



# TSM2832

## 20V N-Channel Enhancement Mode MOSFET

SOT-89



Pin assignment:

1. Gate
2. Drain
3. Source

**$V_{DS} = 20V$**

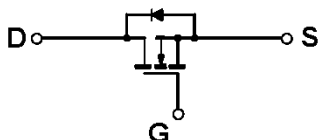
**$R_{DS(on)}, V_{GS} @ 4.5V, I_{DS} @ 3.6A = 60m\Omega$**

**$R_{DS(on)}, V_{GS} @ 2.5V, I_{DS} @ 3.1A = 90m\Omega$**

### Features

- ✧ Advanced trench process technology
- ✧ Excellent thermal and electrical capabilities
- ✧ High density cell design for ultra low on-resistance
- ✧ 2.5V operating voltage

### Block Diagram



### Ordering Information

| Part No.  | Packing                       | Package |
|-----------|-------------------------------|---------|
| TSM2832CY | Tape & Reel<br>1kpcs per reel | SOT-89  |

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

| Parameter                                        | Symbol         | Limit              | Unit       |
|--------------------------------------------------|----------------|--------------------|------------|
| Drain-Source Voltage                             | $V_{DS}$       | 20V                | V          |
| Gate-Source Voltage                              | $V_{GS}$       | $\pm 8$            | V          |
| Continuous Drain Current                         | $I_D$          | 3.6                | A          |
| Pulsed Drain Current                             | $I_{DM}$       | 10                 | A          |
| Maximum Power Dissipation                        | $P_D$          | $T_a = 25^\circ C$ | W          |
|                                                  |                | $T_a = 75^\circ C$ |            |
| 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         |
|------------------------------------------------------|-----------------|-------|--------------|
| Lead Temperature (1/8" from case)                    | $T_L$           | 5     | S            |
| Junction to Ambient Thermal Resistance (PCB mounted) | $R_{\theta ja}$ | 65    | $^\circ C/W$ |

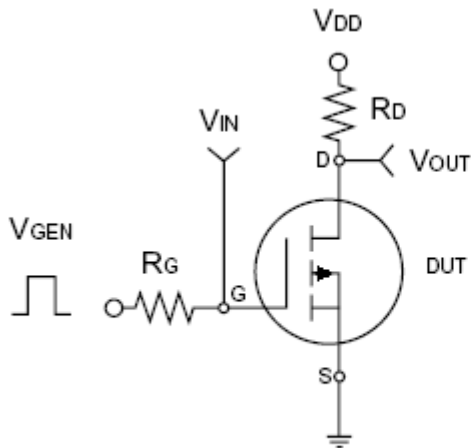
Note: Surface mounted on FR4 board  $t \leq 5sec$ .

## Electrical Characteristics

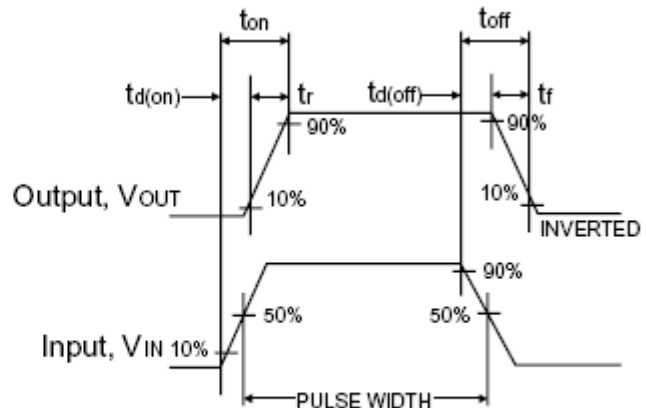
Rate  $I_D = 2.4A$ , ( $T_a = 25^\circ C$  unless otherwise noted)

