

**GTC217E****N-CHANNEL ENHANCEMENT MODE POWER MOSFET**

|                     |      |
|---------------------|------|
| BV <sub>DSS</sub>   | 20V  |
| R <sub>DS(ON)</sub> | 22mΩ |
| I <sub>D</sub>      | 7A   |

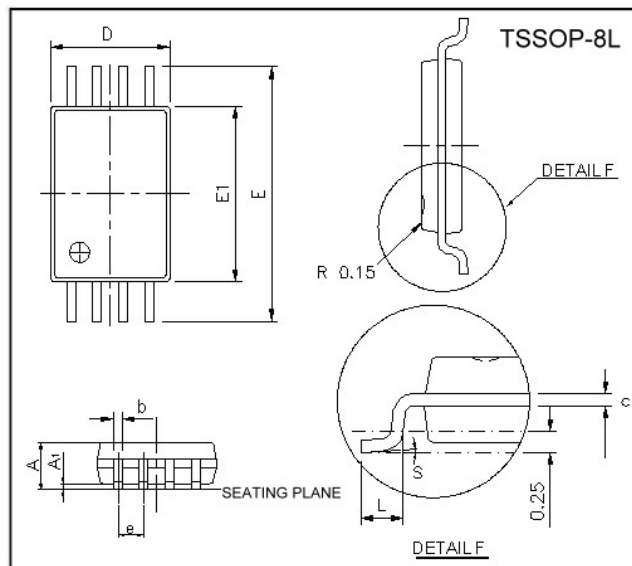
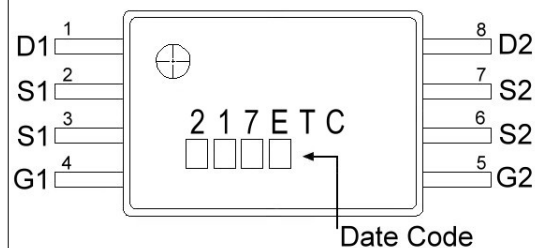
**Description**

The GTC217E used advanced trench technology to provide excellent on-resistance extremely efficient and cost-effectiveness device.

The GTC217E is universally used for all commercial-industrial applications.

**Features**

- \* Lower Gate Charge
- \* Small Package Outline
- \* RoHS Compliant

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

| REF. | Millimeter |      | REF. | Millimeter |      |
|------|------------|------|------|------------|------|
|      | Min.       | Max. |      | Min.       | Max. |
| A    | -          | 1.20 | E    | 6.20       | 6.60 |
| A1   | 0.05       | 0.15 | E1   | 4.30       | 4.50 |
| b    | 0.19       | 0.30 | e    | 0.65 BSC   |      |
| c    | 0.09       | 0.20 | L    | 0.45       | 0.75 |
| D    | 2.90       | 3.10 | S    | 0°         | 8°   |

**Absolute Maximum Ratings**

| Parameter                                        | Symbol                            | Ratings    | Unit |
|--------------------------------------------------|-----------------------------------|------------|------|
| Drain-Source Voltage                             | V <sub>DS</sub>                   | 20         | V    |
| Gate-Source Voltage                              | V <sub>GS</sub>                   | ±12        | V    |
| Continuous Drain Current <sup>3</sup>            | I <sub>D</sub> @TA=25°C           | 7          | A    |
| Continuous Drain Current <sup>3</sup>            | I <sub>D</sub> @TA=70°C           | 5.7        | A    |
| Pulsed Drain Current <sup>1,2</sup>              | I <sub>DM</sub>                   | 30         | A    |
| Total Power Dissipation                          | P <sub>D</sub> @TA=25°C           | 1.5        | W    |
| Linear Derating Factor                           |                                   | 0.012      | W/°C |
| Operating Junction and Storage Temperature Range | T <sub>j</sub> , T <sub>stg</sub> | -55 ~ +150 | °C   |

