

**GSC8107E****P-CHANNEL ENHANCEMENT MODE POWER MOSFET**

|         |       |
|---------|-------|
| BVDSS   | -30V  |
| RDS(ON) | 7.0mΩ |
| ID      | -13A  |

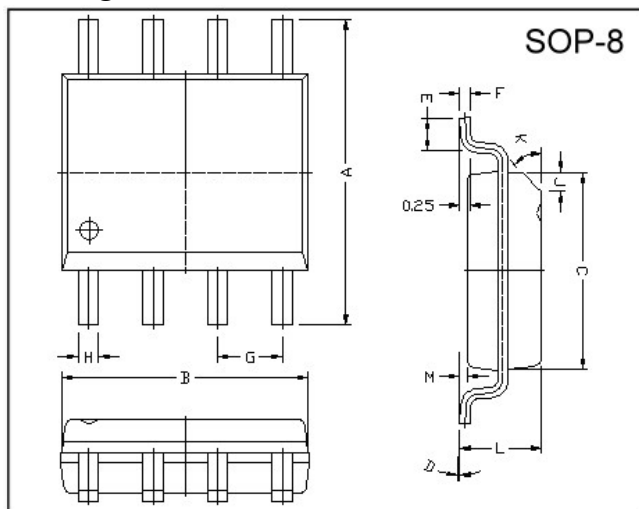
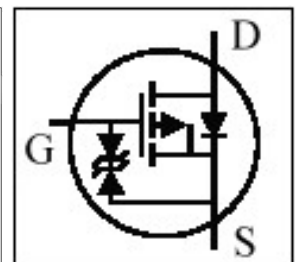
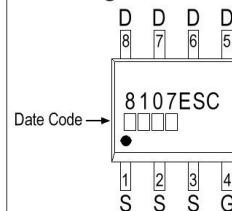
**Description**

The GSC8107E provide the designer with the best combination of fast switching, ruggedized device design, low on-resistance and cost-effectiveness.

The SOP-8 package is universally preferred for all commercial-industrial surface mount applications and suited for low voltage applications such as DC/DC converters.

**Features**

- \*Simple Drive Requirement
- \*Lower On-resistance
- \*Fast Switching Characteristic

**Package Dimensions****Marking :**

| REF. | Millimeter |      | REF. | Millimeter |      |
|------|------------|------|------|------------|------|
|      | Min.       | Max. |      | Min.       | Max. |
| A    | 5.80       | 6.20 | M    | 0.10       | 0.25 |
| B    | 4.80       | 5.00 | H    | 0.35       | 0.49 |
| C    | 3.80       | 4.00 | L    | 1.35       | 1.75 |
| D    | 0°         | 8°   | J    | 0.375 REF. |      |
| E    | 0.40       | 0.90 | K    | 45°        |      |
| F    | 0.19       | 0.25 | G    | 1.27 TYP.  |      |

**Absolute Maximum Ratings**

| Parameter                                        | Symbol                   | Ratings    | Unit |
|--------------------------------------------------|--------------------------|------------|------|
| Drain-Source Voltage                             | $V_{DS}$                 | -30        | V    |
| Gate-Source Voltage                              | $V_{GS}$                 | $\pm 20$   | V    |
| Continuous Drain Current <sup>3</sup>            | $I_D @ T_A = 25^\circ C$ | -13        | A    |
| Continuous Drain Current <sup>3</sup>            | $I_D @ T_A = 70^\circ C$ | -10        | A    |
| Pulsed Drain Current <sup>1</sup>                | $I_{DM}$                 | -52        | A    |
| Total Power Dissipation                          | $P_D @ T_A = 25^\circ C$ | 2.5        | W    |
| Linear Derating Factor                           |                          | 0.02       | W/°C |
| Operating Junction and Storage Temperature Range | $T_j, T_{stg}$           | -55 ~ +150 | °C   |

**Thermal Data**

| Parameter                                             | Symbol        | Value | Unit |
|-------------------------------------------------------|---------------|-------|------|
| Thermal Resistance Junction-ambient <sup>3</sup> Max. | $R_{thj-amb}$ | 50    | °C/W |

