

SOP-8

Pin Definition:

- | | |
|-----------|----------|
| 1. Source | 8. Drain |
| 2. Source | 7. Drain |
| 3. Source | 6. Drain |
| 4. Gate | 5. Drain |

PRODUCT SUMMARY

| V_{DS} (V) | $R_{DS(on)}$ (m Ω) | I_D (A) |
|--------------|----------------------------|-----------|
| -30 | 14 @ $V_{GS} = -10V$ | -11 |
| | 20 @ $V_{GS} = -4.5V$ | -8.5 |

Features

- Advance Trench Process Technology
- High Density Cell Design for Ultra Low On-resistance

Application

- Load Switches
- Notebook PCs
- Desktop PCs

Ordering Information

| Part No. | Package | Packing |
|---------------|---------|--------------------|
| TSM4425CS RLG | SOP-8 | 2.5Kpcs / 13" Reel |

Note: "G" denotes for Halogen- and Antimony-free as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds

Absolute Maximum Rating ($T_C = 25^\circ C$ unless otherwise noted)

| Parameter | Symbol | Limit | Unit |
|---|----------------|--------------------|------------|
| Drain-Source Voltage | V_{DS} | -30 | V |
| Gate-Source Voltage | V_{GS} | ± 20 | V |
| Continuous Drain Current | I_D | -11 | A |
| Pulsed Drain Current | I_{DM} | -50 | A |
| Continuous Source Current (Diode Conduction) ^{a,b} | I_S | -2.1 | A |
| Maximum Power Dissipation | P_D | $T_a = 25^\circ C$ | 2.5 |
| | | $T_a = 75^\circ C$ | 1.6 |
| Operating Junction Temperature | T_J | +150 | $^\circ C$ |
| Operating Junction and Storage Temperature Range | T_J, T_{STG} | - 55 to +150 | $^\circ C$ |

Thermal Performance

| Parameter | Symbol | Limit | Unit |
|--|-----------------|-------|--------------|
| Junction to Foot Thermal Resistance | $R_{\theta JF}$ | 18 | $^\circ C/W$ |
| Junction to Ambient Thermal Resistance (PCB mounted) | $R_{\theta JA}$ | 52.5 | $^\circ C/W$ |

Notes:

- a. Pulse width limited by the Maximum junction temperature
 b. Surface Mounted on FR4 Board, $t \leq 10$ sec.

Block Diagram

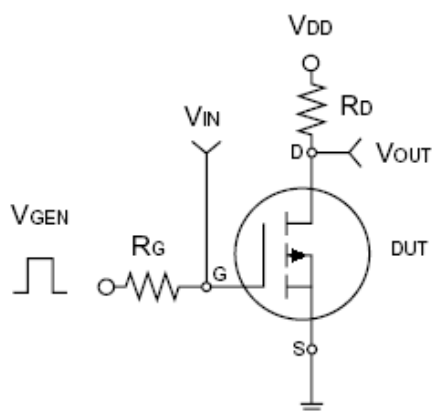

P-Channel MOSFET

Electrical Specifications (T_C = 25°C unless otherwise noted)