**Thermal Data**

| Parameter                                             | Symbol             | Value | Unit |
|-------------------------------------------------------|--------------------|-------|------|
| Thermal Resistance Junction-ambient <sup>3</sup> Max. | R <sub>thj-a</sub> | 83    | °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>   | 20   | -    | -    | V    | V <sub>GS</sub> =0, I <sub>D</sub> =250uA                                                                        |
| Gate Threshold Voltage                             | V <sub>GS(th)</sub> | 0.5  | -    | 1.0  | V    | V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250uA                                                         |
| Forward Transconductance                           | g <sub>fs</sub>     | -    | 24   | -    | S    | V <sub>DS</sub> =5V, I <sub>D</sub> =7A                                                                          |
| Gate-Source Leakage Current                        | I <sub>GSS</sub>    | -    | -    | ±10  | uA   | V <sub>GS</sub> = ±10V                                                                                           |
| Drain-Source Leakage Current(T <sub>j</sub> =25°C) | I <sub>DSS</sub>    | -    | -    | 1    | uA   | V <sub>DS</sub> =16V, V <sub>GS</sub> =0                                                                         |
| Drain-Source Leakage Current(T <sub>j</sub> =55°C) |                     | -    | -    | 5    | uA   | V <sub>DS</sub> =16V, V <sub>GS</sub> =0                                                                         |
| Static Drain-Source On-Resistance                  | R <sub>DS(ON)</sub> | -    | -    | 22   | mΩ   | V <sub>GS</sub> =4.5V, I <sub>D</sub> =6.6A                                                                      |
|                                                    |                     | -    | -    | 30   |      | V <sub>GS</sub> =2.5V, I <sub>D</sub> =5.5A                                                                      |
| Total Gate Charge <sup>2</sup>                     | Q <sub>g</sub>      | -    | 9.3  | -    | nC   | I <sub>D</sub> =7A<br>V <sub>DS</sub> =10V<br>V <sub>GS</sub> =4.5V                                              |
| Gate-Source Charge                                 | Q <sub>gs</sub>     | -    | 0.6  | -    |      |                                                                                                                  |
| Gate-Drain ("Miller") Change                       | Q <sub>gd</sub>     | -    | 3.6  | -    |      |                                                                                                                  |
| Turn-on Delay Time <sup>2</sup>                    | T <sub>d(on)</sub>  | -    | 820  | -    | ns   | V <sub>DS</sub> =10V<br>I <sub>D</sub> =1A<br>V <sub>GS</sub> =4.5V<br>R <sub>G</sub> =6Ω<br>R <sub>L</sub> =10Ω |
| Rise Time                                          | T <sub>r</sub>      | -    | 934  | -    |      |                                                                                                                  |
| Turn-off Delay Time                                | T <sub>d(off)</sub> | -    | 860  | -    |      |                                                                                                                  |
| Fall Time                                          | T <sub>f</sub>      | -    | 510  | -    |      |                                                                                                                  |
| Input Capacitance                                  | C <sub>iss</sub>    | -    | 231  | -    | pF   | V <sub>GS</sub> =0V<br>V <sub>DS</sub> =10V<br>f=1.0MHz                                                          |
| Output Capacitance                                 | C <sub>oss</sub>    | -    | 164  | -    |      |                                                                                                                  |
| Reverse Transfer Capacitance                       | C <sub>rss</sub>    | -    | 137  | -    |      |                                                                                                                  |

