

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

FEATURES

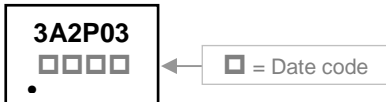
The SDT3A2P03-C is the highest performance trench P-Ch MOSFETs with extreme high cell density, which provide excellent $R_{DS(ON)}$ and gate charge for most of the synchronous buck converter applications.

The SDT3A2P03-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



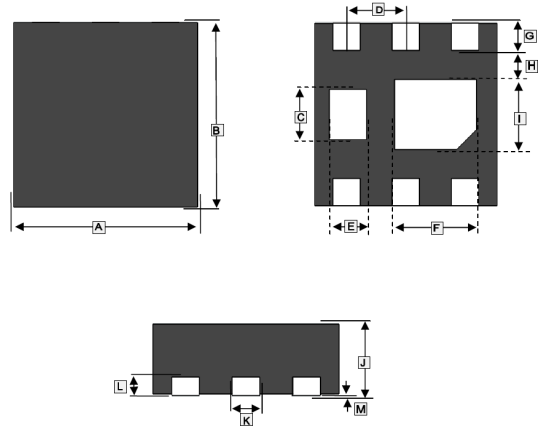
PACKAGE INFORMATION

| Package | MPQ | Leader Size |
|-----------|-----|-------------|
| DFN2x2-6J | 3K | 7 inch |

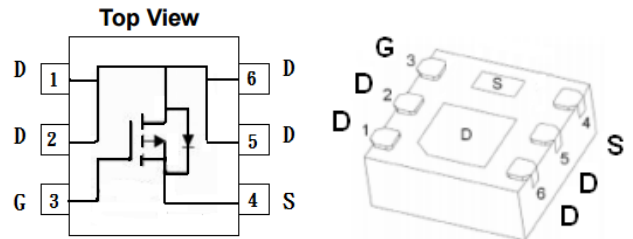
ORDER INFORMATION

| Part Number | Type |
|-------------|---------------------------------|
| SDT3A2P03-C | Lead (Pb)-free and Halogen-free |

DFN2x2-6J



| REF. | Millimeter | | REF. | Millimeter | |
|------|------------|-------|------|------------|------|
| | Min. | Max. | | Min. | Max. |
| A | 1.924 | 2.076 | H | 0.20 | - |
| B | 1.924 | 2.076 | I | 0.85 | 1.05 |
| C | 0.46 | 0.66 | J | 0.70 | 0.90 |
| D | 0.65 TYP. | | K | 0.20 | 0.40 |
| E | 0.20 | 0.40 | L | 0.203 REF | |
| F | 0.80 | 1.00 | M | 0.00 | 0.05 |
| G | 0.174 | 0.326 | | | |



ABSOLUTE MAXIMUM RATINGS

| Parameter | Symbol | Ratings | Unit |
|---|--------------------|----------|--------------|
| Drain-Source Voltage | V_{DS} | -30 | V |
| Gate-Source Voltage | V_{GS} | ± 20 | V |
| Continuous Drain Current ¹ @ $V_{GS} = -10V$ | $T_A = 25^\circ C$ | -3.2 | A |
| | $T_A = 70^\circ C$ | -2.3 | |
| Pulsed Drain Current ³ | I_{DM} | -10 | A |
| Total Power Dissipation | $T_A = 25^\circ C$ | 2 | W |
| Operating Junction & Storage Temperature Range | T_J, T_{STG} | -55~150 | $^\circ C$ |
| Thermal Resistance Ratings | | | |
| Thermal Resistance from Junction-Ambient ¹ | $R_{\theta JA}$ | 62.5 | $^\circ C/W$ |
| Thermal Resistance from Junction-Ambient ² | | 165 | |

ELECTRICAL CHARACTERISTICS ($T_J=25^\circ\text{C}$ unless otherwise specified)

