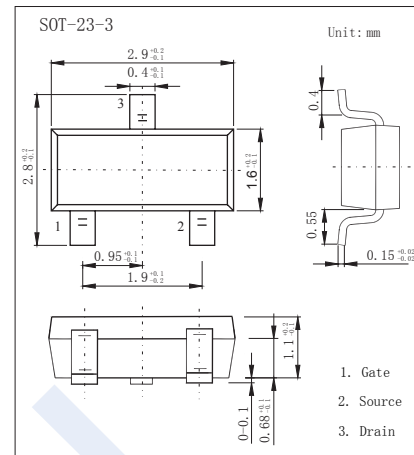
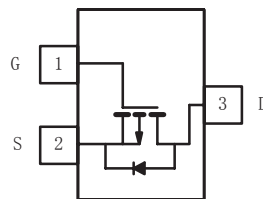


## P-Channel Enhancement MOSFET

### SI2333CDS (KI2333CDS)

#### ■ Features

- $V_{DS}$  (V) = -12V
- $I_D$  = -5.1A ( $V_{GS}$  = -4.5V)
- $R_{DS(ON)}$  < 35m $\Omega$  ( $V_{GS}$  = -4.5V)
- $R_{DS(ON)}$  < 45m $\Omega$  ( $V_{GS}$  = -2.5V)
- $R_{DS(ON)}$  < 59m $\Omega$  ( $V_{GS}$  = -1.8V)



#### ■ Absolute Maximum Ratings $T_a = 25^\circ\text{C}$

| Parameter   | Symbol     | 5 sec                    | Steady State | Unit                      |   |
|---|------------|--------------------------|--------------|---------------------------|---|
| Drain-Source Voltage                                      | $V_{DS}$   | -12                      |              | V                         |   |
| Gate-Source Voltage                                       | $V_{GS}$   | $\pm 8$                  |              |                           |   |
| Continuous Drain Current ( $T_J = 150^\circ\text{C}$ ) *1 | $I_D$      | $T_a = 25^\circ\text{C}$ | -7.1         | -5.1                      | A |
|   |            | $T_a = 70^\circ\text{C}$ | -5.7         | -4.0                      |   |
| Pulsed Drain Current                                      | $I_{DM}$   | -20                      |              |                           |   |
| Power Dissipation   | $P_D$      | $T_a = 25^\circ\text{C}$ | 2.5          | 1.25                      | W |
|   |            | $T_a = 70^\circ\text{C}$ | 1.6          | 0.8                       |   |
| Thermal Resistance.Junction- to-Ambient                   | $R_{thJA}$ | 100                      |              | $^\circ\text{C}/\text{W}$ |   |
| Thermal Resistance.Junction- to-Foot                      | $R_{thJF}$ | 50                       |              |                           |   |
| Junction Temperature                                      | $T_J$      | 150                      |              | $^\circ\text{C}$          |   |
| Storage Temperature Range                                 | $T_{stg}$  | -55 to 150               |              |                           |   |

\*1 Surface Mounted on 1" x 1" FR4 Board.

