Elektronische Bauelemente

# SSD2504

**N-Ch Enhancement Mode Power MOSFET**

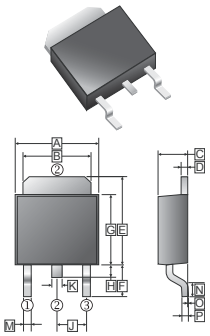
**5.0A, 100V, $R_{DS(ON)}$ 0.22Ω**

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

## DESCRIPTION

The SSD2504 provide the designer with the best combination of fast switching. The TO-252 package is universally preferred for all commercial-industrial surface mount applications. The device is suited for charger, industrial and consumer environment.

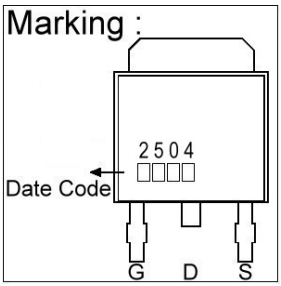
**TO-252(D-Pack)**

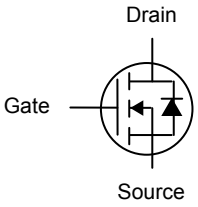


## FEATURES

- Low On-resistance
- Fast Switching Speed
- Low-voltage drive (4V)
- Wide SOA (safe operating area)
- Easily designed drive circuits
- Easy to parallel

## MARKING




| REF. | Millimeter | | REF. | Millimeter | |
|---|---|---|---|---|---|
| | Min. | Max. | | Min. | Max. |
| A | 6.4 | 6.8 | J | 2.30 REF. | |
| B | 5.20 | 5.50 | K | 0.70 | 0.90 |
| C | 2.20 | 2.40 | M | 0.50 | 1.1 |
| D | 0.45 | 0.58 | N | 0.9 | 1.6 |
| E | 6.8 | 7.3 | O | 0 | 0.15 |
| F | 2.40 | 3.0 | P | 0.43 | 0.58 |
| G | 5.40 | 6.2 | | | |
| H | 0.8 | 1.20 | | | |

## ABSOLUTE MAXIMUM RATINGS ($T_A$ = 25°C unless otherwise specified)

| PARAMETER | SYMBOL | RATINGS | UNIT |
|---|---|---|---|
| Drain-Source Voltage | $V_{DS}$ | 100 | V |
| Gate-Source Voltage | $V_{GS}$ | ±20 | V |
| Continuous Drain Current | $I_D$ @$T_C$=25℃ | 5.0 | A |
| | $I_D$ @$T_C$=100℃ | 3.75 | A |
| Pulsed Drain Current [1] | $I_{DM}$ | 20 | A |
| Total Power Dissipation | $P_D$ @$T_C$=25℃ | 20 | W |
| Linear Derating Factor | | 0.16 | W / °C |
| Operating Junction and Storage Temperature Range | $T_J$, $T_{STG}$ | -55 ~ 150 | °C |
| **THERMAL DATA** | | | |
| Maximum Thermal Resistance Junction-Ambient[a] | $R_{\theta JA}$ | 110 | °C / W |
| Maximum Thermal Resistance Junction-Case | $R_{\theta JC}$ | 6.25 | °C / W |

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

| PARAMETER | SYMBOL | MIN. | TYP. | MAX. | UNIT | TEST CONDITIONS |
|---|---|---|---|---|---|---|
| Dran-Source Breakdown Voltage | $BV_{DSS}$ | 100 | - | - | V | $V_{GS}$= 0, $I_D$= 1mA |
| Gate-Threshold Voltage | $V_{GS(th)}$ | 1.0 | - | 2.5 | V | $V_{DS}$= 10V, $I_D$ = 1mA |
| Forward Transconductance | $g_{fs}$ | - | 4 | - | S | $V_{DS}$= 10V, $I_D$= 2.5A |
| Gate-Source Leakage Current | $I_{GSS}$ | - | - | ±100 | nA | $V_{GS}$= ±20V |
| Drain-Source Leakage Current | $I_{DSS}$ | - | - | 10 | μA | $V_{DS}$= 100V, $V_{GS}$= 0V |
| Static Drain-Source On-Resistance [2] | $R_{DS(ON)}$ | - | - | 0.22 | Ω | $V_{GS}$= 10V, $I_D$= 2.5A |
| | | - | - | 0.28 | | $V_{GS}$= 4.0V, $I_D$= 2.5A |
| Turn-on Delay Time [2] | $T_{d(on)}$ | - | 9.0 | - | nS | $V_{DD}$= 30 V<br>$I_D$= 1 A<br>$V_{GS}$ = 10 V<br>$R_L$= 30 Ω<br>$R_G$= 6 Ω |
| Rise Time | $T_r$ | - | 9.4 | - | | |
| Turn-off Delay Time | $T_{d(off)}$ | - | 26.8 | - | | |
| Fall Time | $T_f$ | - | 2.6 | - | | |
| Input Capacitance | $C_{ISS}$ | - | 975 | - | pF | $V_{GS}$ = 0 V<br>$V_{DS}$ = 25 V<br>f = 1MHz |
| Output Capacitance | $C_{OSS}$ | - | 38 | - | | |
| Reverse Transfer Capacitance | $C_{RSS}$ | - | 27 | - | | |
| **SOURCE-DRAIN DIODE** | | | | | | |
| Diode Forward Voltage [2] | $V_{SD}$ | - | - | 1.5 | V | $I_S$= 5 A, $V_{GS}$= 0 V |