**Source-Drain Diode**

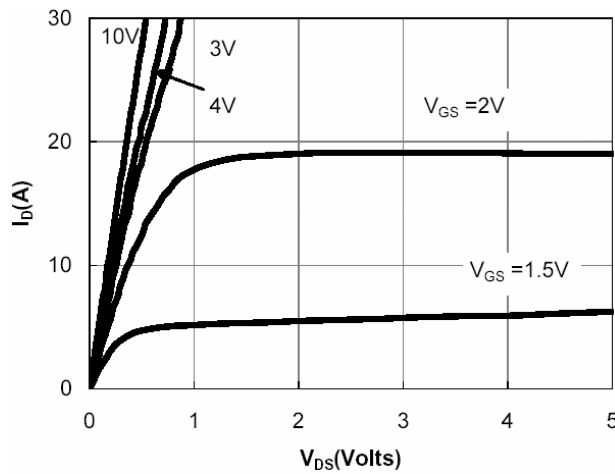
| Parameter                              | Symbol          | Min. | Typ. | Max. | Unit | Test Conditions                                          |
|----------------------------------------|-----------------|------|------|------|------|----------------------------------------------------------|
| Forward On Voltage <sup>2</sup>        | V <sub>SD</sub> | -    | -    | 1.0  | V    | I <sub>S</sub> =1.0A, V <sub>GS</sub> =0V                |
| Reverse Recovery Time <sup>2</sup>     | T <sub>rr</sub> | -    | 15.2 | -    | ns   | I <sub>S</sub> =7A, V <sub>GS</sub> =0V<br>dI/dt=100A/μs |
| Reverse Recovery Charge                | Q <sub>rr</sub> | -    | 6.3  | -    | nC   |                                                          |
| Continuous Source Current (Body Diode) | I <sub>S</sub>  | -    | -    | 2.5  | A    | V <sub>D</sub> =V <sub>G</sub> =0V, V <sub>S</sub> =1.0V |

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

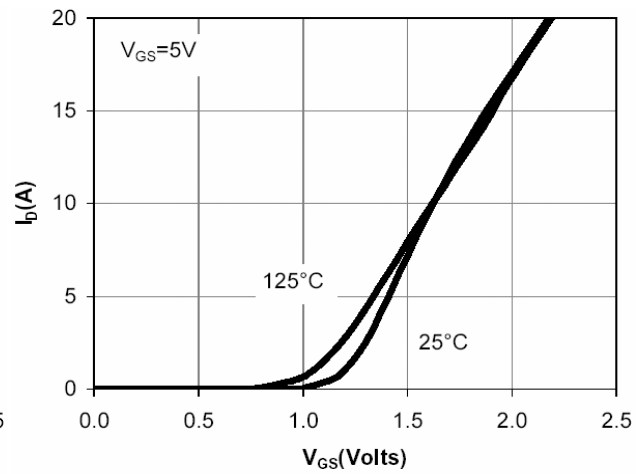
2. Pulse width ≤ 300us, duty cycle ≤ 2%.

3. Surface mounted on FR4 board, t ≤ 10sec.

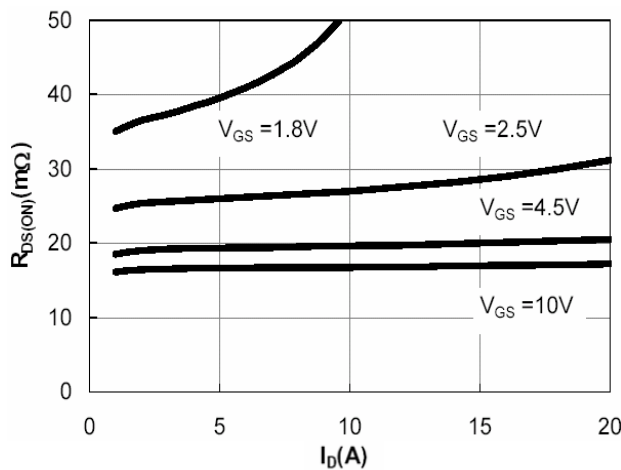
## Characteristics Curve



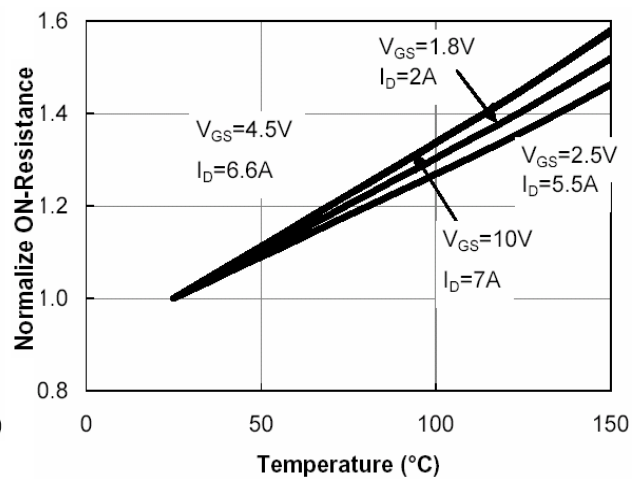
**Fig 1. Typical Output Characteristics**



