

SOT-23

Pin Definition:

1. Gate
2. Source
3. Drain

PRODUCT SUMMARY

| V_{DS} (V) | $R_{DS(on)}$ (m Ω) | I_D (A) |
|--------------|----------------------------|-----------|
| 30 | 30 @ $V_{GS} = 10V$ | 5.8 |
| | 43 @ $V_{GS} = 4.5V$ | 5.0 |

Features

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

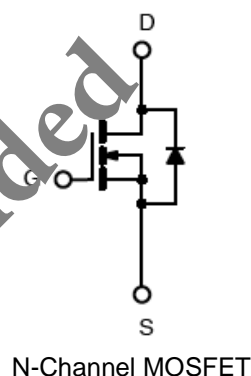
Application

- Load Switch
- PA Switch

Ordering Information

| Part No. | Package | Packing |
|---------------|---------|-----------------|
| TSM3404CX RFG | SOT-23 | 3Kpcs / 7" Reel |

Note: "G" denotes Halogen Free Product.

Block Diagram

Absolute Maximum Rating ($T_a = 25^\circ C$ 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 | 5.8 | A |
| Pulsed Drain Current | I_{DM} | 20 | A |
| Continuous Source Current (Diode Conduction) ^{a,b} | I_S | 2.5 | A |
| Maximum Power Dissipation | P_D | $T_a = 25^\circ C$ | 0.75 |
| | | $T_a = 75^\circ C$ | 0.48 |
| 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 | $R_{\theta_{JF}}$ | 75 | $^\circ C/W$ |
| Junction to Ambient Thermal Resistance (PCB mounted) | $R_{\theta_{JA}}$ | 140 | $^\circ C/W$ |

Notes:

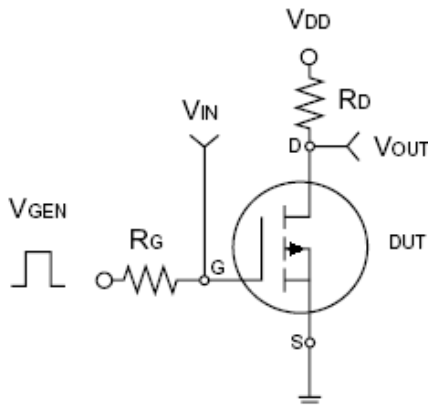
- a. Pulse width limited by the Maximum junction temperature
- b. Surface Mounted on FR4 Board, $t \leq 10$ sec.

