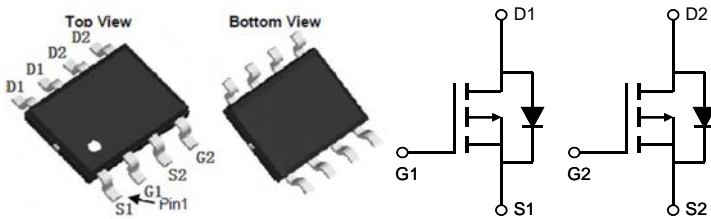


General Description

The KSP4953 series are from Advanced Power innovated design and silicon process technology to achieve the lowest possible onresistance and fast switching performance. It provides the designer with an extreme efficient device for use in a wide range of power applications.

SOP-8 Pin Configuration



Product Summary

| V_{DS} (V) | $R_{DS(on)}$ (m Ω) | I_D (A) |
|--------------|----------------------------|-----------|
| -30 | 52 at $V_{GS} = 10$ V | -4.5 |
| | 74 at $V_{GS} = 4.5$ V | -3.8 |

Features

- High power and current handling capability
- Lead free product is acquired
- Surface Mount Package

Applications

- PWM applications
- Load switch
- Power management

Absolute Maximum Ratings $T_c=25^\circ\text{C}$ unless otherwise noted

| Symbol | Parameter | Rating | Units |
|-----------|--|------------|---------------------|
| V_{DS} | Drain-Source Voltage | -30 | V |
| V_{GS} | Gate-Source Voltage | ± 20 | V |
| I_D | Drain Current – Continuous ($T_c=25^\circ\text{C}$) | -4.5 | A |
| | Drain Current – Continuous ($T_c=100^\circ\text{C}$) | -3.1 | A |
| I_{DM} | Drain Current – Pulsed ¹ | -17 | A |
| P_D | Power Dissipation ($T_c=25^\circ\text{C}$) | 1.5 | W |
| | Power Dissipation ($T_c=100^\circ\text{C}$) | 0.05 | W/ $^\circ\text{C}$ |
| T_{STG} | Storage Temperature Range | -55 to 150 | $^\circ\text{C}$ |
| T_J | Operating Junction Temperature Range | -55 to 150 | $^\circ\text{C}$ |

Thermal Characteristics

| Symbol | Parameter | Typ. | Max. | Unit |
|-----------------|--|------|------|---------------------------|
| $R_{\theta JA}$ | Thermal Resistance Junction to ambient | --- | 51 | $^\circ\text{C}/\text{W}$ |
| $R_{\theta JC}$ | Thermal Resistance Junction to Case | --- | 2.7 | $^\circ\text{C}/\text{W}$ |

Electrical Characteristics ($T_J=25^\circ\text{C}$, unless otherwise noted) Off Characteristics

| Symbol | Parameter | Conditions | Min. | Typ. | Max. | Unit |
|------------|--------------------------------|---|------|------|-----------|---------|
| BV_{DSS} | Drain-Source Breakdown Voltage | $V_{GS}=0V, I_D=-250\mu A$ | -30 | --- | --- | V |
| I_{DSS} | Drain-Source Leakage Current | $V_{DS}=-30V, V_{GS}=0V, T_J=25^\circ\text{C}$ | --- | --- | -1 | μA |
| | | $V_{DS}=-30V, V_{GS}=0V, T_J=125^\circ\text{C}$ | --- | --- | -15 | μA |
| I_{GSS} | Gate-Source Leakage Current | $V_{GS}=\pm 12V, V_{DS}=0V$ | --- | --- | ± 100 | nA |

On Characteristics

| | | | | | | |
|--------------|-----------------------------------|--------------------------------|------|------|------|-----------|
| $R_{DS(ON)}$ | Static Drain-Source On-Resistance | $V_{GS}=-10V, I_D=-4A$ | --- | 52 | 66 | $m\Omega$ |
| | | $V_{GS}=-4.5V, I_D=-3A$ | --- | 74 | 85 | $m\Omega$ |
| $V_{GS(th)}$ | Gate Threshold Voltage | $V_{GS}=V_{DS}, I_D=-250\mu A$ | -0.8 | -1.3 | -2.4 | V |
| g_{fs} | Forward Transconductance | $V_{DS}=-5V, I_S=-4A$ | --- | 20 | --- | S |

