

RoHS Compliant Product
A suffix of "-C" specifies halogen & lead-free

DESCRIPTION

The SSM3024A-C is the highest performance trench N-ch MOSFETs with extreme high cell density, which provide excellent $R_{DS(ON)}$ and gate charge for most of the small power switching and load switch applications. The SSM3024A-C meet the RoHS and Green Product requirement with full function reliability approved.

FEATURES

- Advanced High Cell Density Trench Technology
- Super Low Gate Charge
- Green Device Available

MARKING



PACKAGE INFORMATION

| Package | MPQ | Leader Size |
|---------|------|-------------|
| SOT-223 | 2.5K | 13 inch |

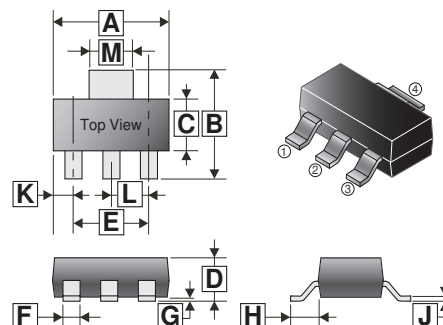
ORDER INFORMATION

| Part Number | Type |
|-------------|---------------------------------|
| SSM3024A-C | Lead (Pb)-free and Halogen-free |

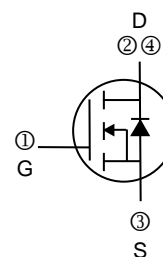
ABSOLUTE MAXIMUM RATINGS ($T_A=25^\circ\text{C}$ unless otherwise specified)

| Parameter | Symbol | Rating | Unit |
|---|-----------------|--------------------------|---------------------------|
| Drain-Source Voltage | V_{DS} | 30 | V |
| Gate-Source Voltage | V_{GS} | ± 20 | V |
| Continuous Drain Current ¹ @ $V_{GS}=10\text{V}$ | I_D | $T_C=25^\circ\text{C}$ | 8.6 |
| | | $T_C=100^\circ\text{C}$ | 5.5 |
| | | $T_A=25^\circ\text{C}$ | 5.8 |
| | | $T_A=70^\circ\text{C}$ | 4.5 |
| Pulsed Drain Current ³ | I_{DM} | 32 | A |
| Power Dissipation | P_D | $T_A=25^\circ\text{C}$ | $t \leq 5\text{sec}, 2.5$ |
| | | $T_A=25^\circ\text{C}$ | Steady State, 1.47 |
| | | $T_C=25^\circ\text{C}$ | 3.1 |
| Operating Junction & Storage Temperature | T_J, T_{STG} | -55~150 | $^\circ\text{C}$ |
| Thermal Resistance Rating | | | |
| Thermal Resistance Junction-Ambient ¹ | $R_{\theta JA}$ | $t \leq 5\text{sec}, 50$ | $^\circ\text{C/W}$ |
| | | Steady State, 85 | |
| Thermal Resistance Junction-Ambient ² | | 120 | |
| Thermal Resistance Junction-Case ¹ | $R_{\theta JC}$ | 40 | |

SOT-223



| REF. | Millimeter | | REF. | Millimeter | |
|------|------------|------|------|------------|------|
| | Min. | Max. | | Min. | Max. |
| A | 5.90 | 6.70 | G | - | 0.18 |
| B | 6.70 | 7.30 | H | 2.00 | REF. |
| C | 3.30 | 3.80 | J | 0.20 | 0.40 |
| D | 1.40 | 1.90 | K | 1.10 | REF. |
| E | 4.45 | 4.75 | L | 2.30 | REF. |
| F | 0.60 | 0.85 | M | 2.80 | 3.20 |



ELECTRICAL CHARACTERISTICS (T_J=25°C unless otherwise specified)