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Test Conditions | |
|---|--------------|------------------------|------|-----------|------------|--|---------------------------|
| Drain-Source Breakdown Voltage | BV_{DSS} | -30 | - | - | V | $V_{GS}=0, I_D = -250\mu\text{A}$ | |
| Gate-Threshold Voltage | $V_{GS(th)}$ | -1 | - | -2.5 | V | $V_{DS}=V_{GS}, I_D = -250\mu\text{A}$ | |
| Forward Transconductance | g_{fs} | - | 3.8 | - | S | $V_{DS} = -5V, I_D = -2A$ | |
| Gate-Source Leakage Current | I_{GSS} | - | - | ± 100 | nA | $V_{GS} = \pm 20V$ | |
| Drain-Source Leakage Current | I_{DSS} | $T_J=25^\circ\text{C}$ | - | - | -1 | μA | $V_{DS} = -24V, V_{GS}=0$ |
| | | $T_J=55^\circ\text{C}$ | - | - | -5 | | |
| Drain-Source On-Resistance ⁴ | $R_{DS(ON)}$ | - | 85 | 120 | m Ω | $V_{GS} = -10V, I_D = -2A$ | |
| | | - | 120 | 170 | | $V_{GS} = -4.5V, I_D = -1A$ | |
| Total Gate Charge | Q_g | - | 2.6 | - | nC | $I_D = -2A$ $V_{DS} = -15V$ $V_{GS} = -4.5V$ | |
| Gate-Source Charge | Q_{gs} | - | 0.93 | - | | | |
| Gate-Drain Charge | Q_{gd} | - | 0.95 | - | | | |
| Turn-on Delay Time | $T_{d(on)}$ | - | 1.5 | - | nS | $V_{DS} = -15V$ $V_{GS} = -10V$ $I_D = -2A$ $R_G = 3.3\Omega$ | |
| Rise Time | T_r | - | 25 | - | | | |
| Turn-off Delay Time | $T_{d(off)}$ | - | 11 | - | | | |
| Fall Time | T_f | - | 5.2 | - | | | |
| Input Capacitance | C_{iss} | - | 203 | - | pF | $V_{GS}=0$ $V_{DS} = -15V$ $f=1\text{MHz}$ | |
| Output Capacitance | C_{oss} | - | 42 | - | | | |
| Reverse Transfer Capacitance | C_{rss} | - | 34 | - | | | |
| Source-Drain Diode Characteristics | | | | | | | |
| Continuous Source Current ¹ | I_S | - | - | -3.2 | A | | |
| Pulsed Source Current ³ | I_{SM} | - | - | -10 | | | |
| Forward on Voltage ⁴ | V_{SD} | - | - | -1.2 | V | $I_S = -1A, V_{GS}=0$ | |
| Reverse Recovery Time | t_{rr} | - | 8.3 | - | nS | $I_F = -2A, dI/dt=100A/\mu\text{s}$ | |
| Reverse Recovery Charge | Q_{rr} | - | 2 | - | nC | $T_J=25^\circ\text{C}$ | |

Notes:

- Surface Mounted on 2"x2" FR-4 Board with 2oz copper.
- When mounted on minimum pad of 2oz copper.
- Pulse width limited by maximum junction temperature, Pulse Width $\leq 10\mu\text{s}$, Duty Cycle $\leq 1\%$.
- Pulse Test: Pulse Width $\leq 300\mu\text{s}$, Duty Cycle $\leq 2\%$.