Dynamic and switching Characteristics

| | | | | | | |
|--------------|------------------------------|--|-----|-----|-----|----|
| Q_g | Total Gate Charge | $V_{DS}=-15V, V_{GS}=-10V, I_D=-4A$ | --- | 12 | --- | nC |
| Q_{gs} | Gate-Source Charge | | --- | 3.3 | --- | |
| Q_{gd} | Gate-Drain Charge | | --- | 4.2 | --- | |
| $T_{d(on)}$ | Turn-On Delay Time | $V_{DS}=-15V, I_D=-1A$ $V_{GS}=-10V, R_G=6\Omega$ | --- | 9 | --- | ns |
| T_r | Rise Time | | --- | 16 | --- | |
| $T_{d(off)}$ | Turn-Off Delay Time | | --- | 19 | --- | |
| T_f | Fall Time | | --- | 10 | --- | |
| C_{iss} | Input Capacitance | $V_{DS}=-15V, V_{GS}=0V, F=1\text{MHz}$ | --- | 620 | --- | pF |
| C_{oss} | Output Capacitance | | --- | 145 | --- | |
| C_{rss} | Reverse Transfer Capacitance | | --- | 75 | --- | |

Drain-Source Diode Characteristics and Maximum Ratings

| Symbol | Parameter | Conditions | Min. | Typ. | Max. | Unit |
|----------|---------------------------|--|------|------|------|------|
| I_S | Continuous Source Current | $V_G=V_D=0V, \text{Force Current}$ | --- | --- | -4.5 | A |
| I_{SM} | Pulsed Source Current | | --- | --- | -12 | A |
| V_{SD} | Diode Forward Voltage | $V_{GS}=0V, I_S=-1A, T_J=25^\circ\text{C}$ | --- | --- | -1.2 | V |

Note :

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, $t \leq 10$ sec.
3. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.
4. Guaranteed by design, not subject to production

Typical Electrical and Thermal Characteristics (Curves)