**Electrical Characteristics (T<sub>j</sub> = 25°C unless otherwise specified)**

| Parameter                                      | Symbol              | Min. | Typ. | Max. | Unit | Test Conditions                                                                                                         |
|------------------------------------------------|---------------------|------|------|------|------|-------------------------------------------------------------------------------------------------------------------------|
| Drain-Source Breakdown Voltage                 | BV <sub>DSS</sub>   | -30  | -    | -    | V    | V <sub>GS</sub> =0, I <sub>D</sub> =-10mA                                                                               |
| Gate Threshold Voltage                         | V <sub>GS(th)</sub> | -0.8 | -    | -2.0 | V    | V <sub>DS</sub> =10, I <sub>D</sub> =-1mA                                                                               |
| Forward Transconductance                       | g <sub>fs</sub>     | -    | 31   | -    | S    | V <sub>DS</sub> =-10V, I <sub>D</sub> =-6.5A                                                                            |
| Gate-Source Leakage Current                    | I <sub>GSS</sub>    | -    | -    | ±10  | uA   | V <sub>GS</sub> = ±16V                                                                                                  |
| Drain-Source Leakage Current                   | I <sub>DSS</sub>    | -    | -    | -10  | uA   | V <sub>DS</sub> =-30V, V <sub>GS</sub> =0                                                                               |
| Static Drain-Source On-Resistance <sup>2</sup> | R <sub>DS(ON)</sub> | -    | -    | 7    | mΩ   | V <sub>GS</sub> =-10V, I <sub>D</sub> =-6.5A                                                                            |
|                                                |                     | -    | -    | 15   |      | V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-6.5A                                                                           |
| Total Gate Charge <sup>2</sup>                 | Q <sub>g</sub>      | -    | 130  | -    | nC   | I <sub>D</sub> =-13A<br>V <sub>DS</sub> =-24V<br>V <sub>GS</sub> =-10V                                                  |
| Gate-Source Charge                             | Q <sub>gs</sub>     | -    | 10   | -    |      |                                                                                                                         |
| Gate-Drain ("Miller") Charge                   | Q <sub>gd</sub>     | -    | 30   | -    |      |                                                                                                                         |
| Turn-on Delay Time <sup>2</sup>                | T <sub>d(on)</sub>  | -    | 22   | -    | ns   | V <sub>DS</sub> =-15V<br>I <sub>D</sub> =-6.5A<br>V <sub>GS</sub> =-10V<br>R <sub>G</sub> =4.7Ω<br>R <sub>L</sub> =2.3Ω |
| Rise Time                                      | T <sub>r</sub>      | -    | 11   | -    |      |                                                                                                                         |
| Turn-off Delay Time                            | T <sub>d(off)</sub> | -    | 395  | -    |      |                                                                                                                         |
| Fall Time                                      | T <sub>f</sub>      | -    | 110  | -    |      |                                                                                                                         |
| Input Capacitance                              | C <sub>iss</sub>    | -    | 5880 | -    | pF   | V <sub>GS</sub> =0V<br>V <sub>DS</sub> =-10V<br>f=1.0MHz                                                                |
| Output Capacitance                             | C <sub>oss</sub>    | -    | 1000 | -    |      |                                                                                                                         |
| Reverse Transfer Capacitance                   | C <sub>rss</sub>    | -    | 1050 | -    |      |                                                                                                                         |

**Source-Drain Diode**

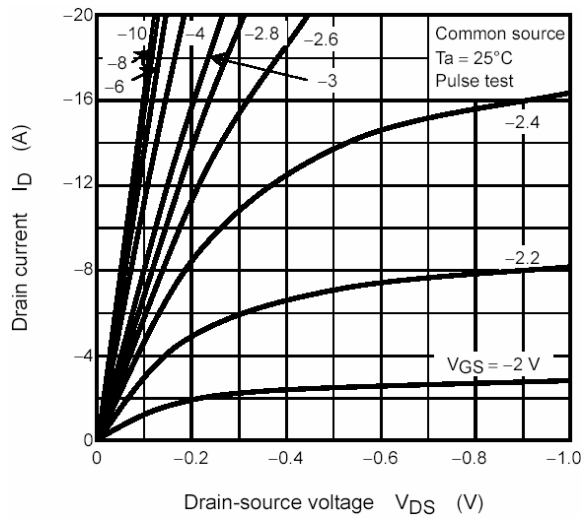
| Parameter                       | Symbol          | Min. | Typ. | Max. | Unit | Test Conditions                           |
|---------------------------------|-----------------|------|------|------|------|-------------------------------------------|
| Forward On Voltage <sup>2</sup> | V <sub>SD</sub> | -    | -    | -1.2 | V    | I <sub>S</sub> =-13A, V <sub>GS</sub> =0V |

Notes: 1. Pulse width limited by Max. junction temperature.

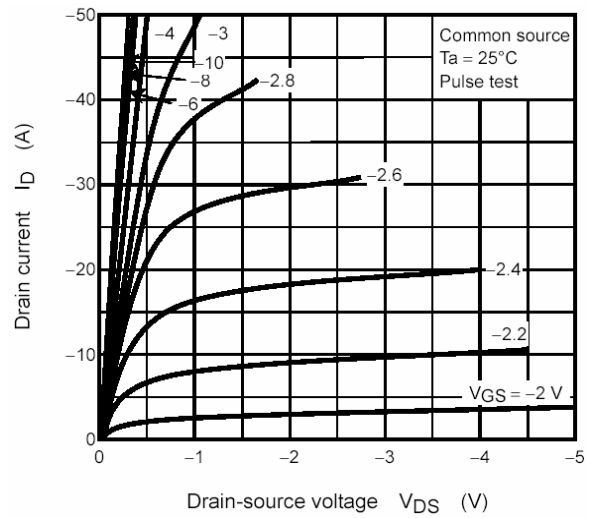
2. Pulse width ≤ 300us, duty cycle ≤ 2%.