Notes：
1. Pulse width limited by maximum junction temperature.
2. Pulse width ≦ 300 μs, duty cycle ≦ 2%.

## CHARACTERISTIC CURVES

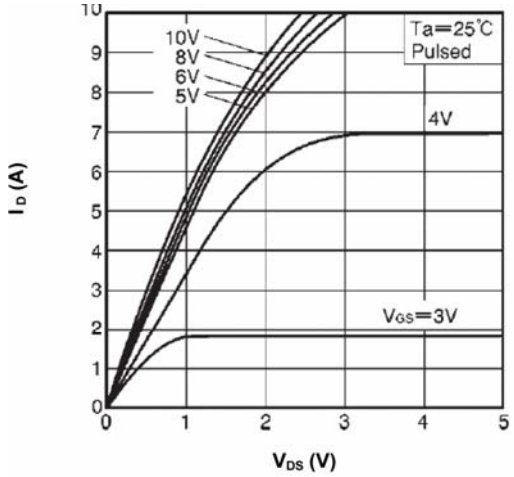



**Fig 1. Typical Output Characteristics**

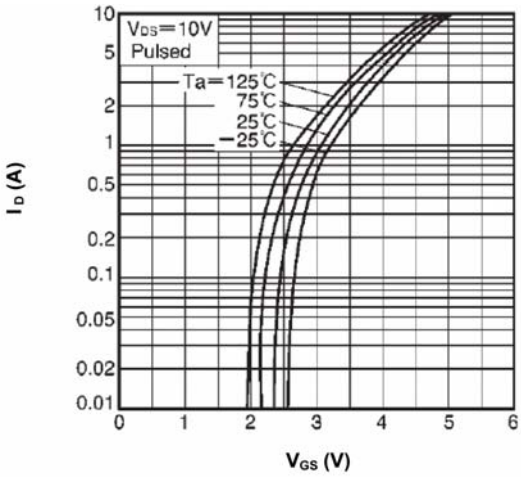



**Fig 2. Transfer Characteristics**

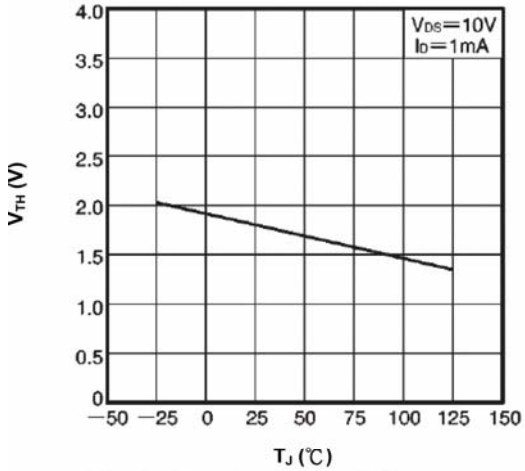



**Fig 3. Gate Threshold Voltage vs. Junction Temperature**

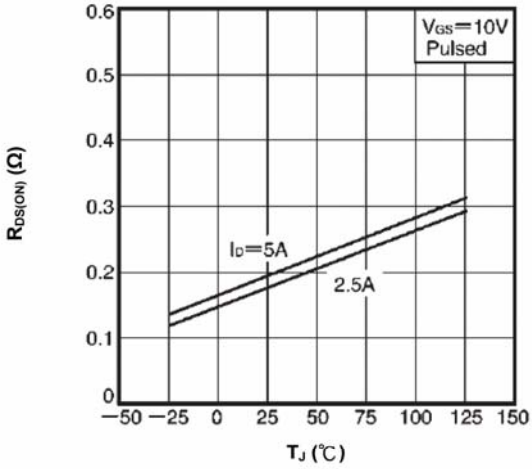