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Test Conditions | |
|--|---------------------|----------------------|------|------|------|--|--|
| Drain-Source Breakdown Voltage | BV _{DSS} | 30 | - | - | V | V _{GS} =0, I _D =250μA | |
| Gate-Threshold Voltage | V _{GS(th)} | 1 | - | 2.5 | V | V _{DS} =V _{GS} , I _D =250μA | |
| Forward Transconductance | g _{fs} | - | 5 | - | S | V _{DS} =5V, I _D =5A | |
| Gate-Source Leakage Current | I _{GSS} | - | - | ±100 | nA | V _{GS} = ±20V | |
| Drain-Source Leakage Current | I _{DSS} | T _J =25°C | - | - | 1 | μA | V _{DS} =24V, V _{GS} =0 |
| | | T _J =55°C | - | - | 5 | | |
| Static Drain-Source On-Resistance ⁴ | R _{DS(ON)} | - | - | 30 | mΩ | V _{GS} =10V, I _D =5A | |
| | | - | - | 42 | | V _{GS} =4.5V, I _D =4A | |
| Total Gate Charge(10V) | Q _g | - | 6 | - | nC | I _D =5A V _{DS} =15V V _{GS} =4.5V | |
| Gate-Source Charge | Q _{gs} | - | 2.5 | - | | | |
| Gate-Drain Change | Q _{gd} | - | 2.1 | - | | | |
| Turn-on Delay Time ² | T _{d(on)} | - | 2.4 | - | nS | V _{DS} =15V I _D =5A V _{GS} =10V R _G =3.3Ω | |
| Rise Time | T _r | - | 7.8 | - | | | |
| Turn-off Delay Time | T _{d(off)} | - | 22 | - | | | |
| Fall Time | T _f | - | 4 | - | | | |
| Input Capacitance | C _{iss} | - | 572 | - | pF | V _{GS} =0 V _{DS} =15V f=1MHz | |
| Output Capacitance | C _{oss} | - | 81 | - | | | |
| Reverse Transfer Capacitance | C _{rss} | - | 65 | - | | | |
| Source-Drain Diode | | | | | | | |
| Diode Forward Voltage ⁴ | V _{SD} | - | - | 1.2 | V | I _S =1A, V _{GS} =0, T _J =25°C | |
| Continuous Source Current ¹ | I _S | - | - | 5.8 | A | | |
| Pulsed Source Current ³ | I _{SM} | - | - | 32 | | | |
| Reverse Recovery Time | t _{rr} | - | 19 | - | nS | I _F =5A, dI/dt=100A/μs, T _J =25°C | |
| Reverse Recovery Charge | Q _{rr} | - | 1.04 | - | nC | | |

Notes:

- The data tested by surface mounted on a 1 inch² FR-4 board with 2oz copper.
- When mounted on Min. copper pad.
- Pulse width limited by maximum junction temperature, Pulse Width≤300μs, Duty Cycle≤2%
- Pulse Test: Pulse Width≤300μs, Duty Cycle≤2%.

