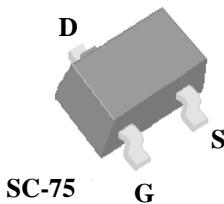
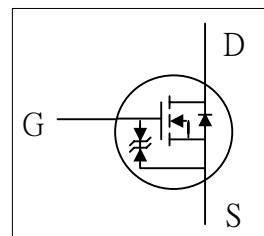




- ▼ Lower Gate Charge
- ▼ Gate Pateded Diode
- ▼ Small Package Outline
- ▼ RoHS Compliant & Halogen-Free



|              |       |
|--------------|-------|
| $BV_{DSS}$   | 20V   |
| $R_{DS(ON)}$ | 0.9 Ω |
| $I_D$        | 450mA |



## Description

Advanced Power MOSFETs from APEC provide the designer with the best combination of fast switching, low on-resistance and cost-effectiveness.

SC-75 with 1.6x1.6mm very small footprint and suited for hand held applications.

## Absolute Maximum Ratings

| Symbol                   | Parameter                             | Rating     | Unit |
|--------------------------|---------------------------------------|------------|------|
| $V_{DS}$                 | Drain-Source Voltage                  | 20         | V    |
| $V_{GS}$                 | Gate-Source Voltage                   | $\pm 6$    | V    |
| $I_D @ T_A = 25^\circ C$ | Continuous Drain Current <sup>3</sup> | 450        | mA   |
| $I_D @ T_A = 70^\circ C$ | Continuous Drain Current <sup>3</sup> | 360        | mA   |
| $I_{DM}$                 | Pulsed Drain Current <sup>1</sup>     | 1          | A    |
| $P_D @ T_A = 25^\circ C$ | Total Power Dissipation               | 0.35       | W    |
| $T_{STG}$                | Storage Temperature Range             | -55 to 150 | °C   |
| $T_J$                    | Operating Junction Temperature Range  | -55 to 150 | °C   |

## Thermal Data

| Symbol      | Parameter   | Value | Unit |
|-------------|---|-------|------|
| $R_{thj-a}$ | Maximum Thermal Resistance, Junction-ambient <sup>3</sup> | 420   | °C/W |



## Electrical Characteristics@ $T_j=25^\circ\text{C}$ (unless otherwise specified)

| Symbol                     | Parameter                                      | Test Conditions  | Min. | Typ. | Max.     | Unit          |
|----------------------------|--|--|------|------|----------|---------------|
| $\text{BV}_{\text{DSS}}$   | Drain-Source Breakdown Voltage                 | $\text{V}_{\text{GS}}=0\text{V}, \text{I}_D=250\mu\text{A}$            | 20   | -    | -        | V             |
| $\text{R}_{\text{DS(ON)}}$ | Static Drain-Source On-Resistance <sup>2</sup> | $\text{V}_{\text{GS}}=4.5\text{V}, \text{I}_D=400\text{mA}$            | -    | -    | 0.9      | $\Omega$      |
|                            |  | $\text{V}_{\text{GS}}=2.5\text{V}, \text{I}_D=300\text{mA}$            | -    | -    | 2        | $\Omega$      |
|                            |  | $\text{V}_{\text{GS}}=1.8\text{V}, \text{I}_D=200\text{mA}$            | -    | -    | 3        | $\Omega$      |
| $\text{V}_{\text{GS(th)}}$ | Gate Threshold Voltage                         | $\text{V}_{\text{DS}}=\text{V}_{\text{GS}}, \text{I}_D=250\mu\text{A}$ | 0.25 | -    | 1        | V             |
| $\text{g}_{\text{fs}}$     | Forward Transconductance                       | $\text{V}_{\text{DS}}=5\text{V}, \text{I}_D=400\text{mA}$              | -    | 1.3  | -        | S             |
| $\text{I}_{\text{DSS}}$    | Drain-Source Leakage Current                   | $\text{V}_{\text{DS}}=16\text{V}, \text{V}_{\text{GS}}=0\text{V}$      | -    | -    | 10       | $\mu\text{A}$ |
| $\text{I}_{\text{GSS}}$    | Gate-Source Leakage                            | $\text{V}_{\text{GS}}=\pm 6\text{V}, \text{V}_{\text{DS}}=0\text{V}$   | -    | -    | $\pm 30$ | $\mu\text{A}$ |
| $\text{Q}_{\text{g}}$      | Total Gate Charge                              | $\text{I}_D=400\text{mA}$  | -    | 1.2  | 1.9      | nC            |
| $\text{Q}_{\text{gs}}$     | Gate-Source Charge                             |  | -    | 0.3  | -        | nC            |
| $\text{Q}_{\text{gd}}$     | Gate-Drain ("Miller") Charge                   |  | -    | 0.3  | -        | nC            |
| $\text{t}_{\text{d(on)}}$  | Turn-on Delay Time                             | $\text{V}_{\text{DS}}=10\text{V}$                                      | -    | 18   | -        | ns            |
| $\text{t}_r$               | Rise Time                                      | $\text{I}_D=400\text{mA}$  | -    | 34   | -        | ns            |
| $\text{t}_{\text{d(off)}}$ | Turn-off Delay Time                            | $\text{R}_G=3.3\Omega$   | -    | 110  | -        | ns            |
| $\text{t}_f$               | Fall Time                                      | $\text{V}_{\text{GS}}=5\text{V}$                                       | -    | 115  | -        | ns            |
| $\text{C}_{\text{iss}}$    | Input Capacitance                              | $\text{V}_{\text{GS}}=0\text{V}$                                       | -    | 45   | 72       | pF            |
| $\text{C}_{\text{oss}}$    | Output Capacitance                             | $\text{V}_{\text{DS}}=10\text{V}$                                      | -    | 22   | -        | pF            |
| $\text{C}_{\text{rss}}$    | Reverse Transfer Capacitance                   | f=1.0MHz   | -    | 12   | -        | pF            |