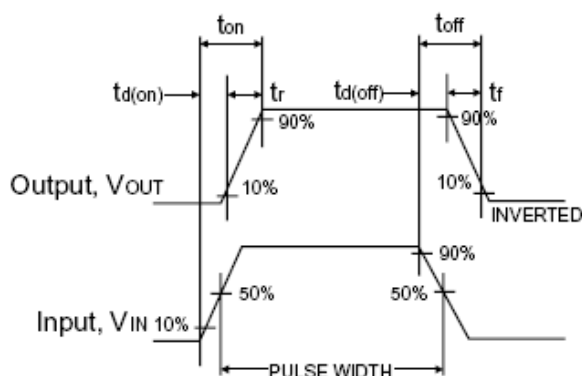
| Parameter | Conditions | Symbol | Min | Typ | Max | Unit |
|---|--|---------------------|-----|------|------|------|
| Static | | | | | | |
| Drain-Source Breakdown Voltage | V _{GS} = 0V, I _D = -250μA | BV _{DSS} | -30 | -- | -- | V |
| Gate Threshold Voltage | V _{DS} = V _{GS} , I _D = -250μA | V _{GS(TH)} | -1 | -- | -3 | V |
| Gate Body Leakage | V _{GS} = ±20V, V _{DS} = 0V | I _{GSS} | -- | -- | ±100 | nA |
| Zero Gate Voltage Drain Current | V _{DS} = -30V, V _{GS} = 0V | I _{DSS} | -- | -- | -1.0 | μA |
| On-State Drain Current ^a | V _{DS} = -5V, V _{GS} = -10V | I _{D(ON)} | -50 | -- | -- | A |
| Drain-Source On-State Resistance ^a | V _{GS} = -10V, I _D = -11A | R _{DS(ON)} | -- | 10 | 12 | mΩ |
| | V _{GS} = -4.5V, I _D = -8.5A | | -- | 15 | 19 | |
| Forward Transconductance ^a | V _{DS} = -15V, I _D = -11A | g _{fs} | -- | 23 | -- | S |
| Diode Forward Voltage | I _S = -2.1A, V _{GS} = 0V | V _{SD} | -- | -- | -1.3 | V |
| Dynamic^b | | | | | | |
| Total Gate Charge | V _{DS} = -15V, I _D = -11A, V _{GS} = -10V | Q _g | -- | 64 | -- | nC |
| Gate-Source Charge | | Q _{gs} | -- | 11 | -- | |
| Gate-Drain Charge | | Q _{gd} | -- | 25 | -- | |
| Input Capacitance | V _{DS} = -8V, V _{GS} = 0V, f = 1.0MHz | C _{iss} | -- | 3680 | -- | pF |
| Output Capacitance | | C _{oss} | -- | 930 | -- | |
| Reverse Transfer Capacitance | | C _{rss} | -- | 620 | -- | |
| Switching^c | | | | | | |
| Turn-On Delay Time | V _{DD} = 15V, R _L = 15Ω, I _D = 1A, V _{GEN} = -10V, R _G = 6Ω | t _{d(on)} | -- | 15 | -- | ns |
| Turn-On Rise Time | | t _r | -- | 13 | -- | |
| Turn-Off Delay Time | | t _{d(off)} | -- | 100 | -- | |
| Turn-Off Fall Time | | t _f | -- | 53 | -- | |

Notes:

- a. pulse test: PW ≤ 300μs, duty cycle ≤ 2%
- b. For DESIGN AID ONLY, not subject to production testing.
- b. Switching time is essentially independent of operating temperature.