CHARACTERISTIC CURVE

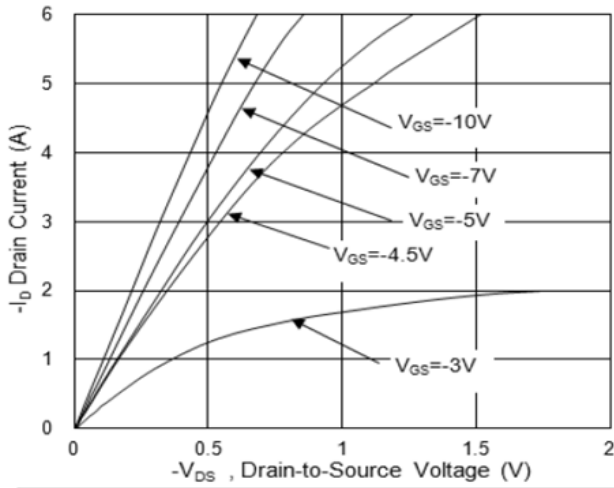


Fig.1 Typical Output Characteristics

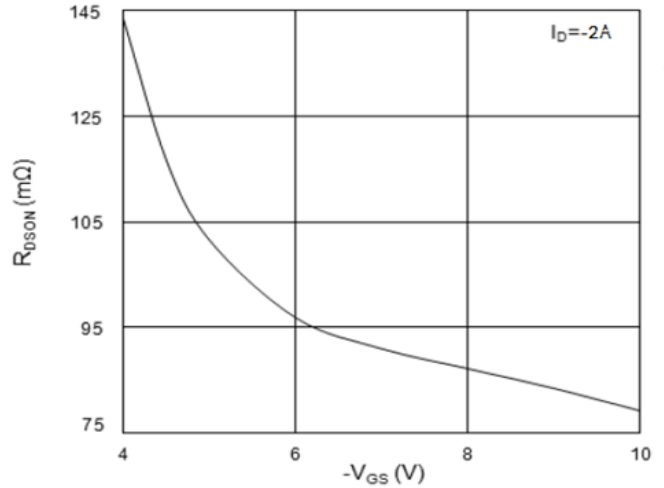


Fig.2 On-Resistance v.s Gate-Source

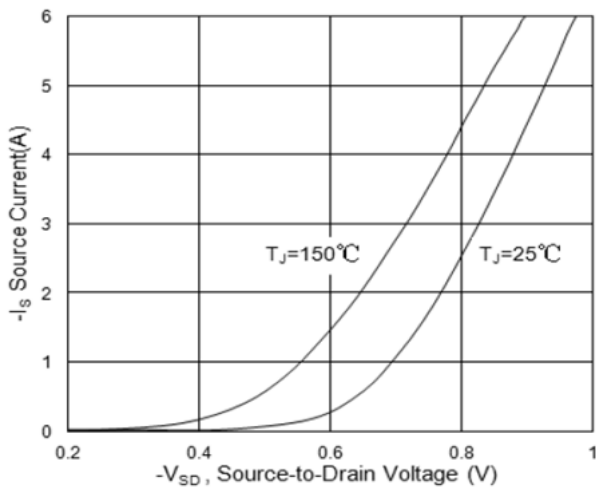


Fig.3 Forward Characteristics of Reverse

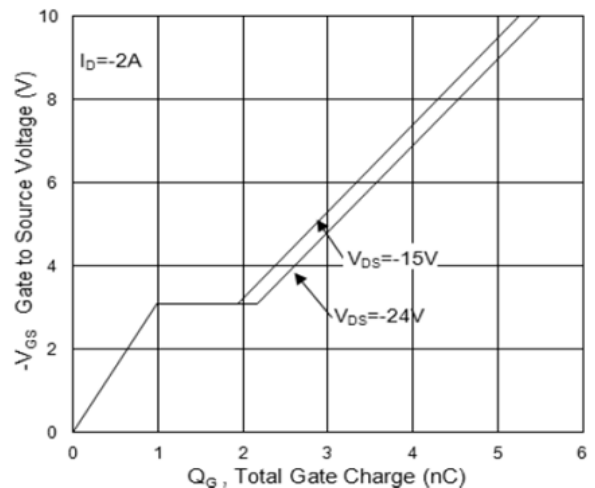


