



## UK3919

Power MOSFET

### SWITCHING N-CHANNEL POWER MOSFET

#### DESCRIPTION

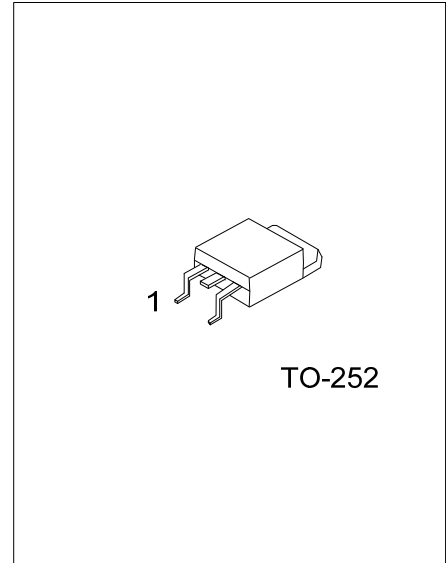
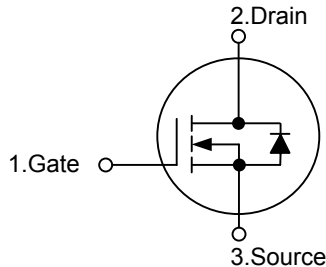
This **UK3919** N-Channel Logic Level MOSFET is produced using UTC Semiconductor advanced Power Trench process which has been tailored to make the on-state resistance minimum and yet maintain low gate charge for superior switching performance especially.

The **UK3919** is well suited for where low in-line power loss is needed in a very small outline surface mount package, such as low voltage and battery powered applications.

#### FEATURES

- \*  $R_{DS(ON)} = 5.6m\Omega @ V_{GS} = 10V$
- \* Low capacitance
- \* Optimized gate charge
- \* Fast switching capability
- \* Avalanche energy specified

#### SYMBOL



\*Pb-free plating product number:UK3919L

#### ORDERING INFORMATION

| Ordering Number |                   | Package | Pin Assignment |   |   | Packing   |
|-----------------|-------------------|---------|----------------|---|---|-----------|
| Normal          | Lead Free Plating |         | 1              | 2 | 3 |           |
| UK3919-TN3-R    | UK3919L-TN3-R     | TO-252  | G              | D | S | Tape Reel |
| UK3919-TN3-T    | UK3919L-TN3-T     | TO-252  | G              | D | S | Tube      |

|                                                                                           |  |                                                                                                      |
|-------------------------------------------------------------------------------------------|--|------------------------------------------------------------------------------------------------------|
| <p>UK3919L-TN3-R</p> <p>(1)Packing Type</p> <p>(2)Package Type</p> <p>(3)Lead Plating</p> |  | <p>(1) R: Tape Reel, T: Tube</p> <p>(2) TN3:TO-252</p> <p>(3) L: Lead Free Plating, Blank: Pb/Sn</p> |
|-------------------------------------------------------------------------------------------|--|------------------------------------------------------------------------------------------------------|

■ ABSOLUTE MAXIMUM RATINGS ( $T_C = 25^\circ\text{C}$ , unless otherwise specified)

| PARAMETER                        | SYMBOL    | RATINGS         | UNIT             |
|----------------------------------|-----------|-----------------|------------------|
| Drain to Source Voltage          | $V_{DS}$  | 25              | V                |
| Gate to Source Voltage           | $V_{GS}$  | $\pm 20$        | V                |
| Continuous Drain Current         | $I_D$     | $\pm 64$        | A                |
| Pulsed Drain Current (Note1)     | $I_{DM}$  | $\pm 256$       | A                |
| Single Avalanche Current (Note2) | $I_{AS}$  | 27              | A                |
| Single Avalanche Energy (Note2)  | $E_{AS}$  | 73              | mJ               |
| Total Power Dissipation          | $P_D$     | 36              | W                |
| Storage Temperature              | $T_{STG}$ | $-55 \sim +150$ | $^\circ\text{C}$ |

Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged.

