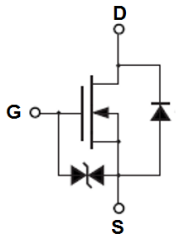
# LGE126E

**Silicon N-Channel Power MOSFET**

## Features

- ESD improved capability
- Depletion-mode ( normally-on)

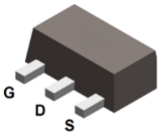



## Typical Applications

- Power switch circuit of adaptor and charger

## Mechanical Data

- Case: SOT-89
- Molding Compound: UL Flammability Classification Rating 94V-0
- Terminals: Matte tin-plated leads; solderability-per MIL-STD-202, Method 208




**SOT-89**

## Ordering Information

| Part Number | Package | Shipping Quantity | Marking Code |
|---|---|---|---|
| LGE126E | SOT-89 | 1000 pcs / Tape & Reel | 126 |

## Maximum Ratings (@ $T_C$ = 25°C unless otherwise specified)

| Parameter | Symbol | Value | Unit |
|---|---|---|---|
| Drain-to-Source Voltage | $V_{DSX}$ | 600 | V |
| Gate -Source Voltage | $V_{GSS}$ | ±20 | V |
| Continuous Drain Current ($T_C$ = 25°C) | $I_D$ | 0.04 | A |
| Continuous Drain Current ($T_C$ = 70°C) | | 0.032 | A |
| Pulsed Drain Current | $I_{DM}$ | 0.16 | A |
| Gate Source ESD(HBM-C = 100pF, R = 1.5kΩ) | $V_{ESD(G-S)}$ | 300 | V |

## Thermal Characteristics

| Parameter | Symbol | Value | Unit |
|---|---|---|---|
| Power Dissipation ($T_A$ = 25°C) | $P_D$ | 1 | W |
| Thermal Resistance Junction-to-Case | $R_{\theta JC}$ | 50 | °C/W |
| Thermal Resistance Junction-to-Air *1 | $R_{\theta JA}$ | 125 | °C/W |
| Operating Junction Temperature Range | $T_J$ | -55 ~ +150 | °C |
| Storage Temperature Range | $T_{STG}$ | -55 ~ +150 | °C |

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## Electrical Characteristics (@ $T_A$ = 25°C unless otherwise specified)

| Symbol | Parameter | Test Condition | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| **Off Characteristics** | | | | | | |
| $BV_{DSX}$ | Drain-to-Source Breakdown Voltage | $V_{GS}$ = -5V, $I_D$ = 250μA | 600 | - | - | V |
| $I_{D(OFF)}$ | Off-state Drain-to-Source Current | $V_{DS}$ = 600V, $V_{GS}$ = -5V | - | - | 0.1 | μA |
| $I_{GSS}$ | Gate-to-Source Leakage Current | $V_{GS}$ = ±20V, $V_{DS}$ = 0V | - | - | ±10 | μA |
| **On Characteristics** | | | | | | |
| $I_{DSS}$ | Saturated Drain-to-Source Current | $V_{GS}$ = 0V, $V_{DS}$ = 25V | 12 | - | - | mA |
| $R_{DS(ON)}$ | Drain-to-Source On-resistance *2 | $V_{GS}$ = 0V,$I_D$ = 3mA | - | - | 700 | Ω |
| | | $V_{GS}$ = 10V,$I_D$ = 16mA | - | - | 800 | Ω |
| $V_{GS(OFF)}$ | Gate-to-Source Cut-off Voltage | $V_{DS}$ = 3V, $I_D$ = 8μA | -2.7 | -2 | -1.0 | V |
| gfs | Forward Transconductance | $V_{DS}$ = 50V, $I_D$ = 10mA | - | 17 | - | mS |
| **Dynamic Characteristics** | | | | | | |
| $C_{ISS}$ | Input Capacitance | $V_{GS}$ = -5V<br>$V_{DS}$ = 25V<br>f = 1.0MHz | - | 50 | - | pF |
| $C_{OSS}$ | Output Capacitance | | - | 4.53 | - | |
| $C_{RSS}$ | Reverse Transfer Capacitance | | - | 1.08 | - | |
| **Switching Characteristics** | | | | | | |
| $t_{d(ON)}$ | Turn-on Delay Time *3 | $V_{DD}$ = 300V<br>$V_{GS}$ = -5V~7V<br>$R_G$ = 6Ω<br>$I_D$ = 10mA | - | 9.9 | - | ns |
| $t_r$ | Turn-on Rise Time *3 | | - | 55.8 | - | |
| $t_{d(OFF)}$ | Turn-Off Delay Time *3 | | - | 56.4 | - | |
| $t_f$ | Turn-Off Fall Time *3 | | - | 136 | - | |
| $Q_G$ | Total Gate-Charge | $V_{DD}$ = 400V<br>$V_{GS}$ = -5V~5V<br>$I_D$ = 10mA | - | 1.14 | - | nC |
| $Q_{GS}$ | Gate to Source Charge | | - | 0.5 | - | |
| $Q_{GD}$ | Gate to Drain (Miller) Charge | | - | 0.37 | - | |
| **Source-Drain Diode Characteristics** | | | | | | |
| $V_{SD}$ | Diode Forward Voltage *2 | $I_{SD}$ = 16mA, $V_{GS}$ = -5V | - | - | 1.2 | V |
| trr | Reverse Recovery Time | $I_{SD}$ = 10mA, $V_{GS}$ = 0V<br>$d_I/d_t$ = 100A/μs | - | 243 | - | ns |
| Qrr | Reverse Recovery Charge | | - | 636 | - | nC |
| **Gate-source Zener Diode** | | | | | | |
| $V_{GSO}$ | Gate-source Breakdown Voltage | $I_{GS}$ = ±1mA(Open Drain) | 20 | - | - | V |