## Source-Drain Diode

| Symbol                 | Parameter                       | Test Conditions   | Min. | Typ. | Max. | Unit |
|------------------------|---------------------------------|---|------|------|------|------|
| $\text{V}_{\text{SD}}$ | Forward On Voltage <sup>2</sup> | $\text{I}_S=300\text{mA}, \text{V}_{\text{GS}}=0\text{V}$ | -    | -    | 1.2  | V    |

### Notes:

- 1.Pulse width limited by Max. junction temperature.
- 2.Pulse test.
- 3.Surface mounted on FR4 board.

THIS PRODUCT IS SENSITIVE TO ELECTROSTATIC DISCHARGE, PLEASE HANDLE WITH CAUTION.

USE OF THIS PRODUCT AS A CRITICAL COMPONENT IN LIFE SUPPORT OR OTHER SIMILAR SYSTEMS IS NOT AUTHORIZED.

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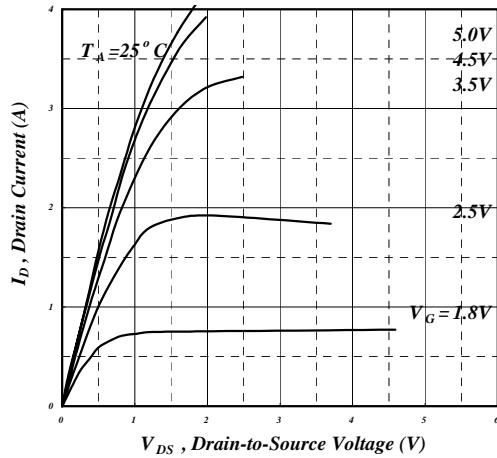