Absolute maximum ratings are stress ratings only and functional device operation is not implied.

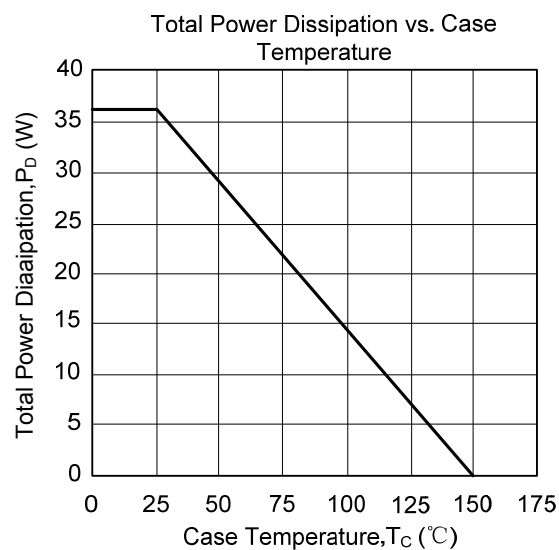
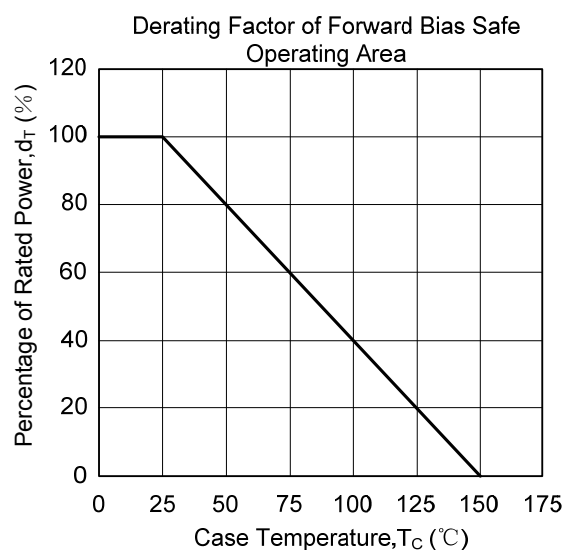
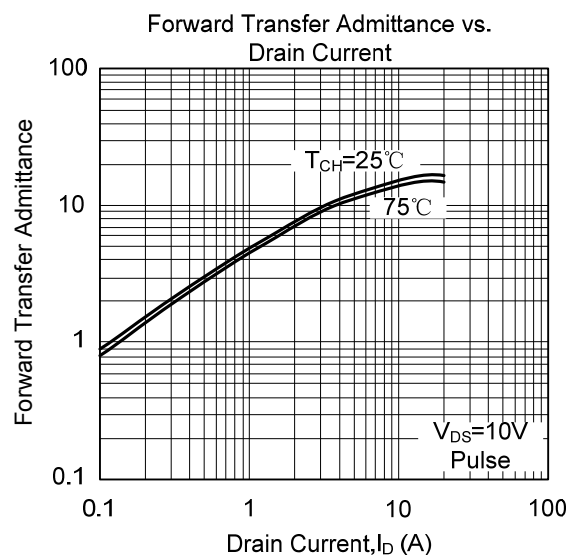
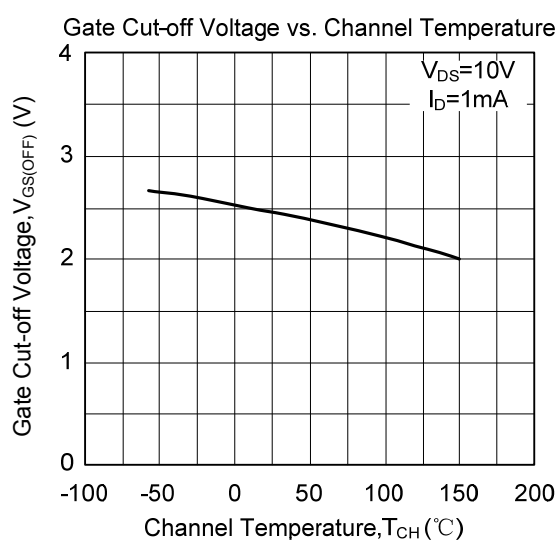
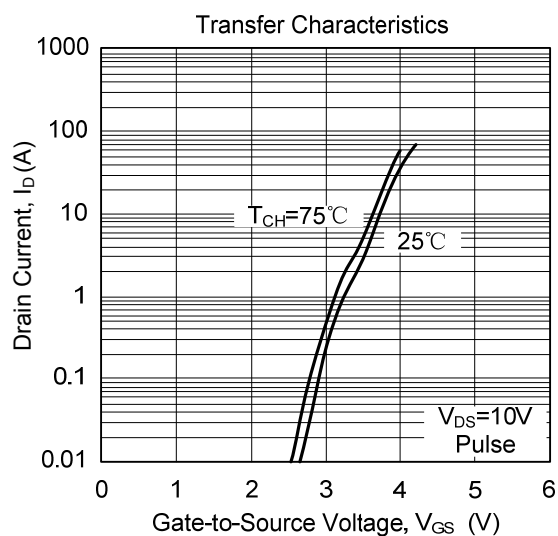
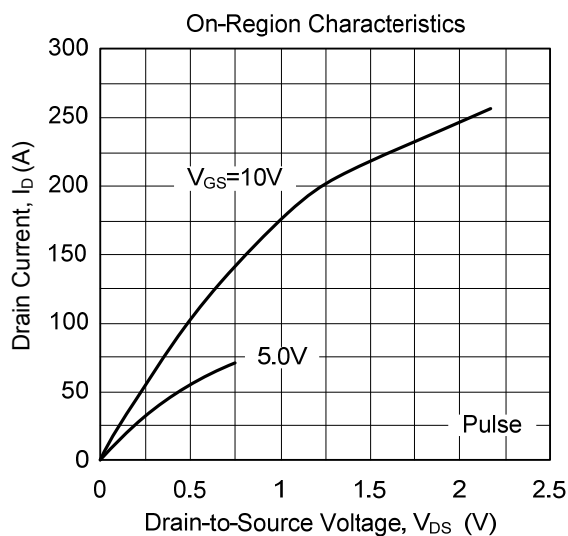
■ ELECTRICAL CHARACTERISTICS ( $T_C = 25^\circ\text{C}$ , unless otherwise specified)