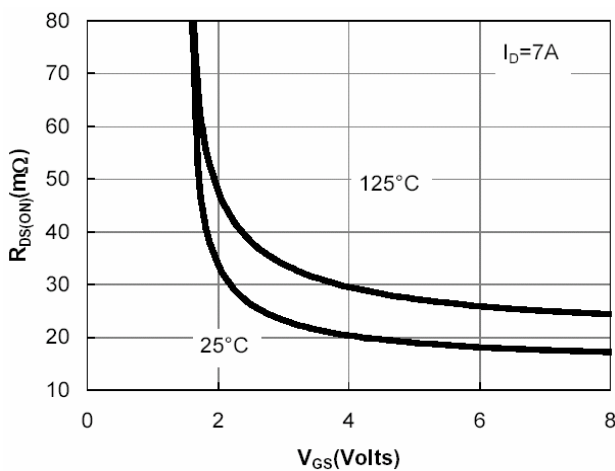
**Fig 2. Transfer Characteristics**



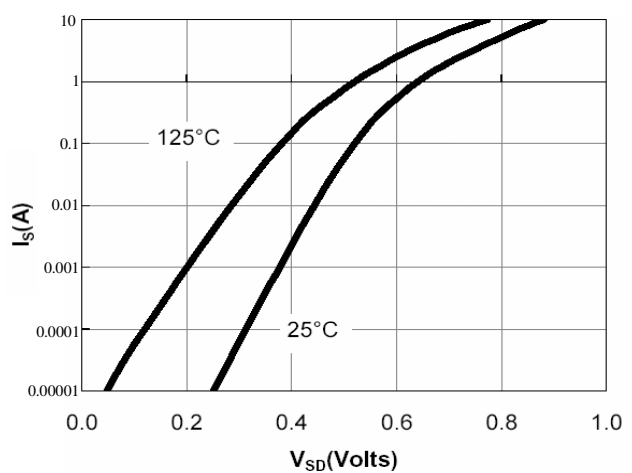
**Fig 3. On-Resistance v.s. Drain Current and Gate Voltage**



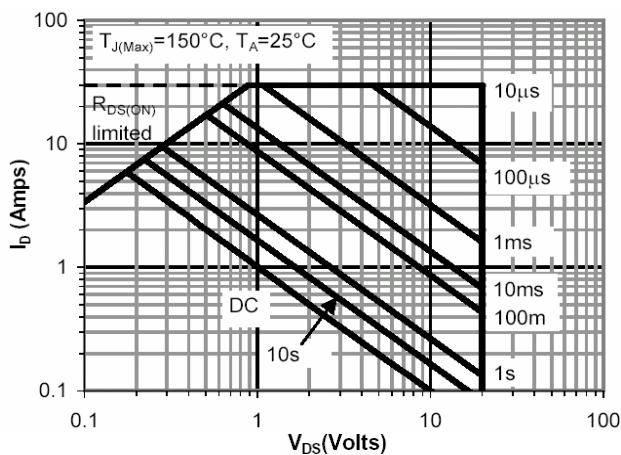
**Fig 4. On-Resistance v.s. Junction Temperature**