3. Surface mounted on 1 in<sup>2</sup> copper pad of FR4 board; 125°C/W when mounted on Min. copper pad.

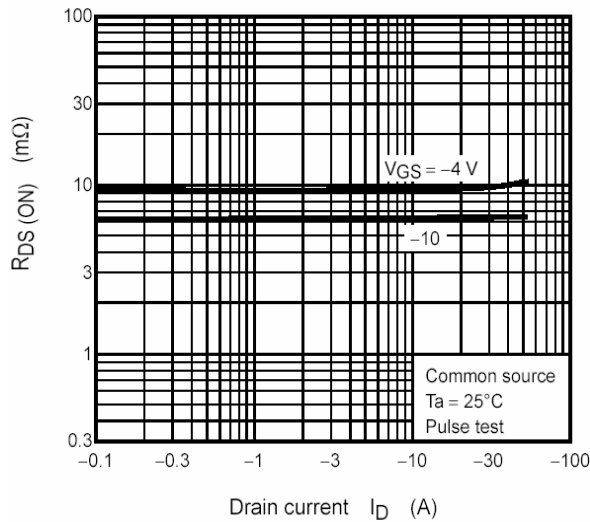
## Characteristics Curve



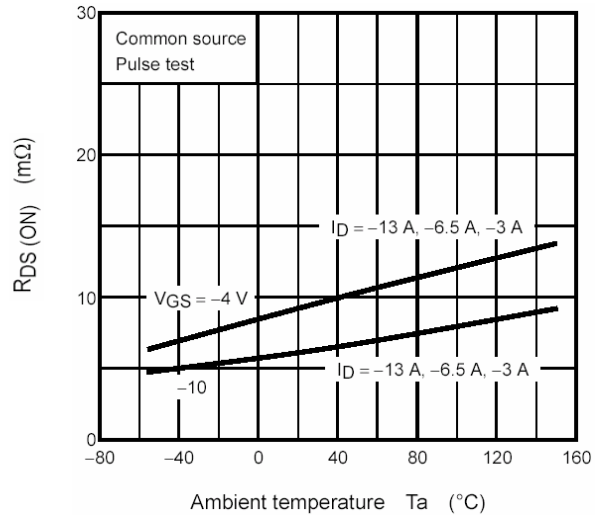
**Fig 1. Typical Output Characteristics**



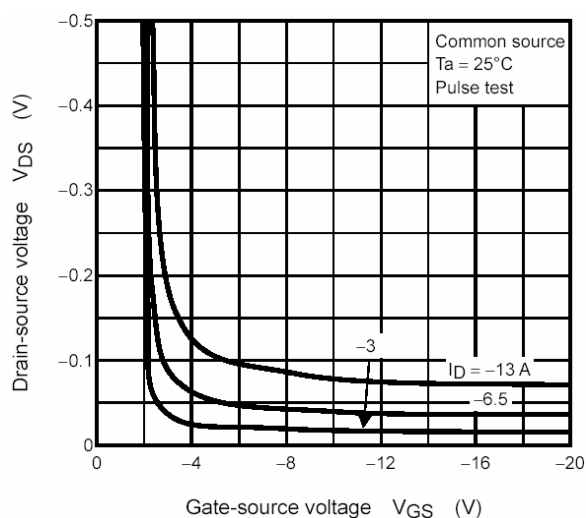
**Fig 2. Typical Output Characteristics**



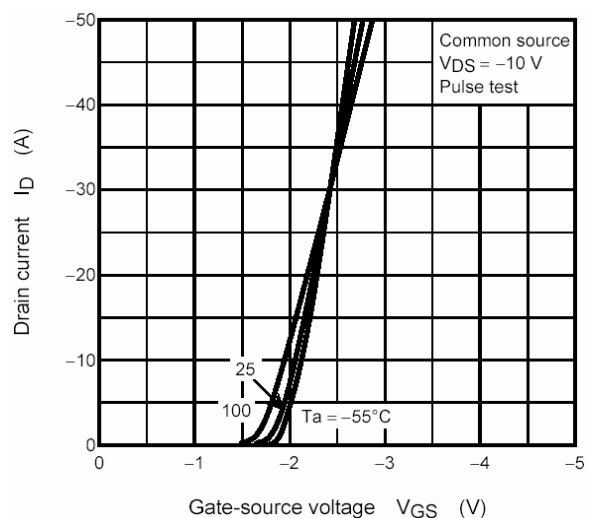
**Fig 3. On-Resistance v.s. Drain Current**