**Fig 4. On-Resistance vs. Junction Temperature**

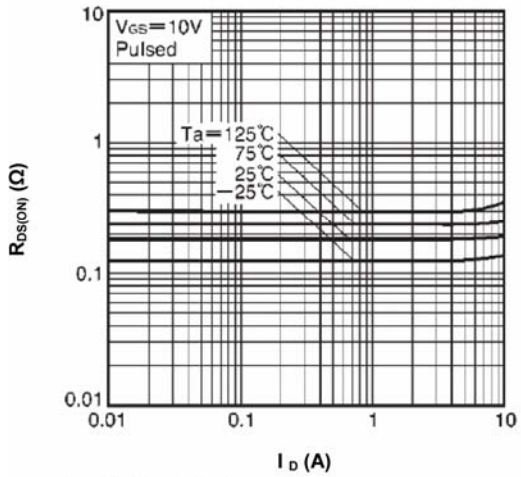



**Fig 5. On-Resistance vs. Drain Current (Ⅰ)**

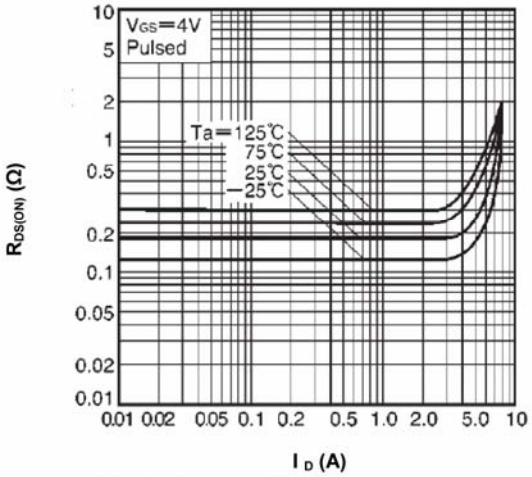



**Fig 6. On-Resistance vs. Drain Current (Ⅱ)**

## CHARACTERISTIC CURVES

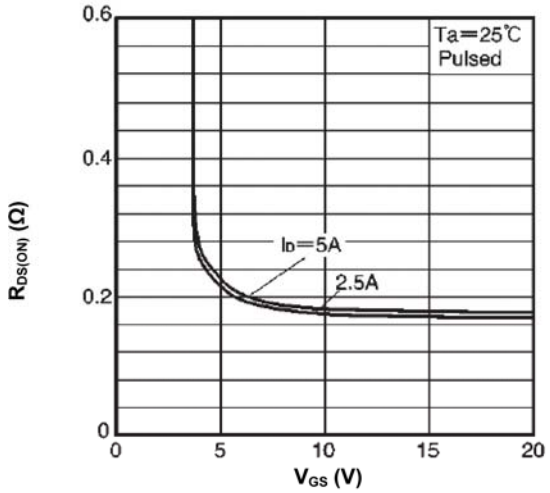



**Fig 7. On-Resistance vs. Gate-Source Voltage**

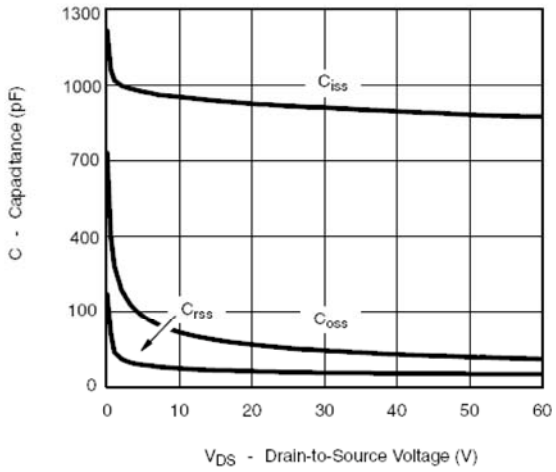