Notes:

1. The data tested by surface mounted on a 1 inch$^2$ FR-4 board with 2OZ copper
2. The data tested by pulsed, pulse width ≤ 300μs, duty cycle ≤ 2%
3. Guaranteed by design, not subject to production

## Ratings and Characteristics Curves (@ $T_A$ = 25°C unless otherwise specified)

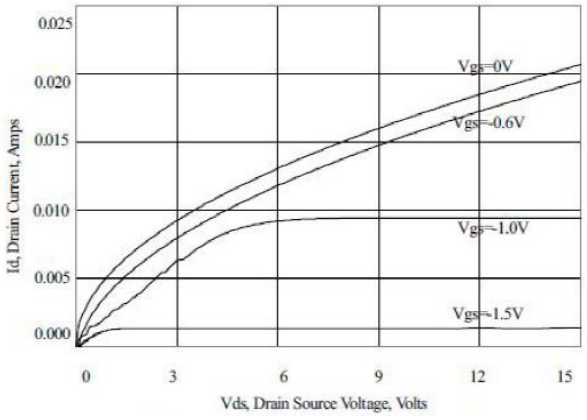


Fig 1 Typical Output Characteristics

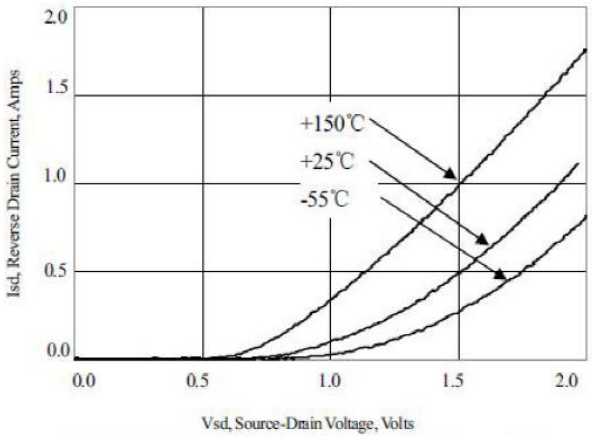


Fig 2 Body-Diode Characteristics

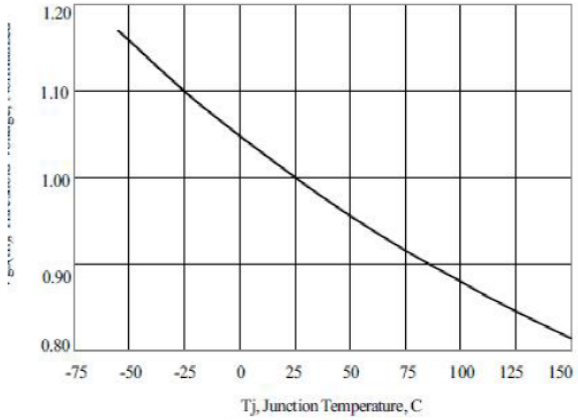


Fig 3 Normalized $V_{GS(th)}$ vs. Junction Temperature

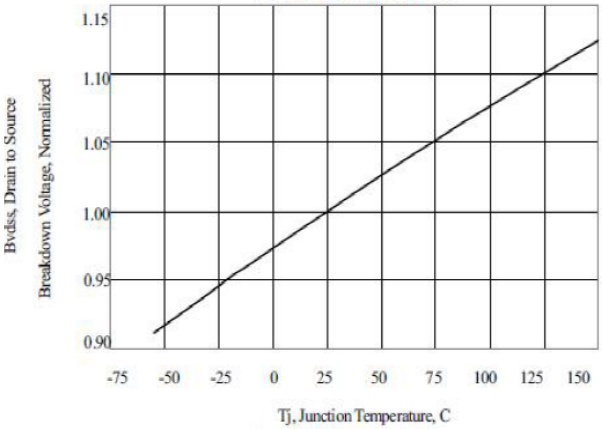


Fig 4 Normalized Breakdown Voltage vs. Junction Temperature

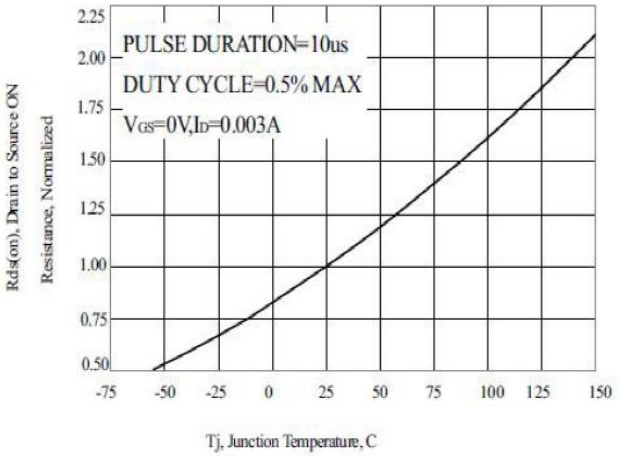