## P-Channel Enhancement MOSFET

### SI2333CDS (KI2333CDS)

#### ■ Electrical Characteristics Ta = 25°C

| Parameter                             | Symbol              | Test Conditions   | Min  | Typ  | Max  | Unit |
|---------------------------------------|---------------------|---|------|------|------|------|
| Drain-Source Breakdown Voltage        | V <sub>DSS</sub>    | I <sub>D</sub> =-250 μA, V <sub>GS</sub> =0V  | -12  |      |      | V    |
| Zero Gate Voltage Drain Current       | I <sub>DSS</sub>    | V <sub>DS</sub> =-12V, V <sub>GS</sub> =0V  |      |      | -1   | μA   |
|                                       |                     | V <sub>DS</sub> =-12V, V <sub>GS</sub> =0V, T <sub>J</sub> =55°C  |      |      | -10  |      |
| Gate-Body leakage current             | I <sub>GSS</sub>    | V <sub>DS</sub> =0V, V <sub>GS</sub> =±8V   |      |      | ±100 | nA   |
| Gate Threshold Voltage                | V <sub>GS(th)</sub> | V <sub>DS</sub> =V <sub>GS</sub> I <sub>D</sub> =-250 μA  | -0.4 |      | -1   | V    |
| Static Drain-Source On-Resistance *1  | R <sub>DS(on)</sub> | V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-5.1A   |      | 28.5 | 35   | mΩ   |
|                                       |                     | V <sub>GS</sub> =-2.5V, I <sub>D</sub> =-4.5A   |      | 36   | 45   |      |
|                                       |                     | V <sub>GS</sub> =-1.8V, I <sub>D</sub> =-2.0A   |      | 46   | 59   |      |
| On state drain current *1             | I <sub>D(ON)</sub>  | V <sub>GS</sub> =-4.5V, V <sub>DS</sub> =-5V  | -20  |      |      | A    |
| Forward Transconductance *1           | g <sub>FS</sub>     | V <sub>DS</sub> =-5V, I <sub>D</sub> =-1.9A   |      | 1.6  |      | S    |
| Gate Resistance                       | R <sub>g</sub>      | f=1.0MHz  |      | 4.0  |      | Ω    |
| Input Capacitance                     | C <sub>iss</sub>    | V <sub>GS</sub> =0V, V <sub>DS</sub> =-6V, f=1MHz   |      | 1225 |      | pF   |
| Output Capacitance                    | C <sub>oss</sub>    |   |      | 315  |      |      |
| Reverse Transfer Capacitance          | C <sub>rss</sub>    |   |      | 260  |      |      |
| Total Gate Charge                     | Q <sub>g</sub>      | V <sub>GS</sub> =-4.5V, V <sub>DS</sub> =-6V, I <sub>D</sub> =-5.1A   |      | 15   | 25   | nC   |
|                                       |                     |   |      | 9    | 15   |      |
| Gate Source Charge                    | Q <sub>gs</sub>     | V <sub>GS</sub> =-2.5V, V <sub>DS</sub> =-6V, I <sub>D</sub> =-5.1A   |      | 1.9  |      |      |
| Gate Drain Charge                     | Q <sub>gd</sub>     |   |      | 3.8  |      |      |
| Turn-On DelayTime                     | t <sub>d(on)</sub>  | V <sub>GS</sub> =-4.5V, V <sub>DS</sub> =-6V, R <sub>L</sub> =6Ω, R <sub>GEN</sub> =1Ω<br><br>I <sub>D</sub> =-1.0A |      | 13   | 20   | ns   |
| Turn-On Rise Time                     | t <sub>r</sub>      |   |      | 35   | 60   |      |
| Turn-Off DelayTime                    | t <sub>d(off)</sub> |   |      | 45   | 70   |      |
| Turn-Off Fall Time                    | t <sub>f</sub>      |   |      | 12   | 20   |      |
| Body Diode Reverse Recovery Charge    | Q <sub>rr</sub>     | I <sub>F</sub> = 1.0 A, di/dt = 100 A/ us, T <sub>J</sub> =25°C   |      | 20   | 40   | nC   |
| Body Diode Reverse Recovery Time      | t <sub>rr</sub>     |   |      | 32   | 50   | ns   |
| Reverse Recovery Fall Time            | t <sub>a</sub>      |   |      | 16   |      |      |
| Reverse Recovery Rise Time            | t <sub>b</sub>      |   |      | 16   |      |      |
| Maximum Body-Diode Continuous Current | I <sub>S</sub>      | T <sub>C</sub> =25°C  |      |      | -1.0 | A    |
| Pulse Diode Forward Current *1        | I <sub>SM</sub>     |   |      |      | -20  |      |
| Diode Forward Voltage                 | V <sub>SD</sub>     | I <sub>S</sub> =-1.0A, V <sub>GS</sub> =0V  |      | -0.7 | -1.2 | V    |

\*1Pulse test: PW ≤ 300us duty cycle ≤ 2%.