Fig 1. Typical Output Characteristics

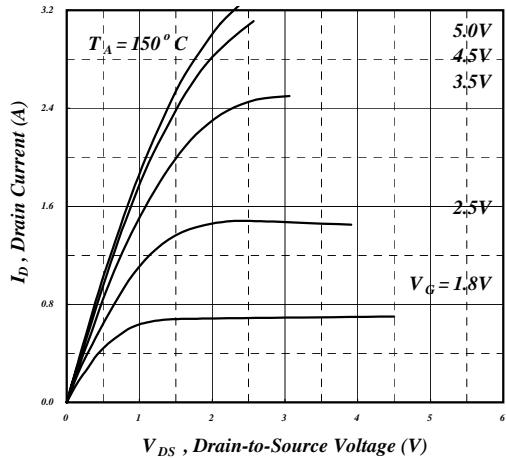


Fig 2. Typical Output Characteristics

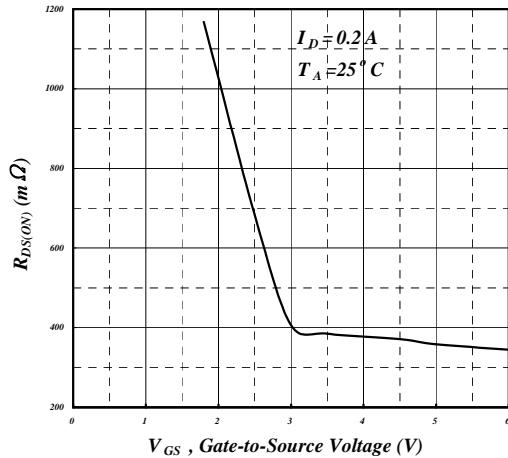


Fig 3. On-Resistance v.s. Gate Voltage

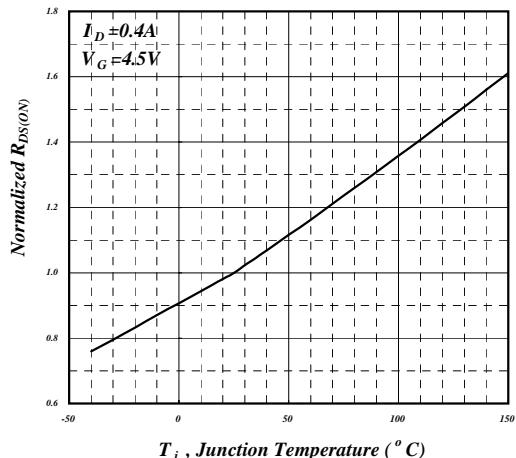


Fig 4. Normalized On-Resistance v.s. Junction Temperature

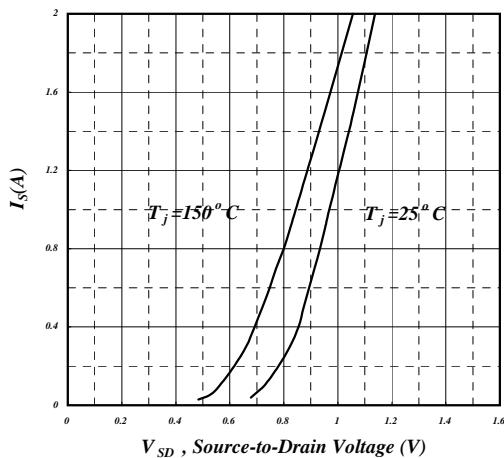


Fig 5. Forward Characteristic of Reverse Diode

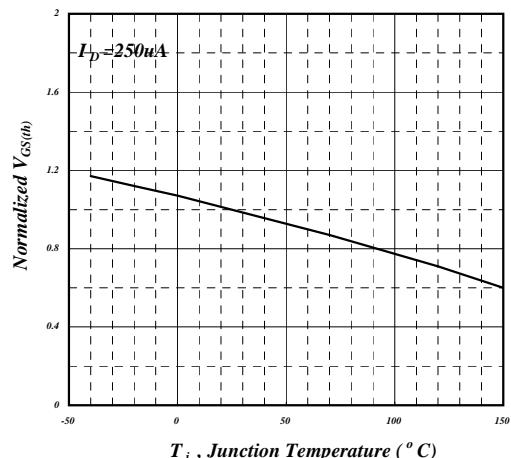
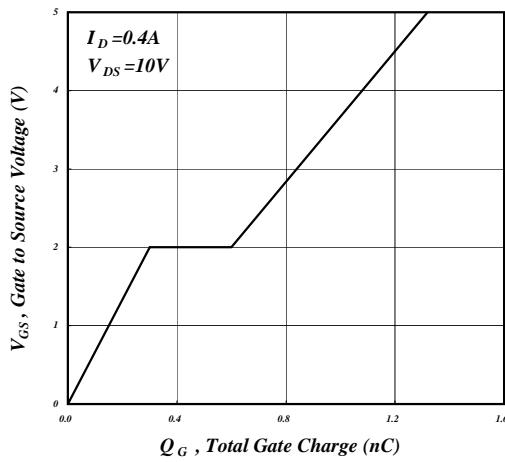
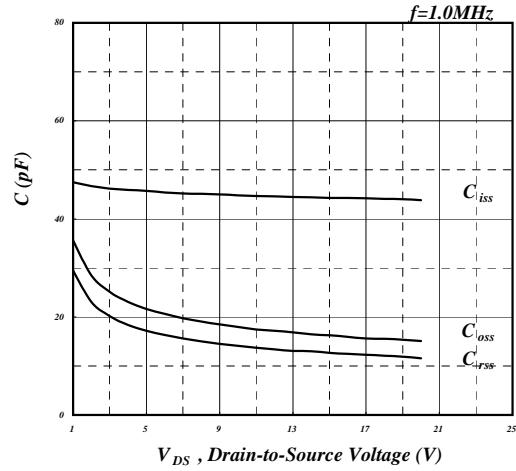