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

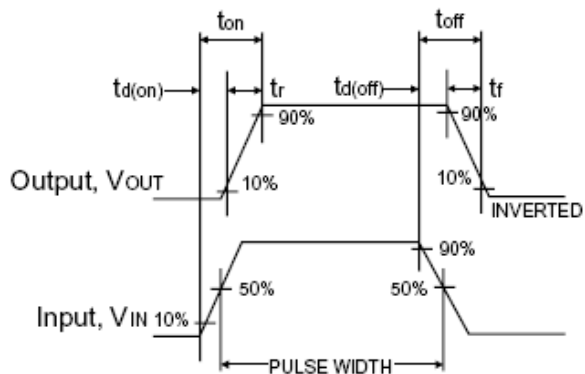
| Parameter | Conditions | Symbol | Min | Typ | Max | Unit |
|----------------------------------|---|---------------------|-----|--------|------|------|
| Static | | | | | | |
| Drain-Source Breakdown Voltage | V _{GS} = 0V, I _D = 250μA | BV _{DSS} | 30 | -- | -- | V |
| Gate Threshold Voltage | V _{DS} = V _{GS} , I _D = 250μA | V _{GS(TH)} | 1 | 1.4 | 3 | V |
| Gate Body Leakage | V _{GS} = ±20V, V _{DS} = 0V | I _{GSS} | -- | -- | ±100 | μA |
| Zero Gate Voltage Drain Current | V _{DS} = 24V, V _{GS} = 0V | I _{DSS} | -- | -- | 1.0 | μA |
| On-State Drain Current | V _{DS} = 5V, V _{GS} = 4.5V | I _{D(ON)} | 20 | -- | -- | A |
| Drain-Source On-State Resistance | V _{GS} = 10V, I _D = 5.8A | R _{DS(ON)} | -- | 23 | 30 | mΩ |
| | V _{GS} = 4.5V, I _D = 5A | | -- | 35 | 43 | |
| Forward Transconductance | V _{DS} = 5V, I _D = 5A | g _{fs} | -- | 25 | -- | S |
| Diode Forward Voltage | I _S = 1.0A, V _{GS} = 0V | V _{SD} | -- | 0.76 | 1 | V |
| Dynamic^b | | | | | | |
| Total Gate Charge | V _{DS} = 15V, I _D = 5.8A, V _{GS} = 10V | Q _g | -- | 4.52 | -- | nC |
| Gate-Source Charge | | Q _{gs} | -- | 1.24 | -- | |
| Gate-Drain Charge | | Q _{gd} | -- | 1.68 | -- | |
| Input Capacitance | V _{DS} = 15V, V _{GS} = 0V f = 1.0MHz | C _{iss} | -- | 400.96 | -- | pF |
| Output Capacitance | | C _{oss} | -- | 100.47 | -- | |
| Reverse Transfer Capacitance | | C _{rss} | -- | 71.82 | -- | |
| Switching^c | | | | | | |
| Turn-On Delay Time | V _{DS} = 5V, R _L = 2.2Ω, I _D = 1A, V _{GEN} = 10V, R _G = 6Ω | t _{d(on)} | -- | 7.42 | -- | ns |
| Turn-On Rise Time | | t _r | -- | 3.41 | -- | |
| Turn-Off Delay Time | | t _{d(off)} | -- | 20.4 | -- | |
| Turn-Off Fall Time | | t _f | -- | 3.01 | -- | |

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.



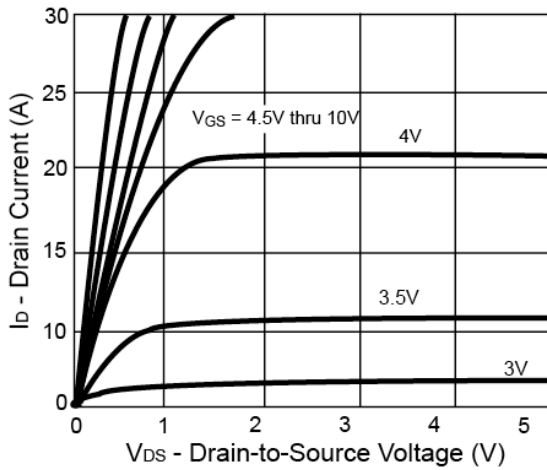
Switching Test Circuit



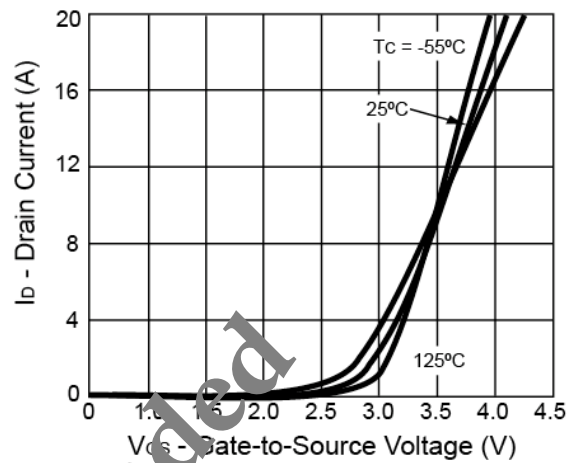
Switchin Waveforms

Electrical Characteristics Curve (Ta = 25°C, unless otherwise noted)