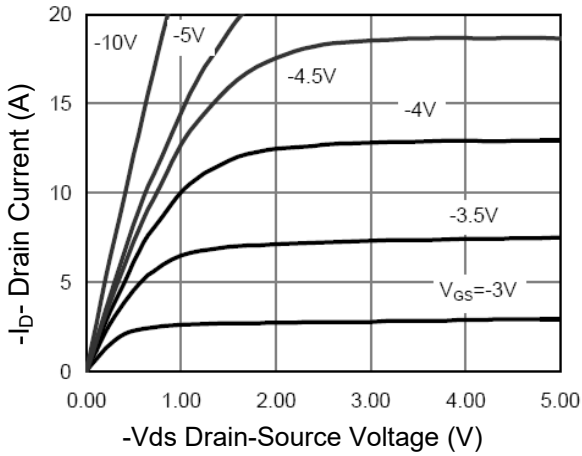


Fig. 1 Output Characteristics

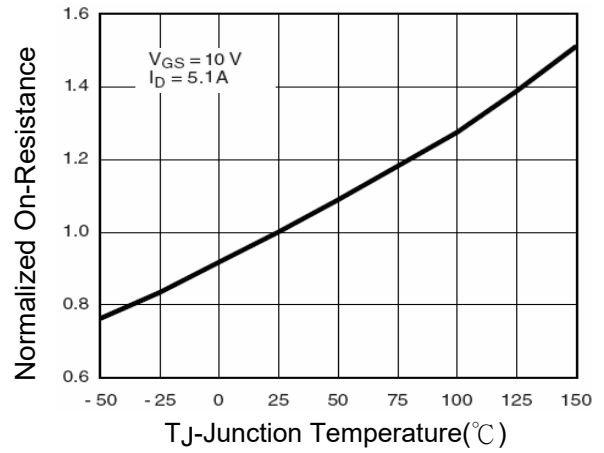


Fig. 4 Rds(on)-Junction Temperature

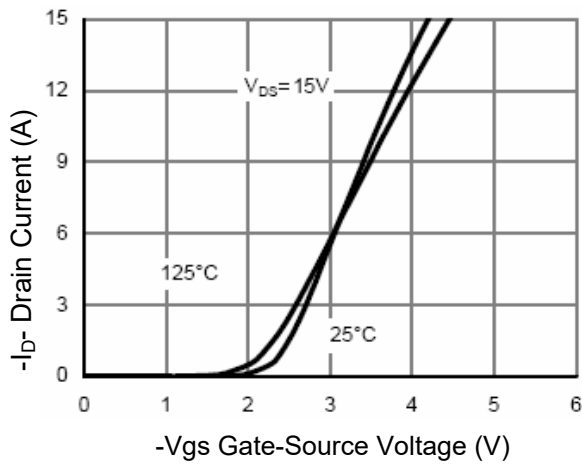


Fig. 2 Transfer Characteristics

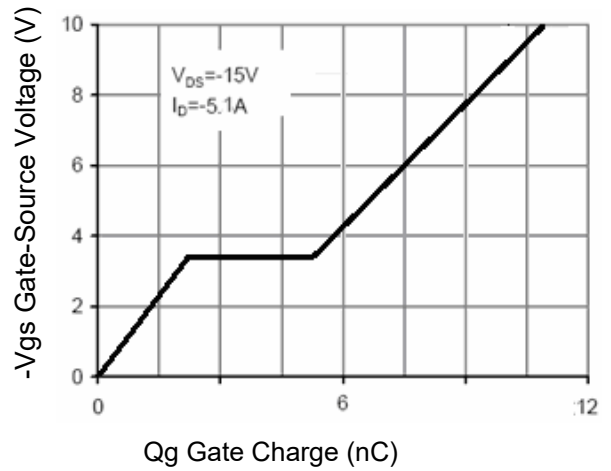


Fig. 5 Gate Charge

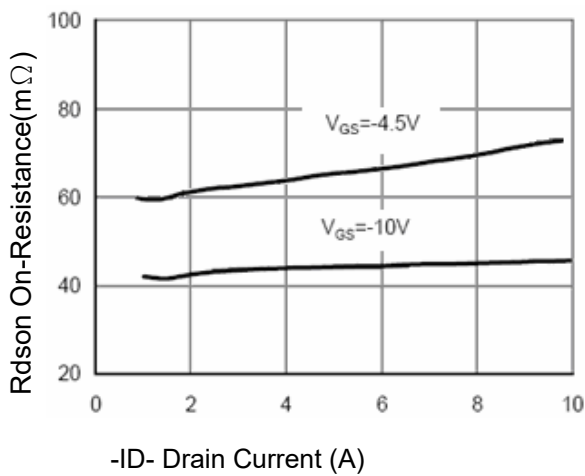


Fig. 3 Drain-Source On-Resistance

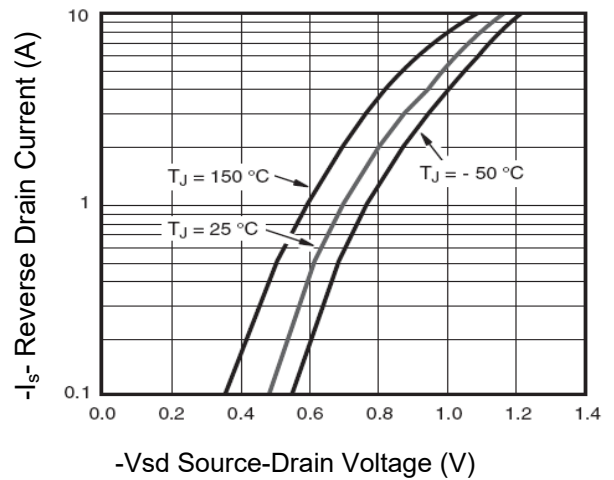


Fig. 6 Source-Drain Diode Forward