**Fig 8. Typical Capacitance Characteristics**

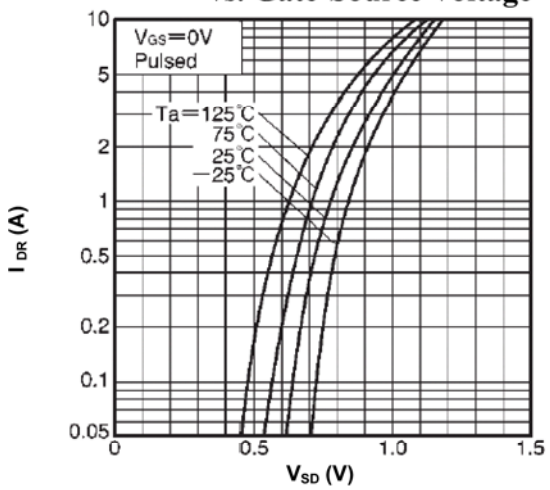



**Fig 9. Reverse Drain Current vs. Source-Drain Voltage ( Ⅰ )**

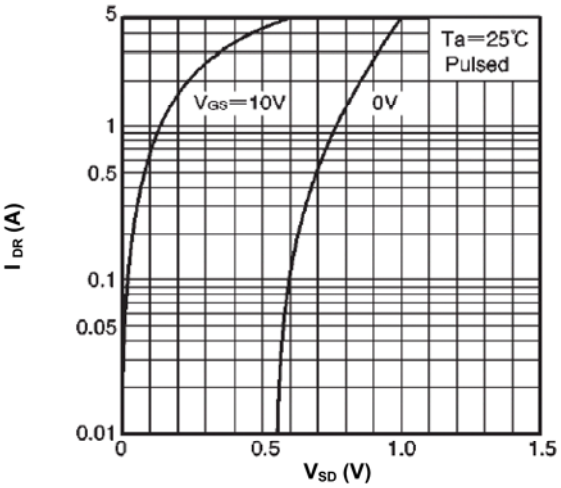



**Fig 10. Reverse Drain Current vs. Source-Drain Voltage ( Ⅱ )**

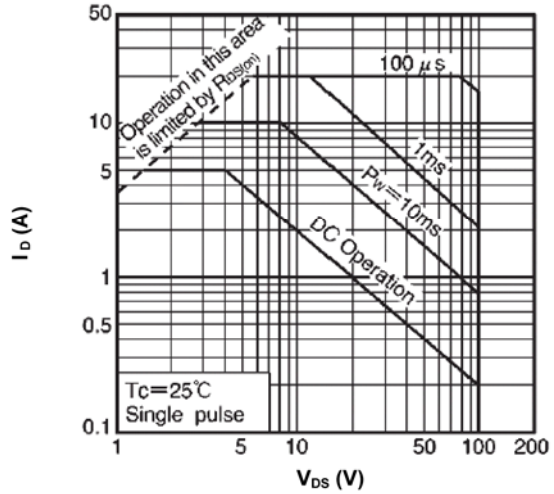



**Fig 11. Maximum Safe Operating Area**

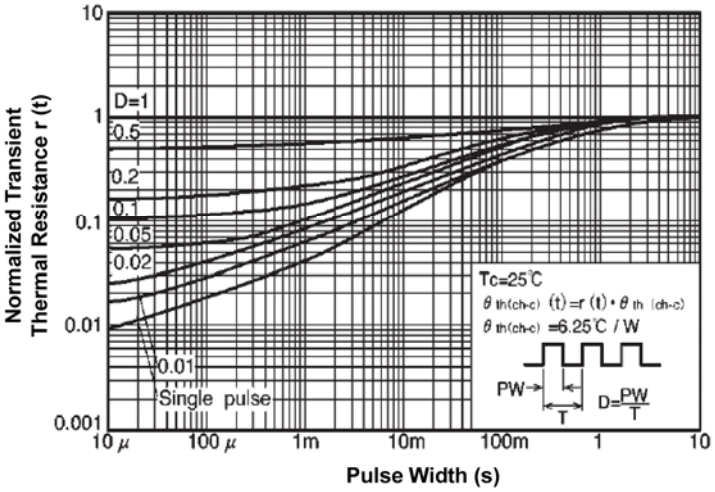



**Fig 12. Normalized Transient Thermal Resistance vs. Pulse Width**