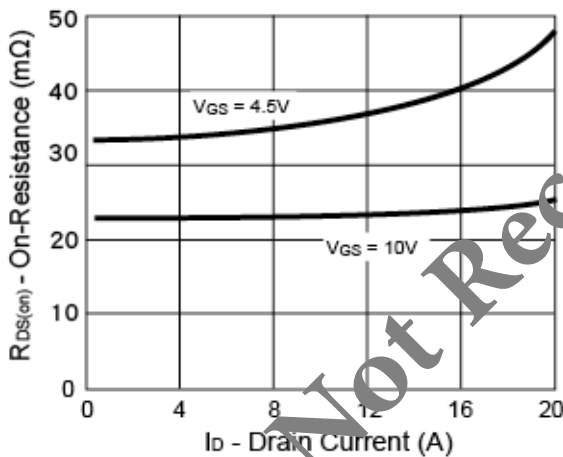
Output Characteristics



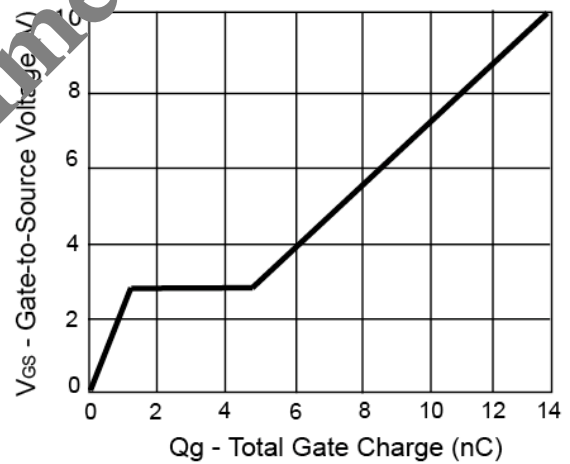
Transfer Characteristics



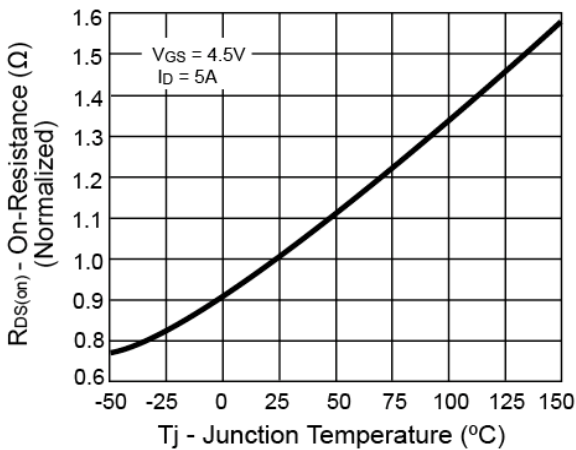
On-Resistance vs. Drain Current



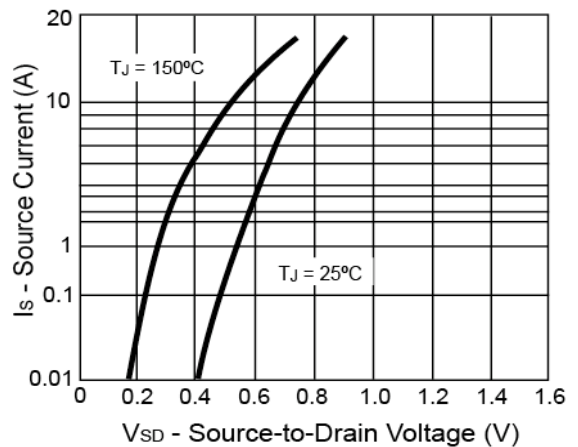
Gate Charge



On-Resistance vs. Junction Temperature

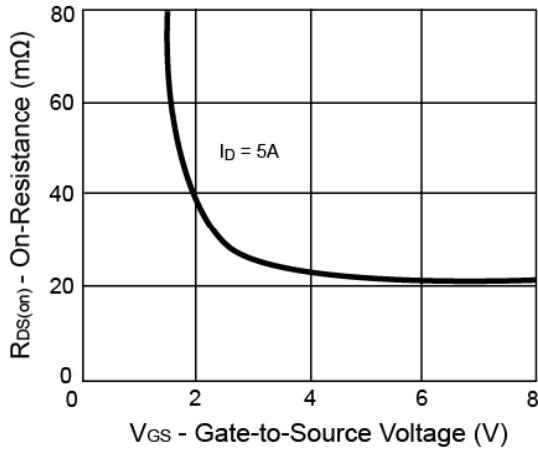


Source-Drain Diode Forward Voltage

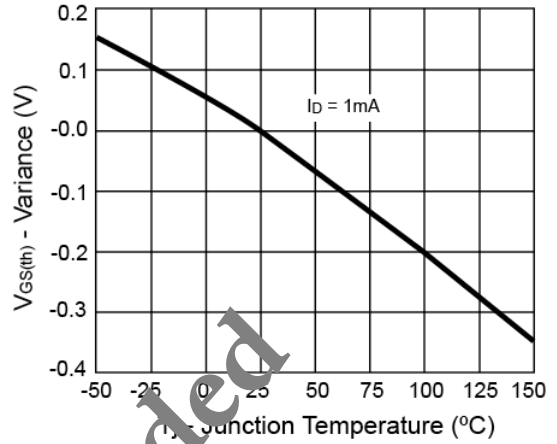


Electrical Characteristics Curve (Ta = 25°C, unless otherwise noted)