CHARACTERISTIC CURVES

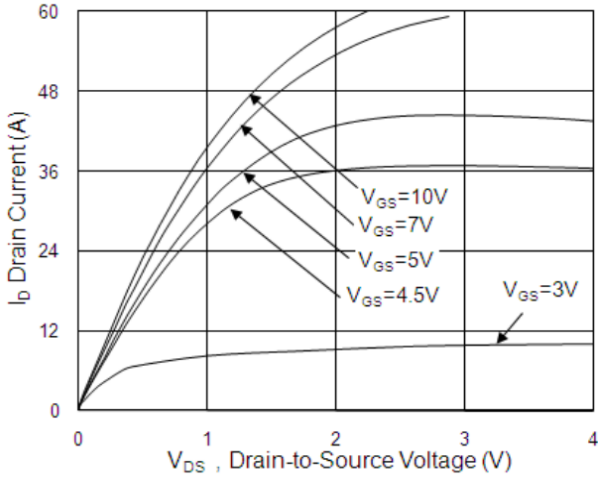


Fig.1 Typical Output Characteristics

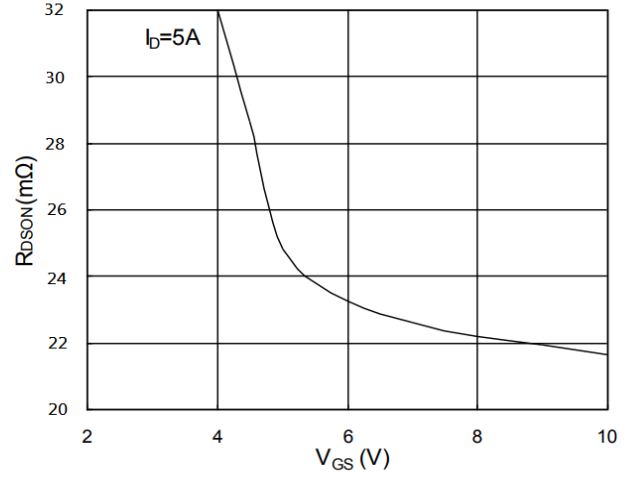


Fig.2 On-Resistance vs. Gate-Source

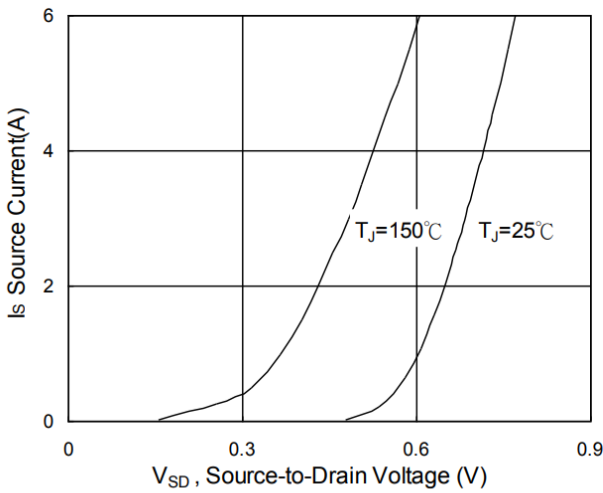


Fig.3 Forward Characteristics of Reverse

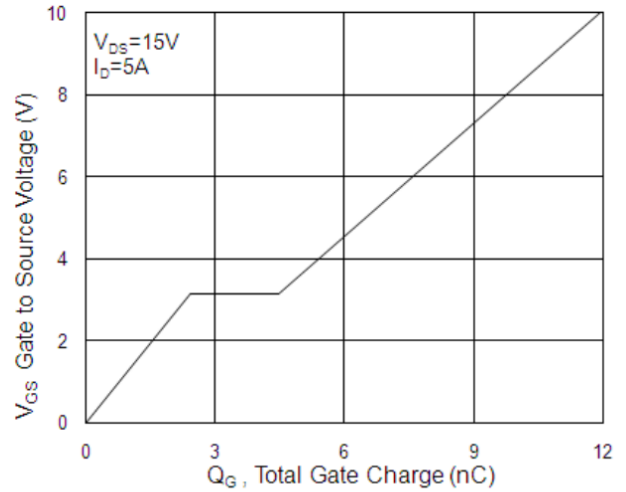


Fig.4 Gate-Charge Characteristics