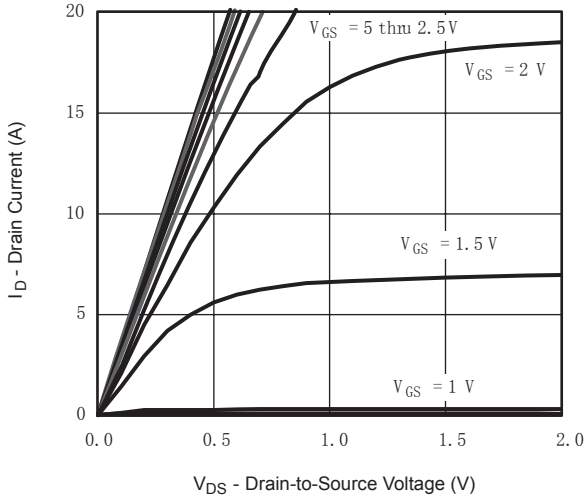
#### ■ Marking

|         |     |
|---------|-----|
| Marking | O3* |
|---------|-----|

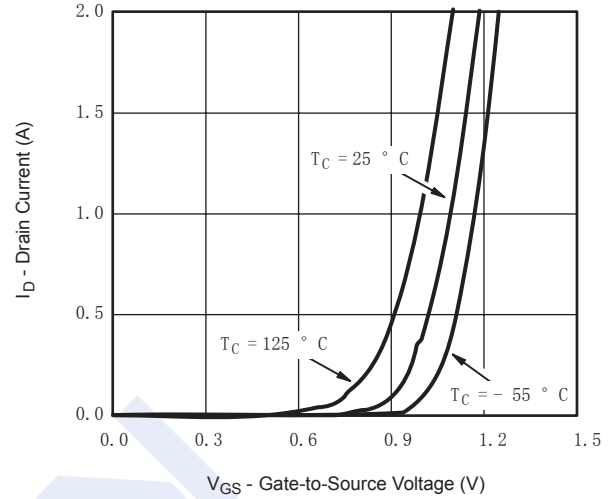
## P-Channel Enhancement MOSFET

### SI2333CDS (KI2333CDS)

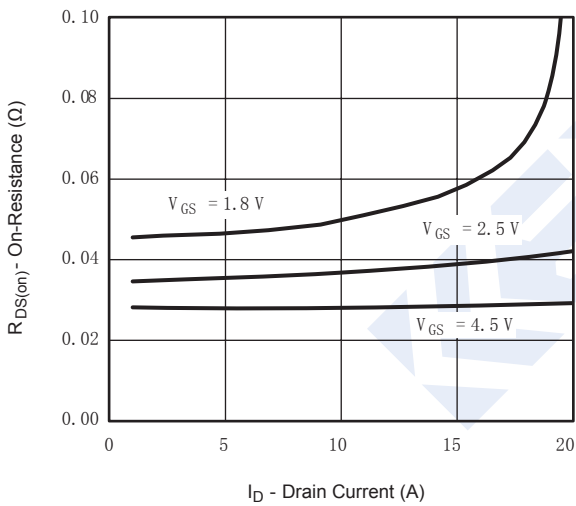