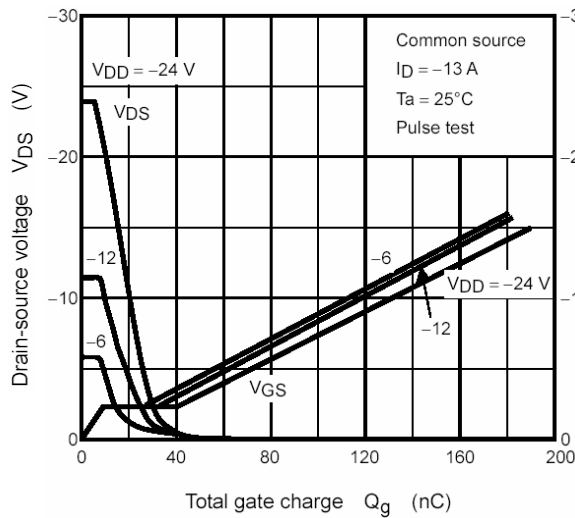
**Fig 4. On-Resistance  
v.s. Ambient Temperature**



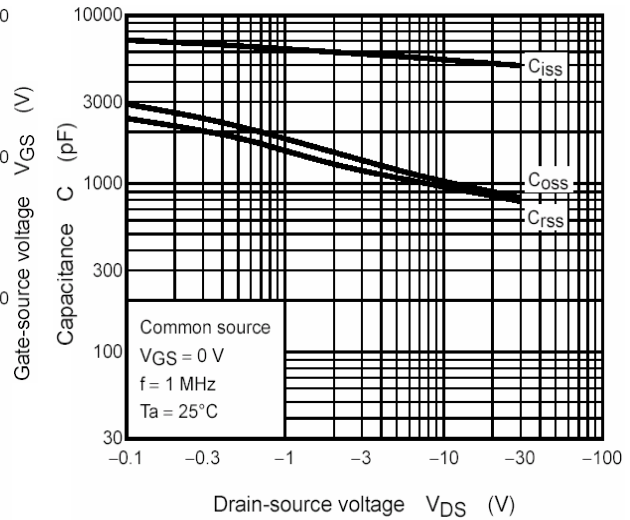
**Fig 5. Drain-Source Voltage  
v.s. Gate-Source Voltage**



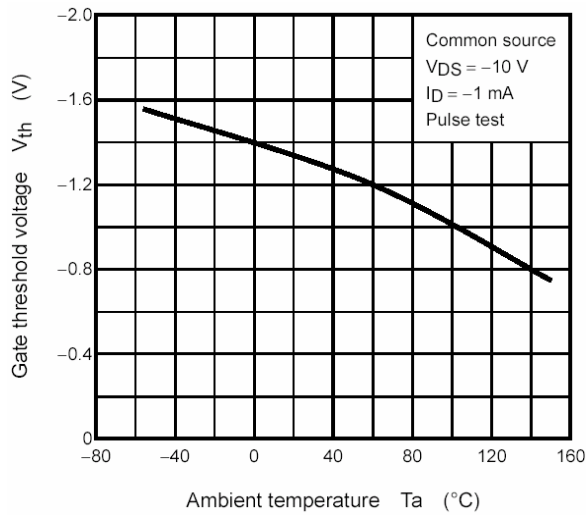
**Fig 6. Drain Current  
v.s. Gate-Source Voltage**



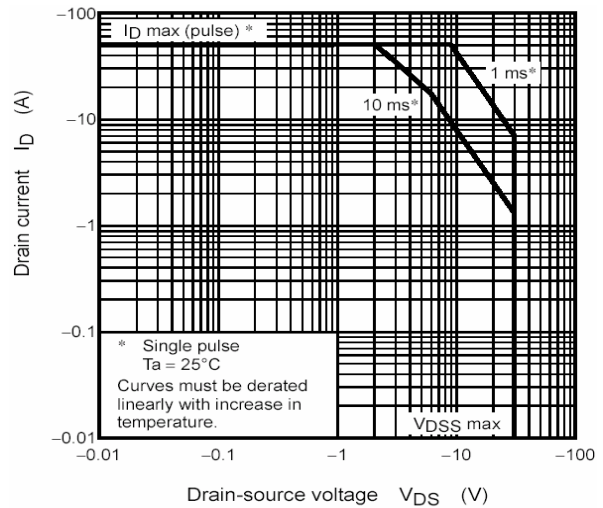
**Fig 7. Gate Charge Characteristics**



**Fig 8. Typical Capacitance Characteristics**



**Fig 9. Threshold Voltage**



**Fig 10. Safe Operating Area**

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