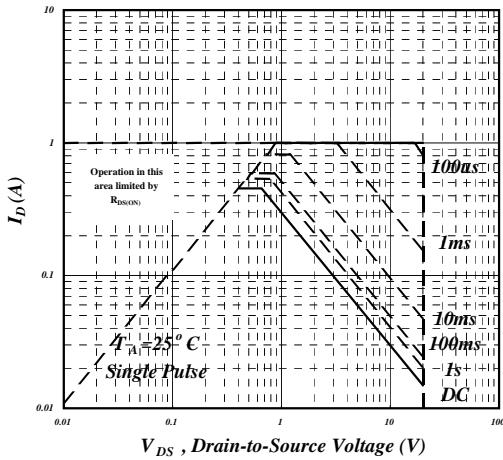
Fig 6. Gate Threshold Voltage v.s. Junction Temperature



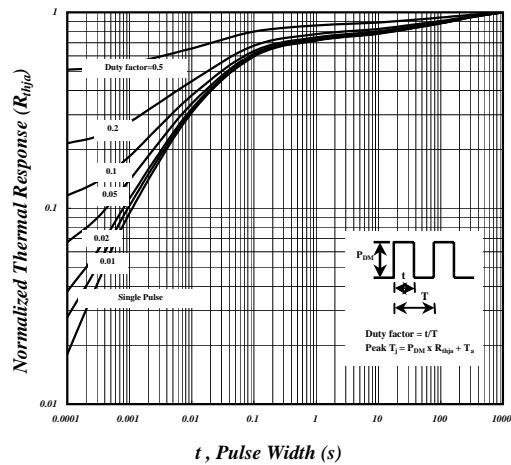
**Fig 7. Gate Charge Characteristics**



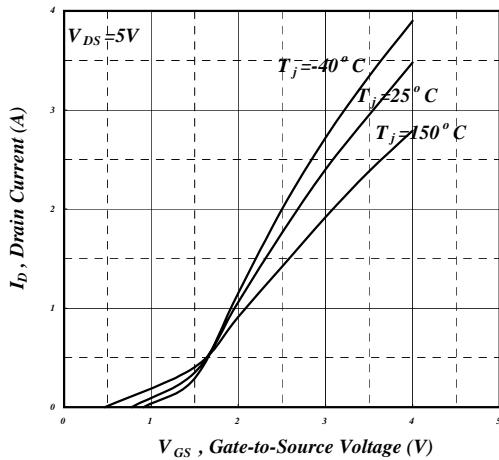
**Fig 8. Typical Capacitance Characteristics**



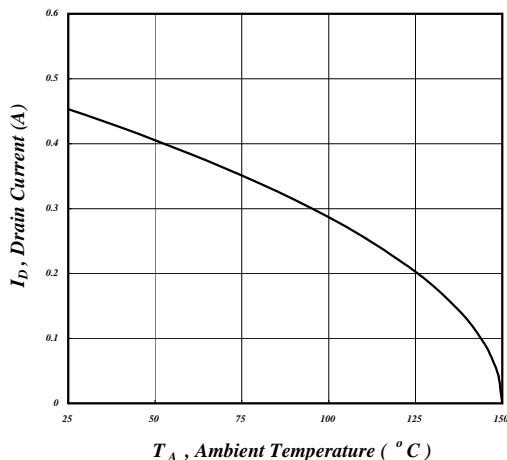
**Fig 9. Maximum Safe Operating Area**



**Fig 10. Effective Transient Thermal Impedance**



**Fig 11. Transfer Characteristics**



**Fig 12. Maximum Continuous Drain Current v.s. Ambient Temperature**