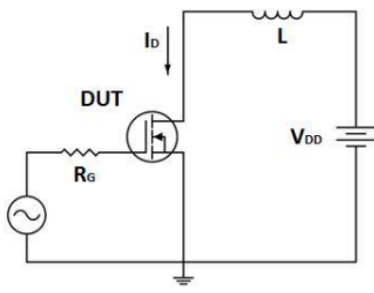
Resistive switching time test circuit & waveforms



Gate charge test circuit & waveform



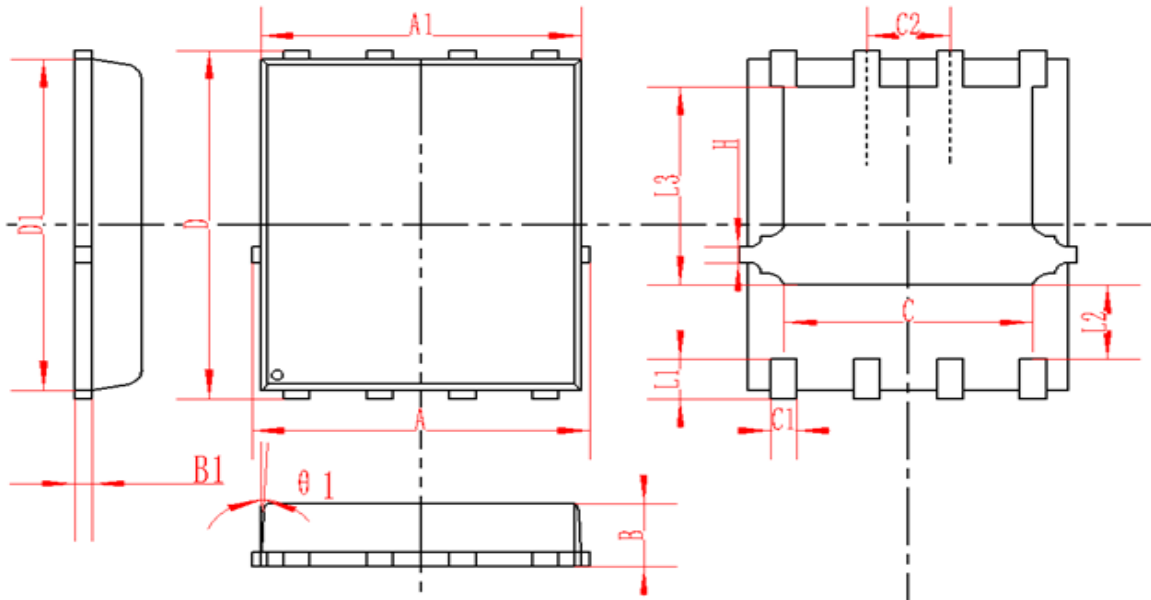
Peak diode recovery dv/dt test circuit & waveforms



Unclamped inductive switching test circuit & waveforms



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 | | |
| theta 1 | 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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