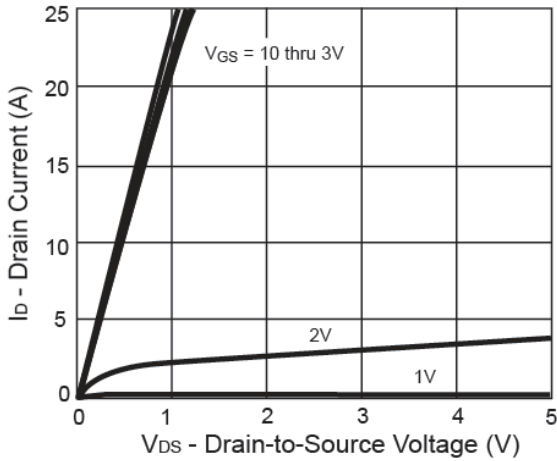
Switching Test Circuit



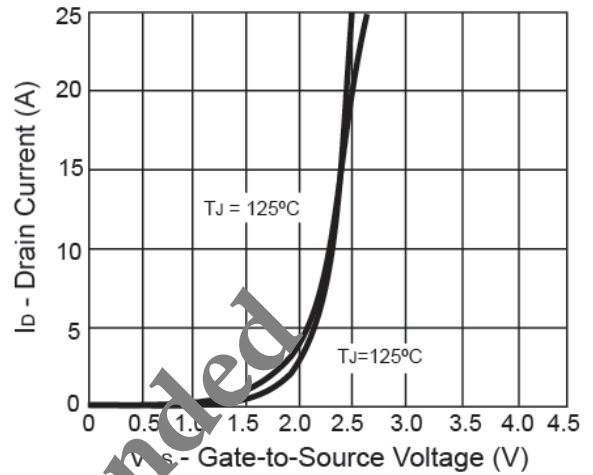
Switchin Waveforms

Electrical Characteristics Curve

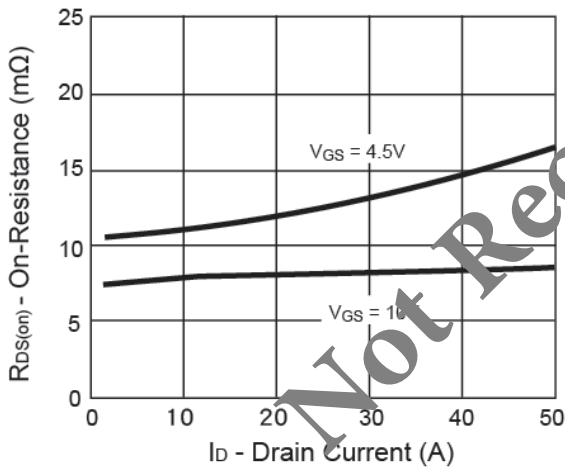
Output Characteristics



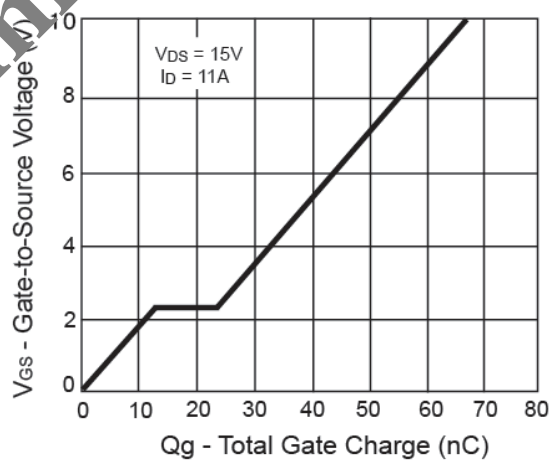
Transfer Characteristics



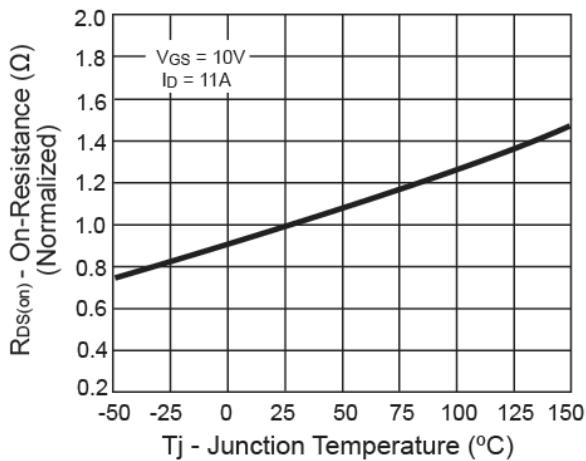
On-Resistance vs. Drain Current



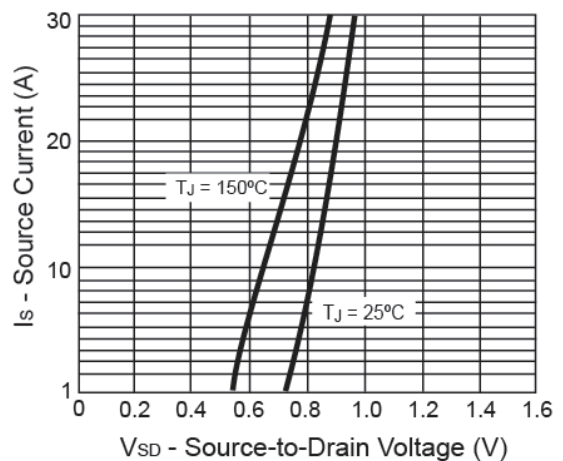
Gate Charge