■ Typical Characteristics



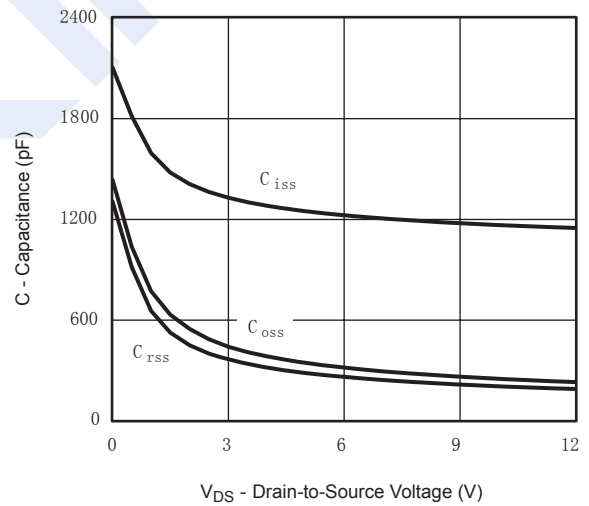
Output Characteristics



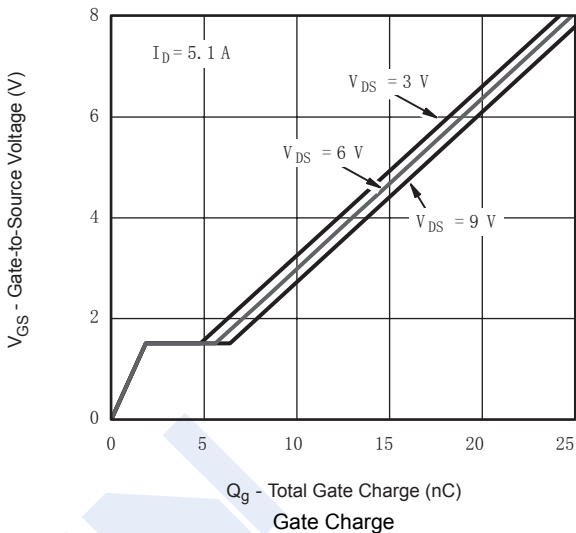
Transfer Characteristics



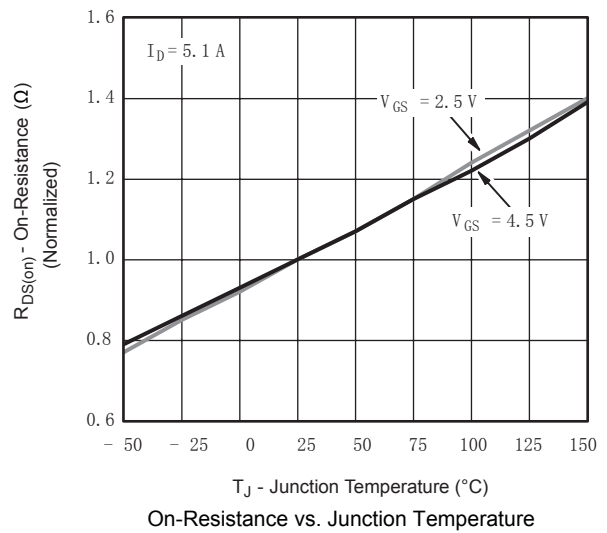
On-Resistance vs. Drain Current and Gate Voltage