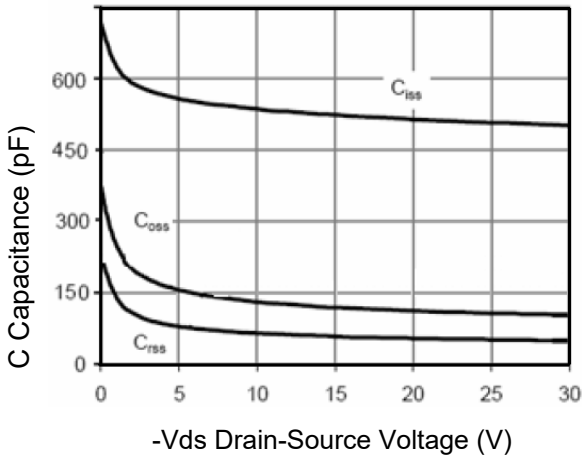


Fig.7 Capacitance vs Vds

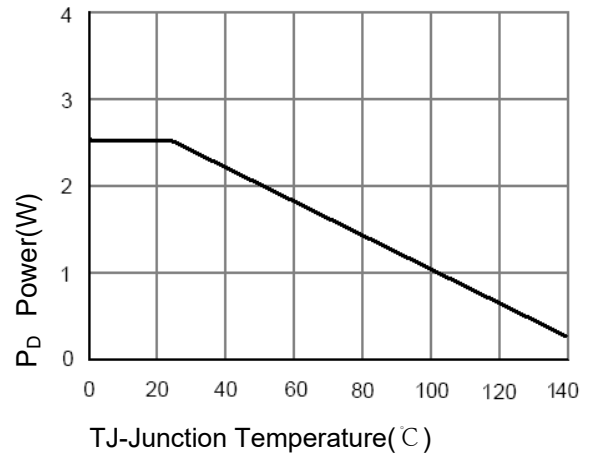


Fig.8 Power Dissipation

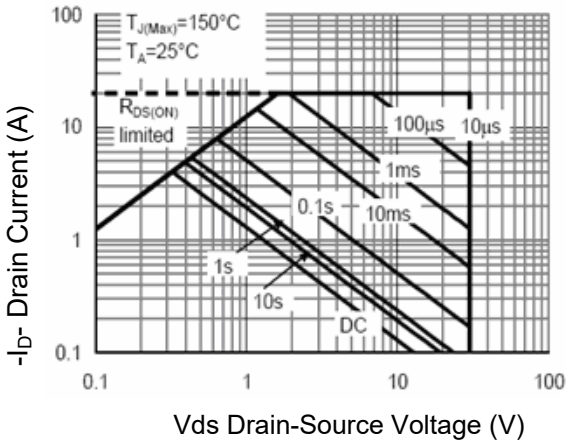


Fig.9 Safe Operation Area

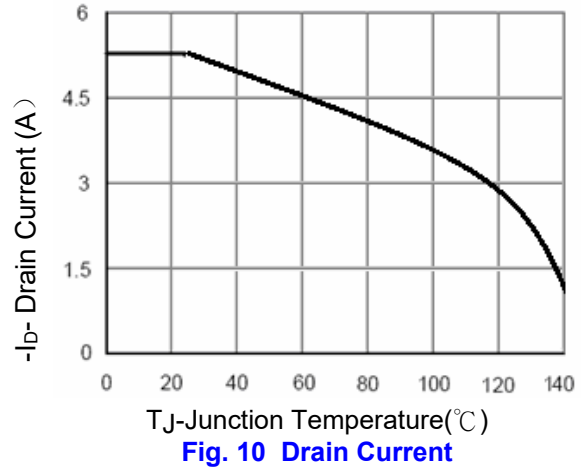


Fig. 10 Drain Current

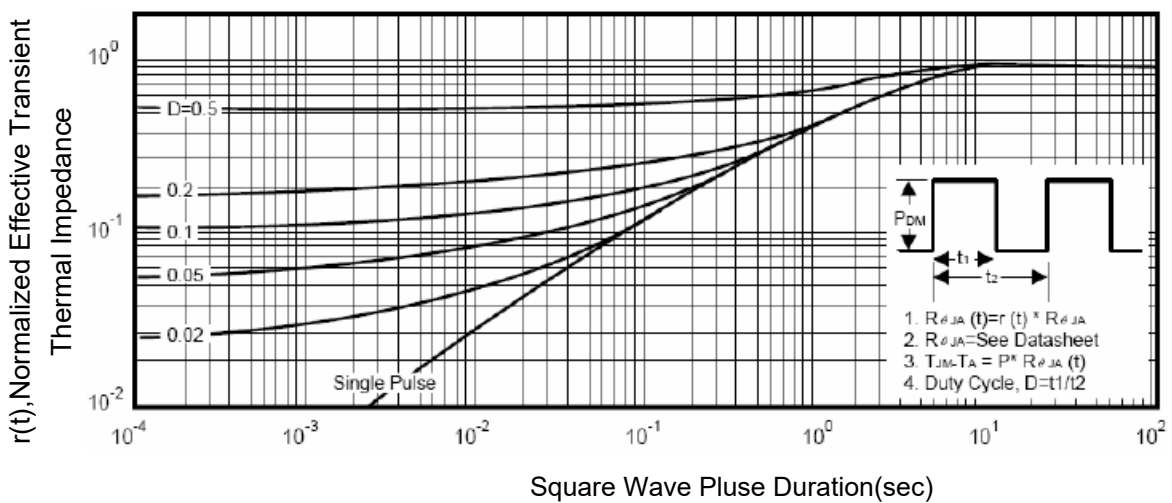


Fig.11 Normalized Maximum Transient Thermal Impedance

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