Fig.4 Gate-Charge Characteristics

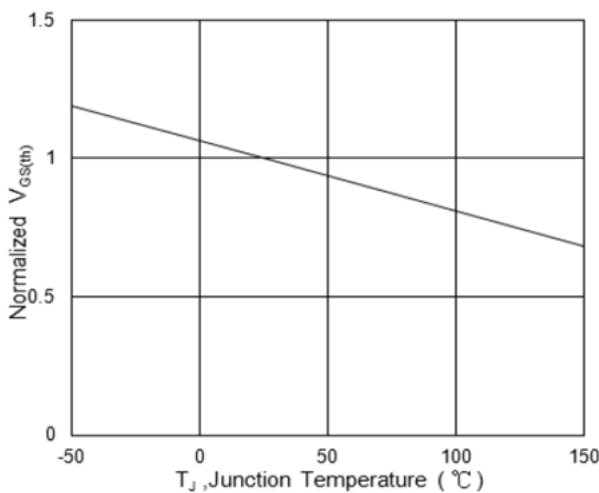


Fig.5 Normalized $V_{GS(th)}$ v.s T_J

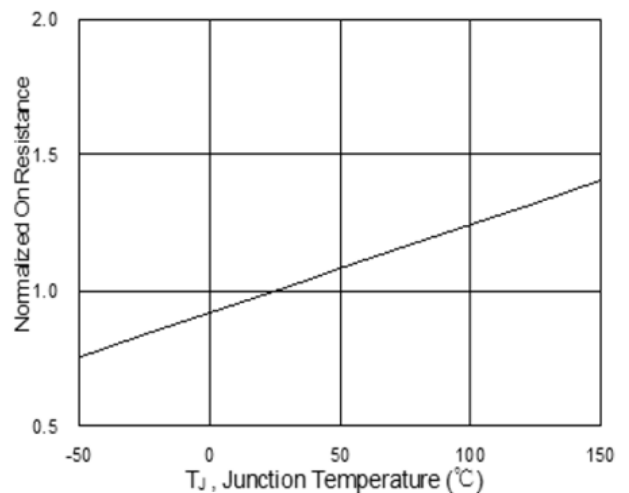


Fig.6 Normalized $R_{DS(ON)}$ v.s T_J

CHARACTERISTIC CURVE

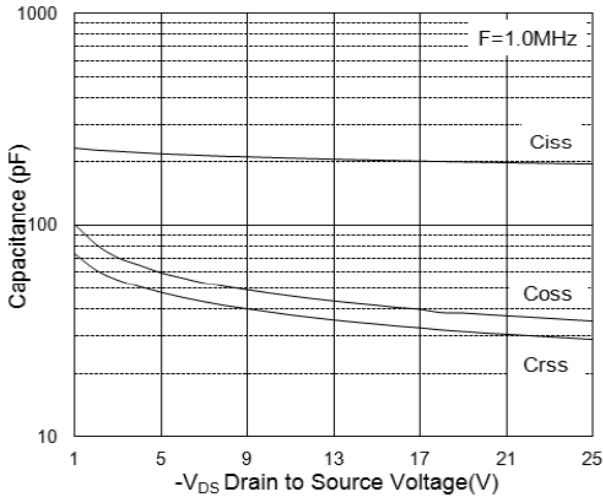


Fig.7 Capacitance