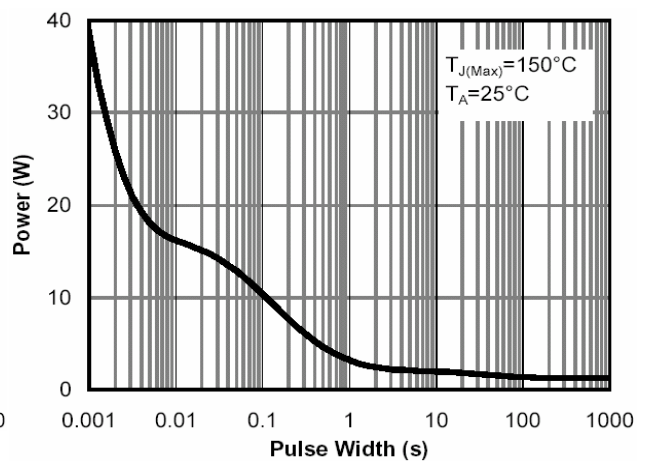
**Fig 5. On-Resistance v.s. Gate-Source Voltage**



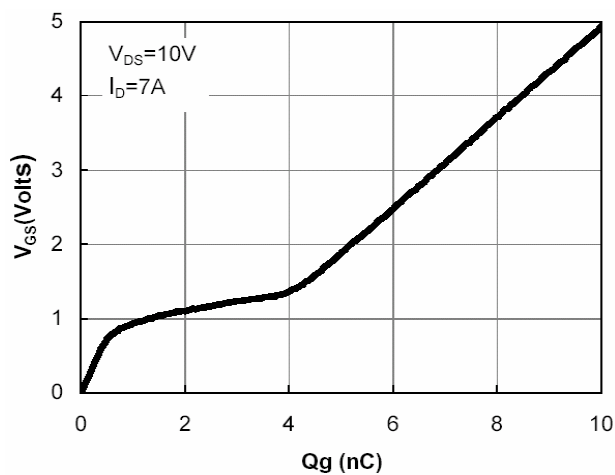
**Fig 6. Body Diode Characteristics**



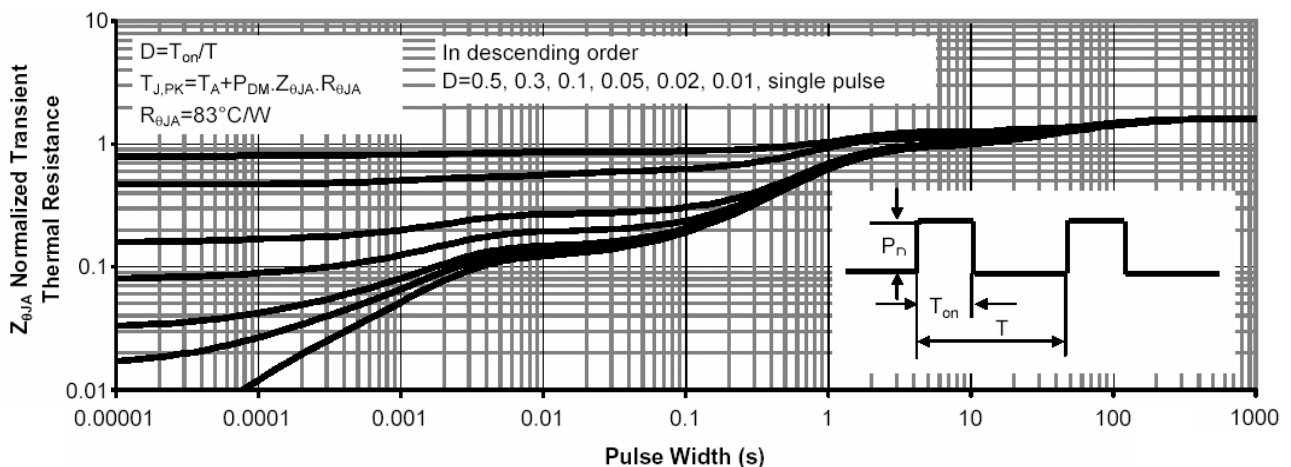
**Fig 7. Maximum Safe Operating Area**



**Fig 8. Single Pulse Power Rating Junction-to-Ambient**



**Fig 9. Gate Charge Characteristics**



**Fig 10. Normalized Maximum Transient Thermal Impedance**

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