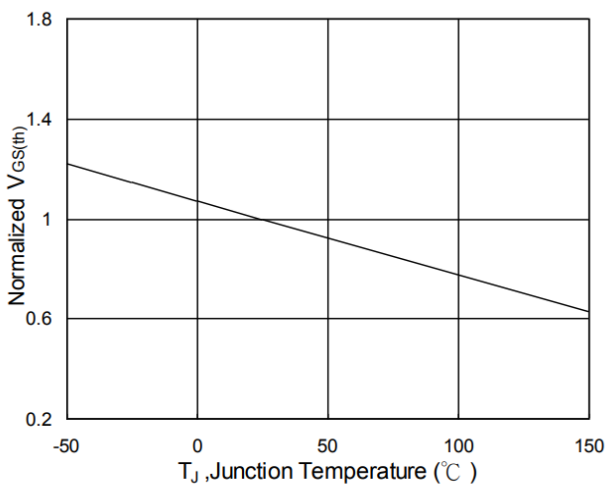


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

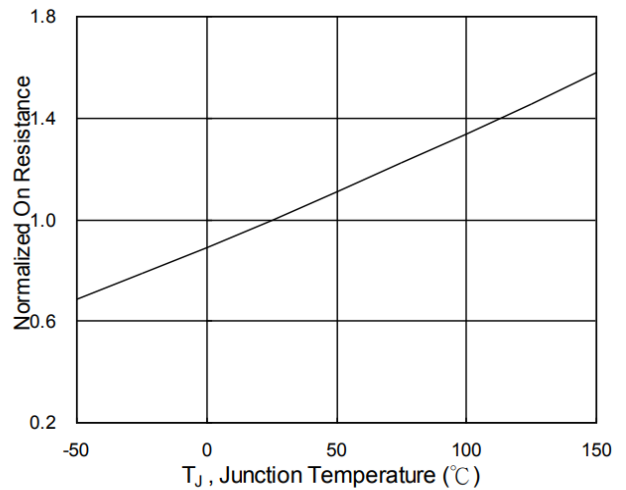


Fig.6 Normalized $R_{DS(on)}$ vs. T_J

CHARACTERISTIC CURVES

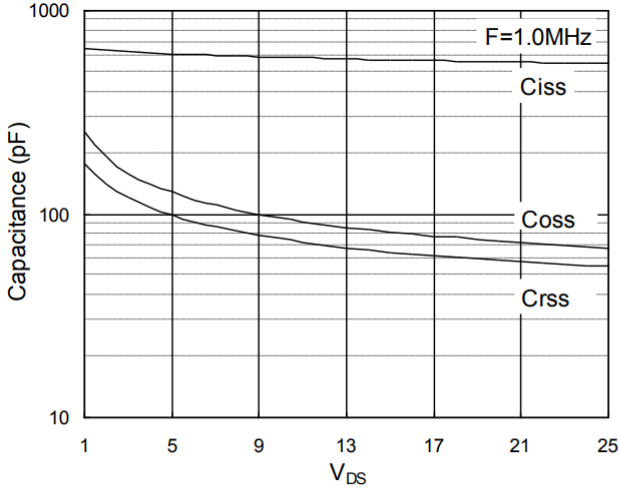


Fig.7 Capacitance

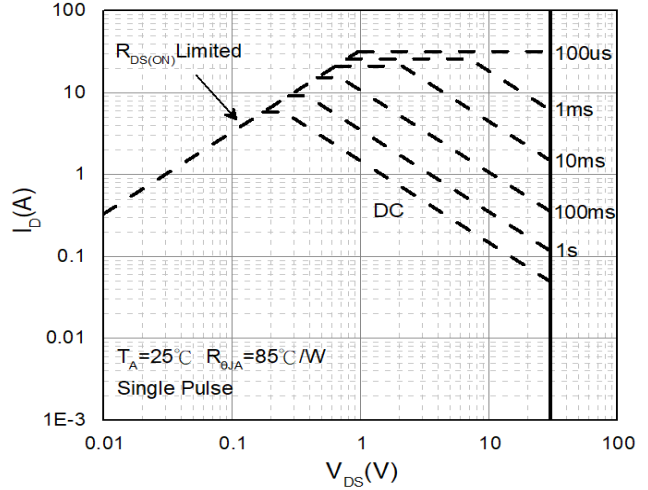


Fig.8 Safe Operating Area