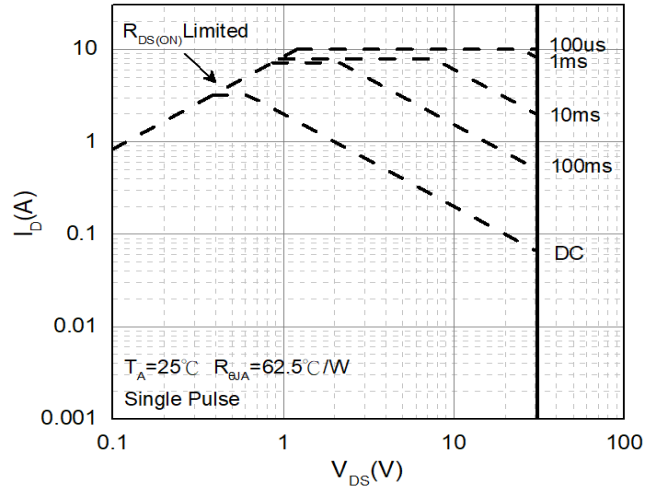


Fig.8 Safe Operating Area

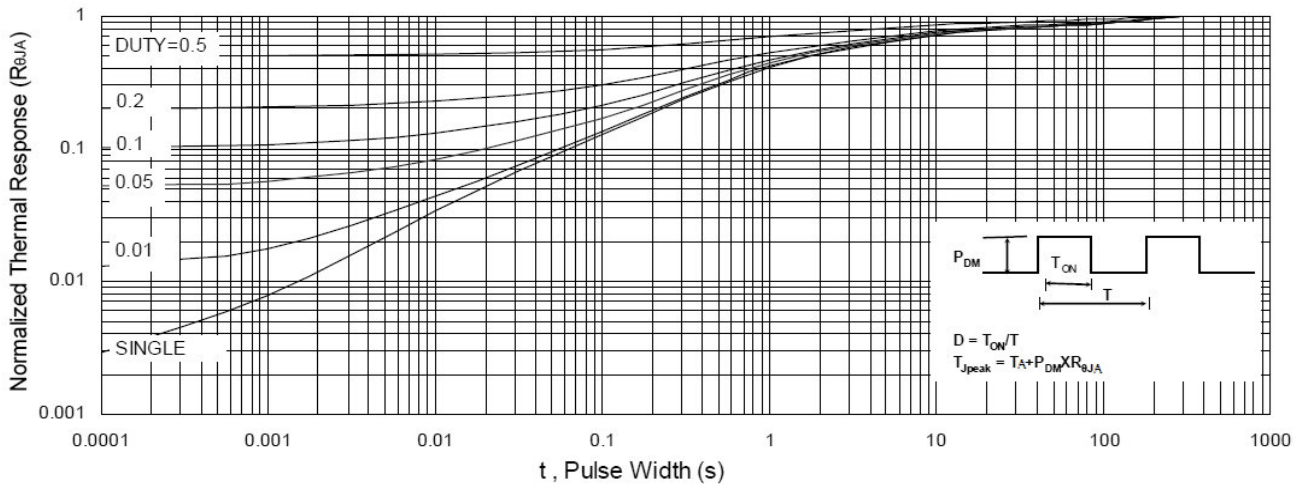


Fig.9 Normalized Maximum Transient Thermal Impedance

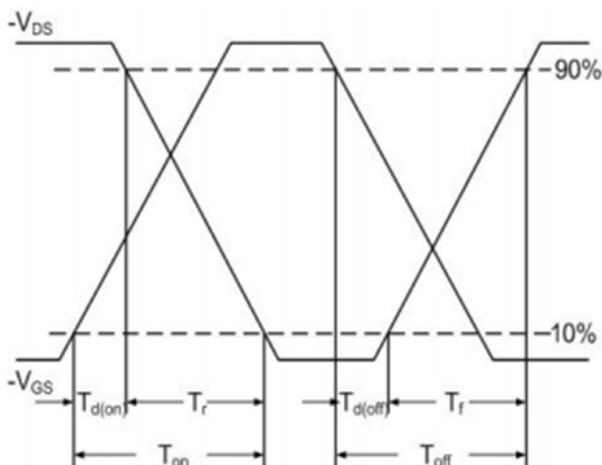


Fig.10 Switching Time Waveform

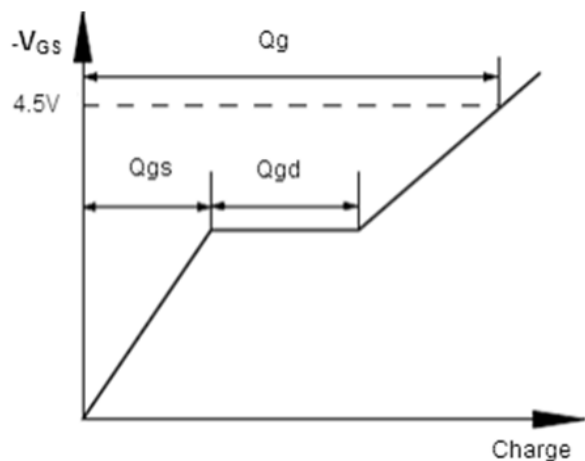


Fig.11 Gate Charge Waveform