| Parameter                        | Conditions                                                                        | Symbol       | Min  | Typ  | Max   | Unit |
|----------------------------------|-----------------------------------------------------------------------------------|--------------|------|------|-------|------|
| Static                           |                                                                                   |              |      |      |       |      |
| Drain-Source Breakdown Voltage   | $V_{GS} = 0V, I_D = 250\mu A$                                                     | $BV_{DSS}$   | 20   | --   | --    | V    |
| Drain-Source On-State Resistance | $V_{GS} = 4.5V, I_D = 3.6A$                                                       | $R_{DS(ON)}$ | --   | 50   | 60    | mΩ   |
| Drain-Source On-State Resistance | $V_{GS} = 2.5V, I_D = 3.1A$                                                       | $R_{DS(ON)}$ | --   | 75   | 90    |      |
| Gate Threshold Voltage           | $V_{DS} = V_{GS}, I_D = 250\mu A$                                                 | $V_{GS(TH)}$ | 0.45 | --   | --    | V    |
| Zero Gate Voltage Drain Current  | $V_{DS} = 20V, V_{GS} = 0V$                                                       | $I_{DSS}$    | --   | --   | 1.0   | uA   |
| Gate Body Leakage                | $V_{GS} = \pm 8V, V_{DS} = 0V$                                                    | $I_{GSS}$    | --   | --   | ± 100 | nA   |
| On-State Drain Current           | $V_{DS} \geq 5V, V_{GS} = 4.5V$                                                   | $I_{D(ON)}$  | 6    | --   | --    | A    |
| Forward Transconductance         | $V_{DS} = 5V, I_D = 3.6A$                                                         | $g_{fs}$     | --   | 10   | --    | S    |
| Dynamic                          |                                                                                   |              |      |      |       |      |
| Total Gate Charge                | $V_{DS} = 10V, I_D = 3.6A,$<br>$V_{GS} = 4.5V$                                    | $Q_g$        | --   | 5.2  | 10    | nC   |
| Gate-Source Charge               |                                                                                   | $Q_{gs}$     | --   | 0.65 | --    |      |
| Gate-Drain Charge                |                                                                                   | $Q_{gd}$     | --   | 1.5  | --    |      |
| Turn-On Delay Time               | $V_{DD} = 10V, R_L = 10\Omega,$<br>$I_D = 1A, V_{GEN} = 4.5V,$<br>$R_G = 6\Omega$ | $t_{d(on)}$  | --   | 7    | 15    | nS   |
| Turn-On Rise Time                |                                                                                   | $t_r$        | --   | 55   | 80    |      |
| Turn-Off Delay Time              |                                                                                   | $t_{d(off)}$ | --   | 16   | 60    |      |
| Turn-Off Fall Time               |                                                                                   | $t_f$        | --   | 10   | 25    |      |
| Input Capacitance                | $V_{DS} = 10V, V_{GS} = 0V,$<br>$f = 1.0MHz$                                      | $C_{iss}$    | --   | 450  | --    | pF   |
| Output Capacitance               |                                                                                   | $C_{oss}$    | --   | 70   | --    |      |
| Reverse Transfer Capacitance     |                                                                                   | $C_{rss}$    | --   | 43   | --    |      |
| Source-Drain Diode               |                                                                                   |              |      |      |       |      |
| Max. Diode Forward Current       |                                                                                   | $I_S$        | --   | --   | 1.6   | A    |
| Diode Forward Voltage            | $I_S = 1.0A, V_{GS} = 0V$                                                         | $V_{SD}$     | --   | 0.75 | 1.2   | V    |