On-Resistance vs. Junction Temperature

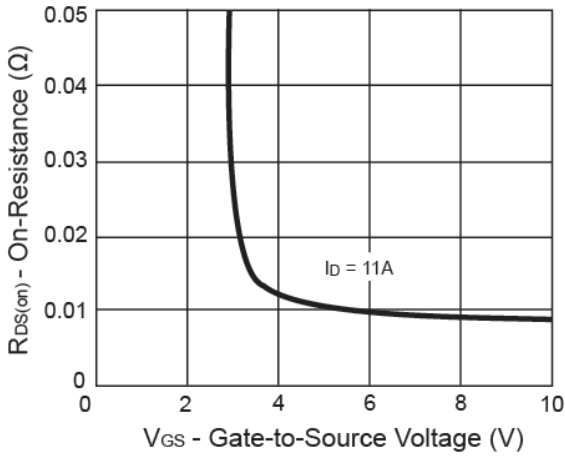


Source-Drain Diode Forward Voltage

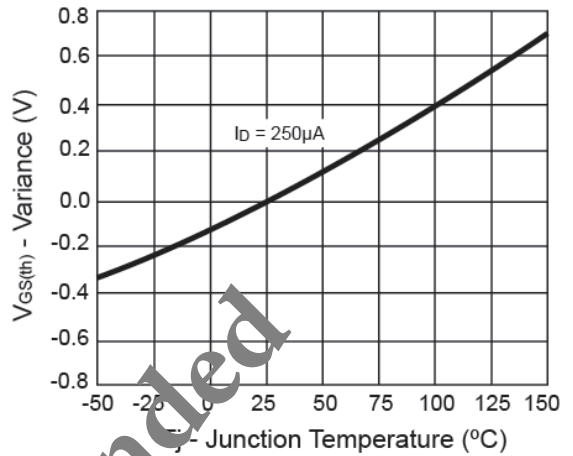


Electrical Characteristics Curve

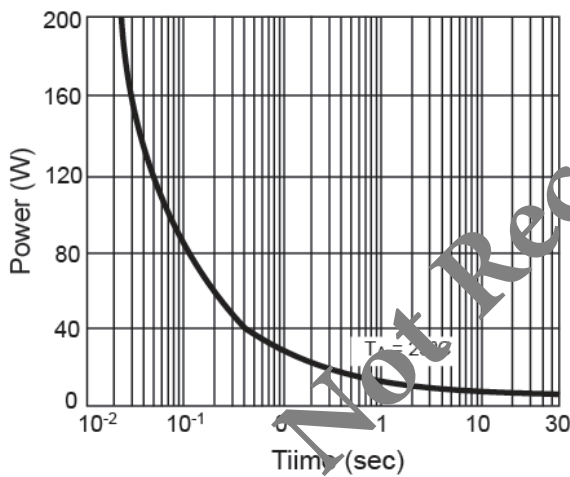
On-Resistance vs. Gate-Source Voltage



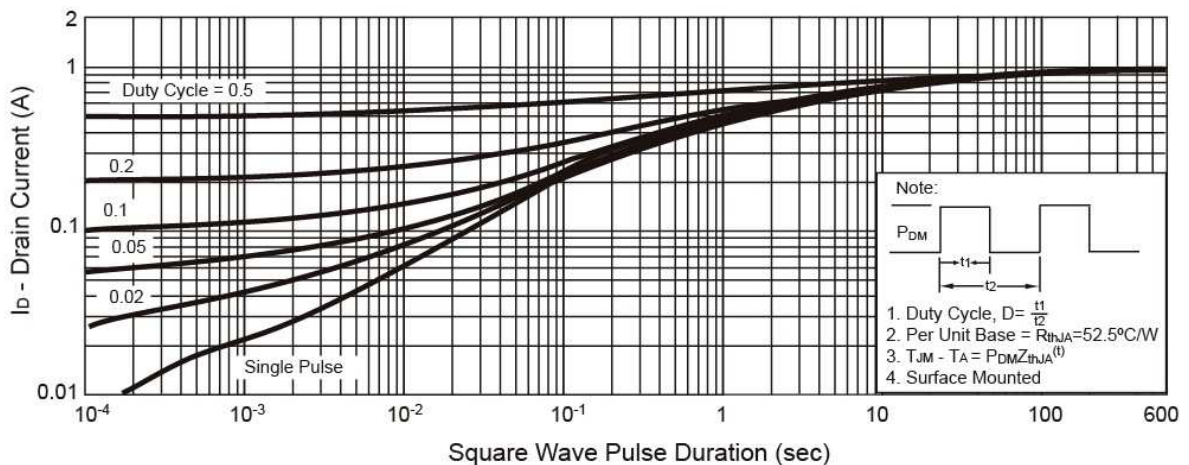
Threshold Voltage



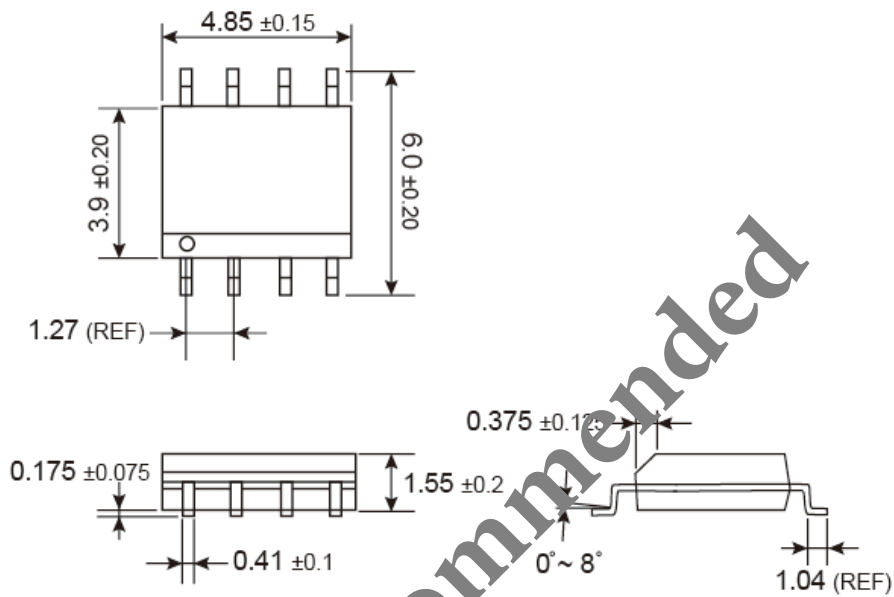
Single Pulse Power



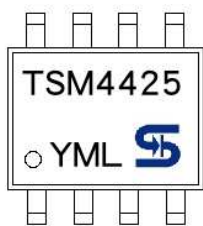
Normalized Thermal Transient Impedance, Junction-to-Ambient



SOP-8 Mechanical Drawing



Marking Diagram



Not Recommended

- Y = Year Code
- M = Month Code for Halogen Free Product
 - O =Jan P =Feb Q =Mar R =Apr
 - S =May T =Jun U =Jul V =Aug
 - W =Sep X =Oct Y =Nov Z =Dec
- L = Lot Code



TSM4425

30V P-Channel MOSFET

Not Recommended

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