Capacitance



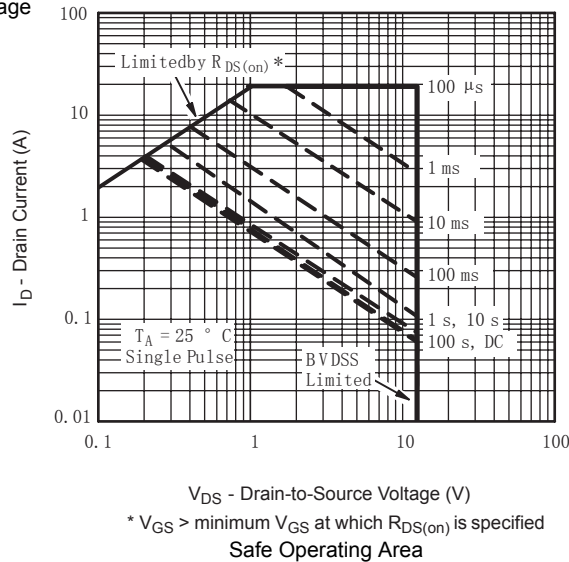
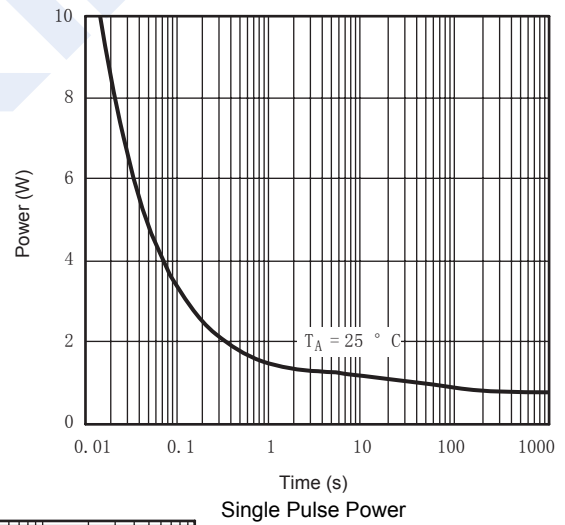
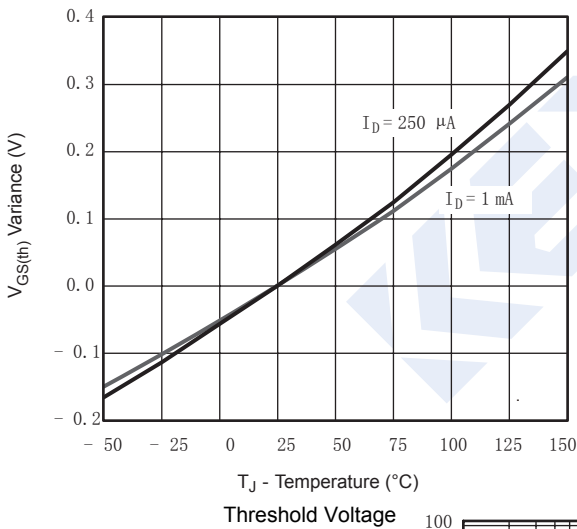
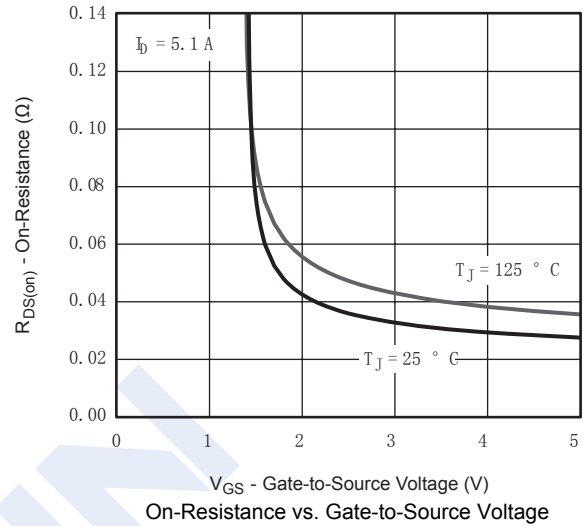
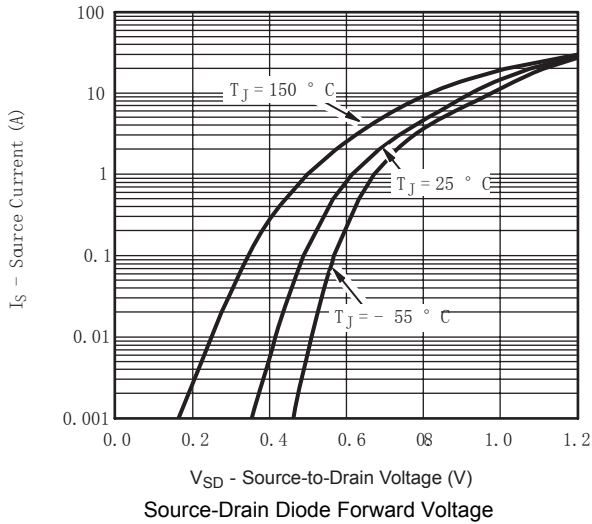
Gate Charge