Note : pulse test: pulse width  $\leq 300\mu s$ , duty cycle  $\leq 2\%$

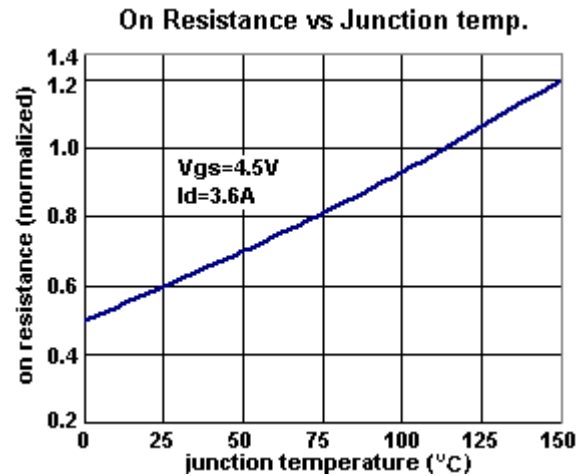
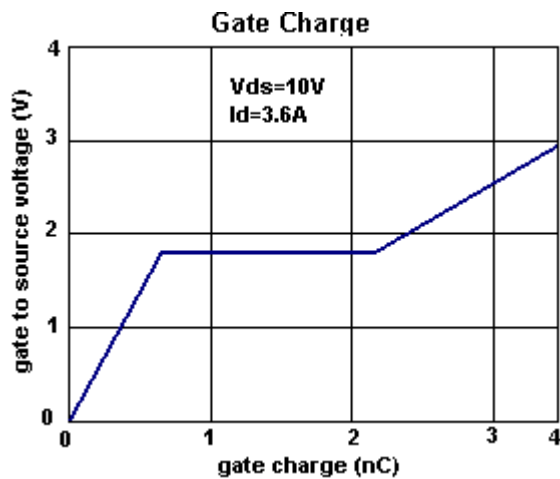
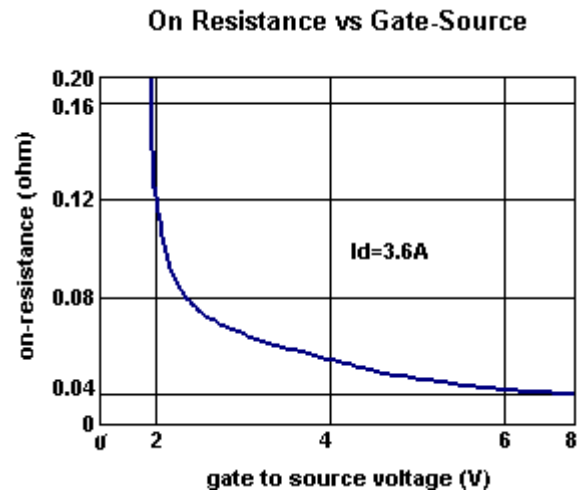
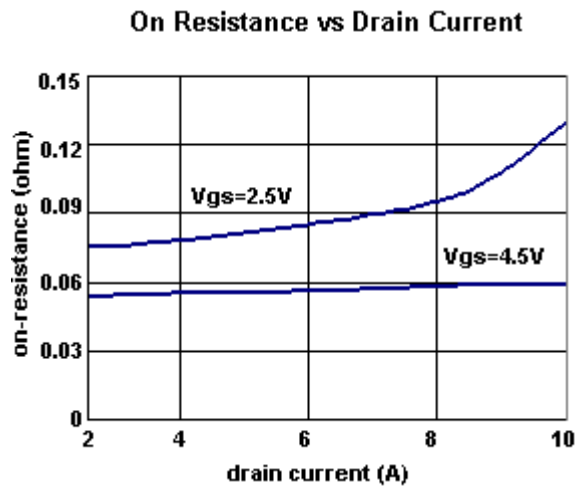
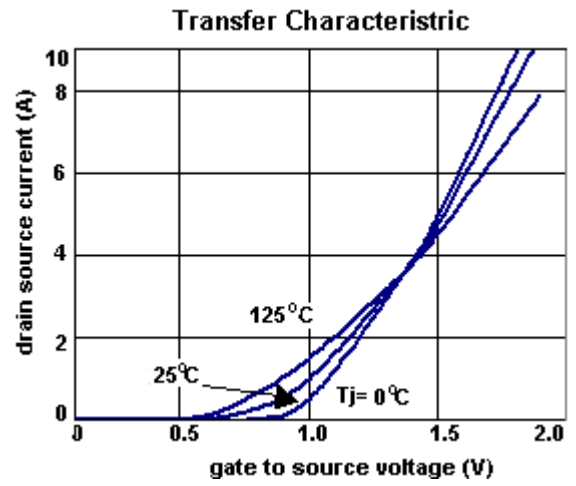
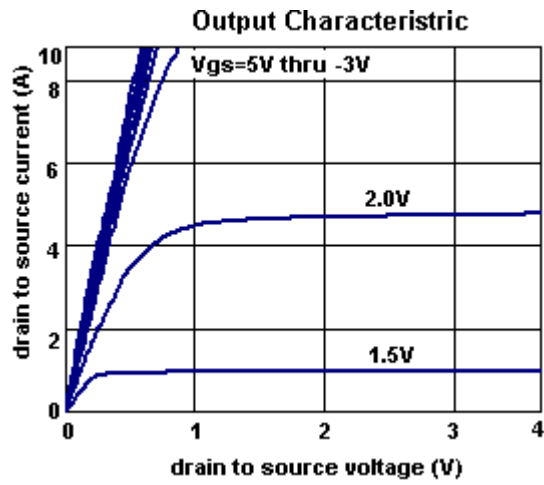