Fig 5 Normalized On-Resistance vs. Junction Temperature

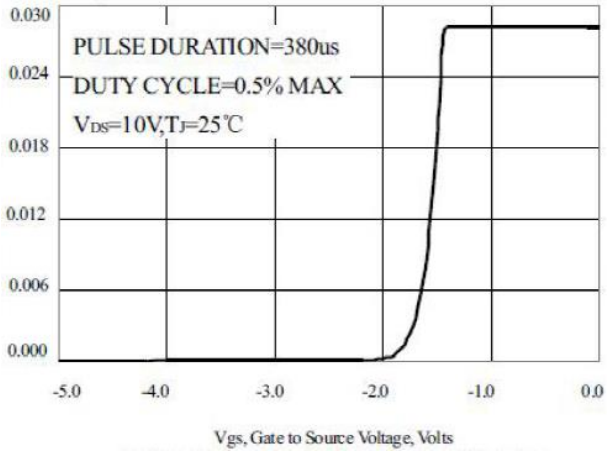


Fig 6 Transfer Characteristics

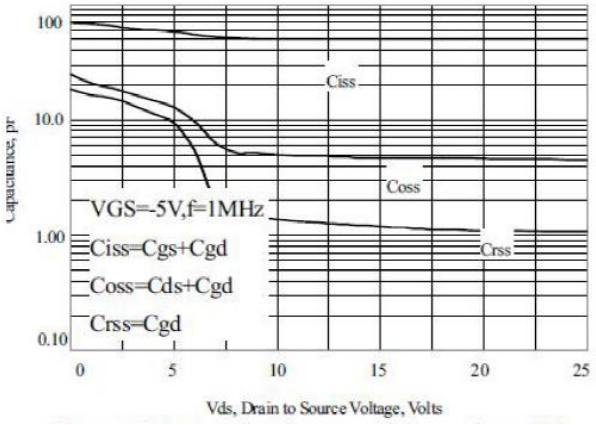


Fig 7 Capacitance Characteristics

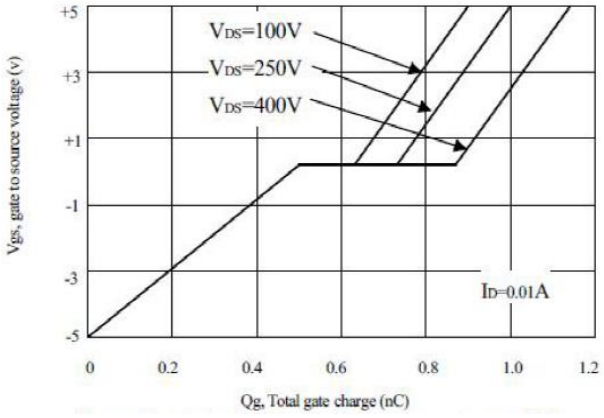


Fig 8 Gate-Charge Characteristics

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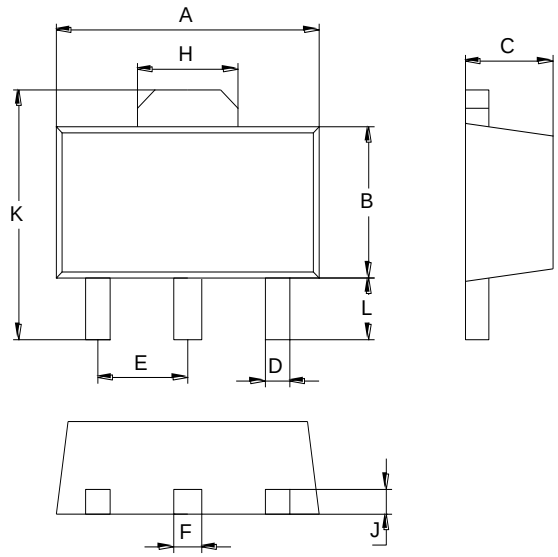
## Package Outline Dimensions (Unit: mm)




| SOT-89 | | |
|---|---|---|
| **Dimension** | **Min.** | **Max.** |
| A | 4.30 | 4.70 |
| B | 2.25 | 2.65 |
| C | 1.30 | 1.70 |
| D | 0.30 | 0.50 |
| E | 1.40 | 1.60 |
| F | 0.38 | 0.58 |
| H | 1.60 | 1.80 |
| J | 0.30 | 0.50 |
| L | 0.90 | 1.10 |
| K | 3.95 | 4.35 |

## Mounting Pad Layout (Unit: mm)

**SOT-89**