On-Resistance vs. Junction Temperature

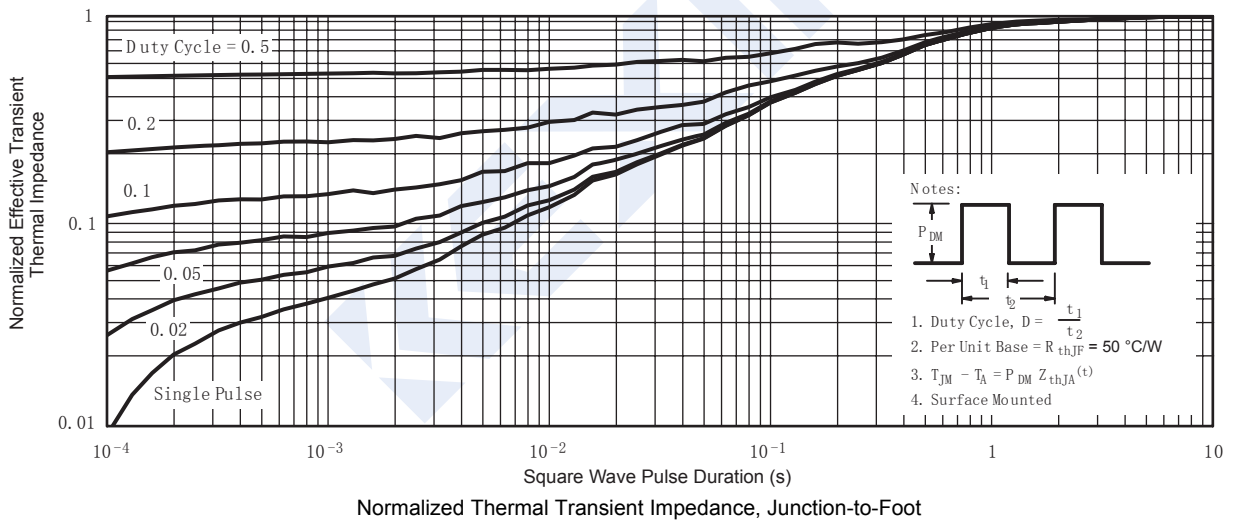
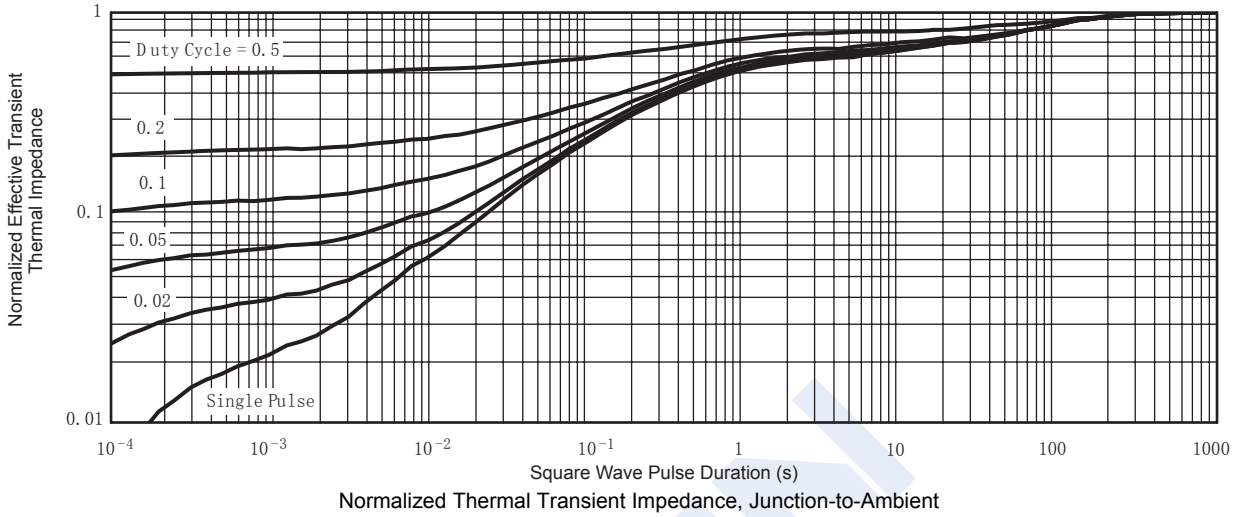
## P-Channel Enhancement MOSFET SI2333CDS (KI2333CDS)

■ Typical Characteristics



## P-Channel Enhancement MOSFET SI2333CDS (KI2333CDS)

■ Typical Characteristics



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