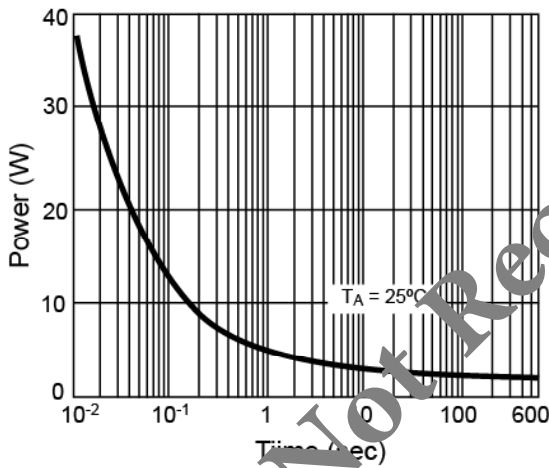
On-Resistance vs. Gate-Source Voltage



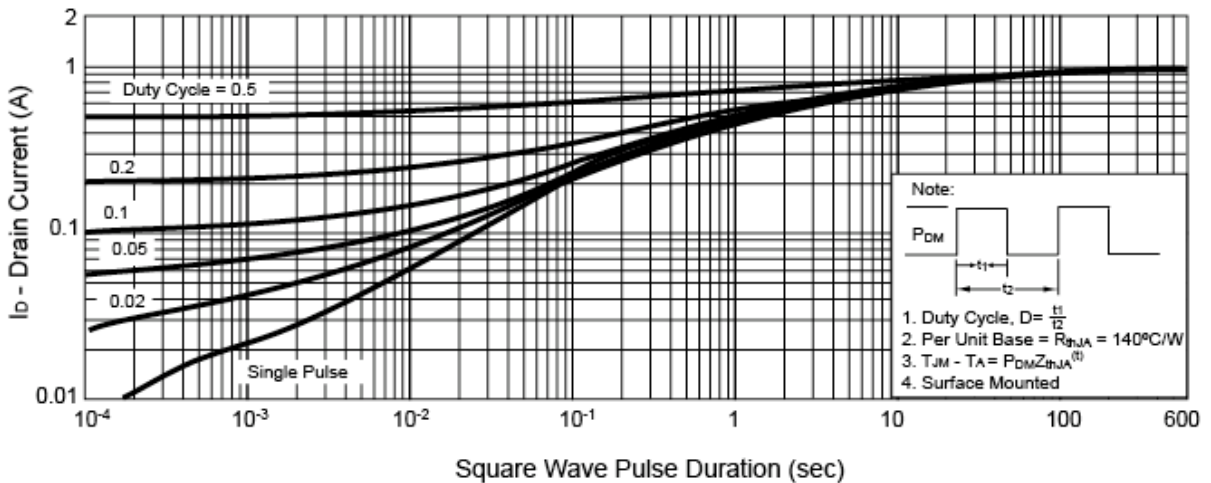
Threshold Voltage



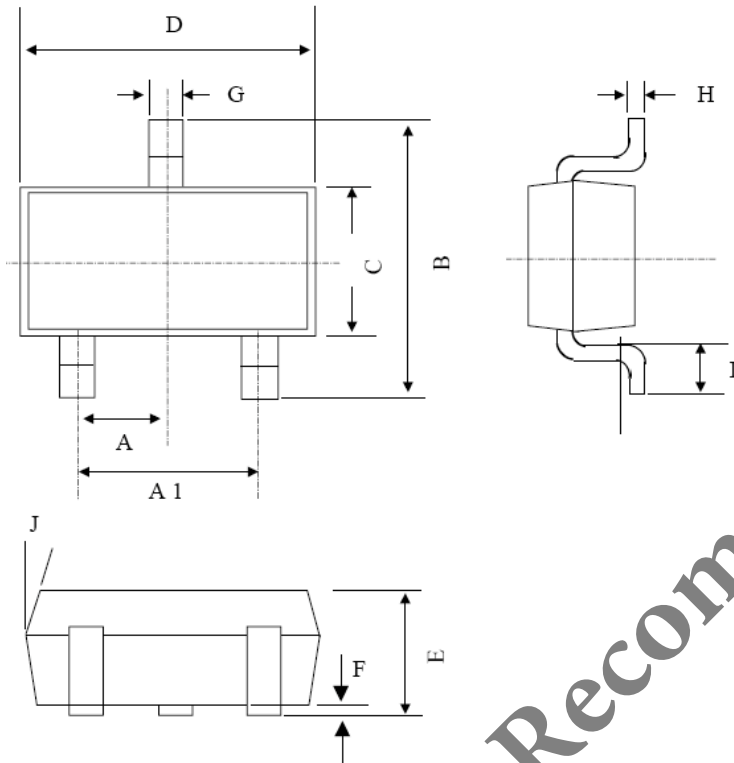
Single Pulse Power



Normalized Thermal Transient Impedance, Junction-to-Ambient

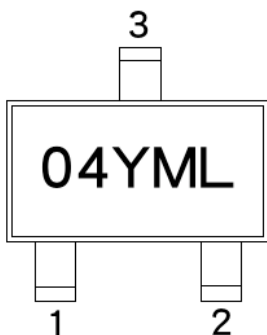


SOT-23 Mechanical Drawing



| DIM | MILLIMETERS | | INCHES | |
|-----|-------------|------|-----------|-------|
| | MIN | MAX | MIN | MAX. |
| A | 0.95 BSC | | 0.037 BSC | |
| A1 | 1.9 BSC | | 0.074 BSC | |
| B | 2.60 | 3.00 | 0.102 | 0.118 |
| C | 1.40 | 1.70 | 0.055 | 0.067 |
| D | 2.80 | 3.10 | 0.110 | 0.122 |
| E | 1.00 | 1.30 | 0.039 | 0.051 |
| F | 0.05 | 0.10 | 0.000 | 0.004 |
| G | 0.50 | 0.50 | 0.014 | 0.020 |
| H | 0.10 | 0.20 | 0.004 | 0.008 |
| I | 0.30 | 0.60 | 0.012 | 0.024 |
| J | 5° | 10° | 5° | 10° |

Marking Diagram



- 04** = Device Code
- 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

Not Recommended

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