Switching Test Circuit

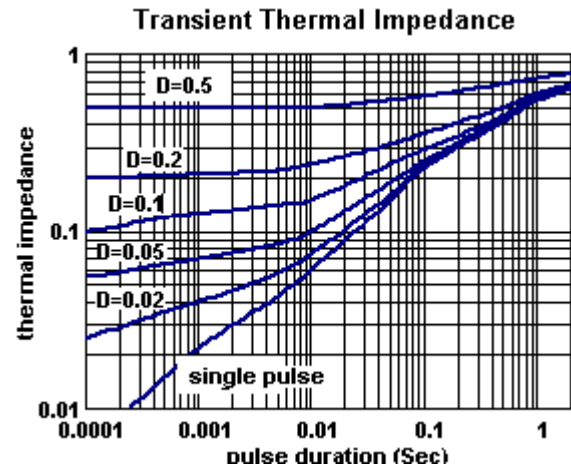
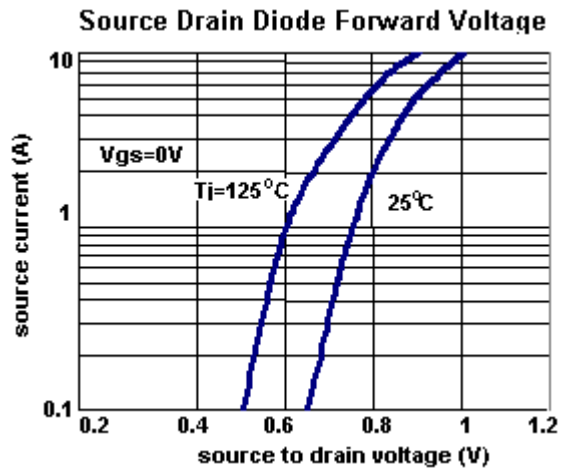


Switchin Waveforms

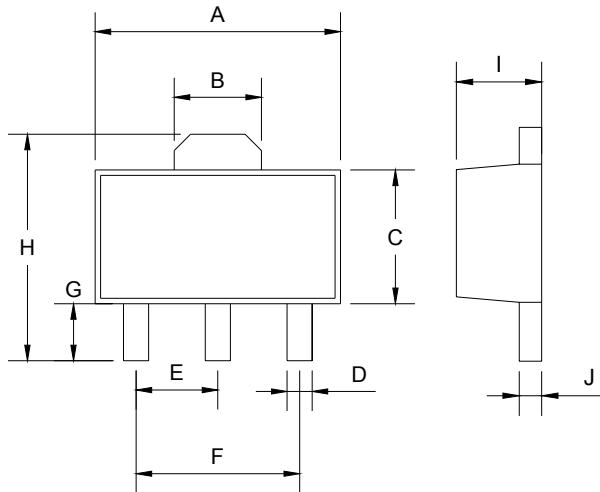
# **Typical Characteristics Curve** ( $T_a = 25^\circ\text{C}$ unless otherwise noted)



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## SOT-89 Mechanical Drawing



| SOT-89 DIMENSION |             |      |        |       |
|------------------|-------------|------|--------|-------|
| DIM              | MILLIMETERS |      | INCHES |       |
|                  | MIN         | MAX  | MIN    | MAX   |
| A                | 4.40        | 4.60 | 0.173  | 0.181 |
| B                | 1.50        | 1.7  | 0.059  | 0.070 |
| C                | 2.30        | 2.60 | 0.090  | 0.102 |
| D                | 0.40        | 0.52 | 0.016  | 0.020 |
| E                | 1.50        | 1.50 | 0.059  | 0.059 |
| F                | 3.00        | 3.00 | 0.118  | 0.118 |
| G                | 0.89        | 1.20 | 0.035  | 0.047 |
| H                | 4.05        | 4.25 | 0.159  | 0.167 |
| I                | 1.4         | 1.6  | 0.055  | 0.068 |
| J                | 0.35        | 0.44 | 0.014  | 0.017 |
|                  |             |      |        |       |