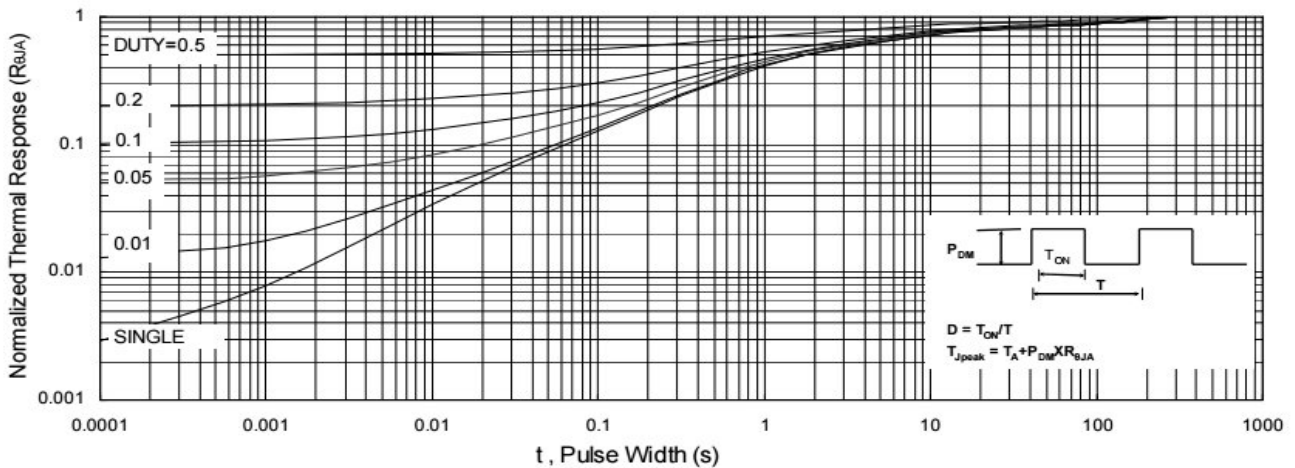


Fig.9 Normalized Maximum Transient Thermal Impedance

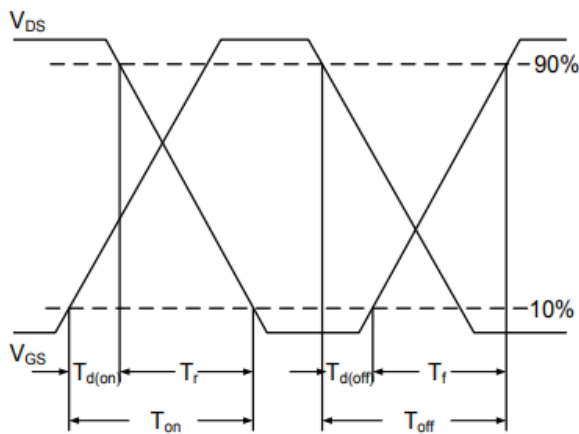


Fig.10 Switching Time Waveform

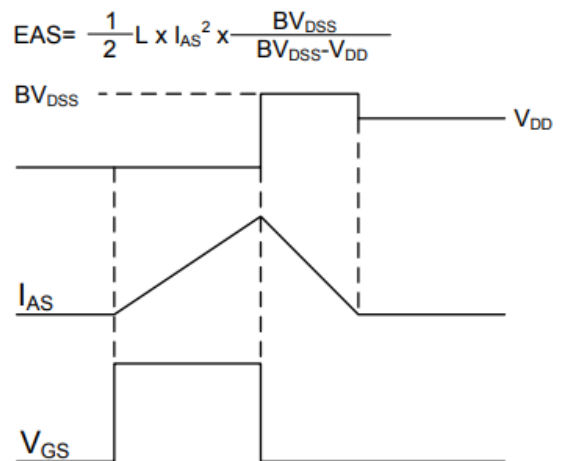


Fig.11 Unclamped Inductive Waveform

CHARACTERISTIC CURVES

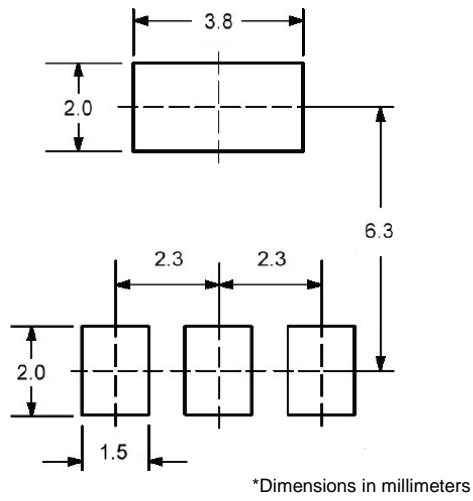


Fig.12 Mounting Pad Layout