| PARAMETER                                       | SYMBOL               | TEST CONDITIONS                                                                             | MIN | TYP  | MAX  | UNIT |
|-------------------------------------------------|----------------------|---------------------------------------------------------------------------------------------|-----|------|------|------|
| OFF CHARACTERISTICS                             |                      |                                                                                             |     |      |      |      |
| Zero Gate Voltage Drain Current                 | I <sub>DSS</sub>     | V <sub>DS</sub> =25 V, V <sub>GS</sub> =0 V                                                 |     |      | 10   | μA   |
| Gate-Body Leakage Current                       | I <sub>GSS</sub>     | V <sub>DS</sub> =0 V, V <sub>GS</sub> =±20V                                                 |     |      | ±100 | nA   |
| ON CHARACTERISTICS                              |                      |                                                                                             |     |      |      |      |
| Gate-Threshold Voltage                          | V <sub>GS(OFF)</sub> | V <sub>DS</sub> =10V, I <sub>D</sub> =1mA                                                   | 2.0 | 2.5  | 3.0  | V    |
| Drain-Source On-Resistance                      | R <sub>DS(ON)</sub>  | V <sub>GS</sub> =10 V, I <sub>D</sub> =32 A                                                 |     | 4.5  | 5.6  | mΩ   |
|                                                 |                      | V <sub>GS</sub> =5.0 V, I <sub>D</sub> =16 A                                                |     | 6.8  | 13.7 |      |
| DYNAMIC PARAMETERS                              |                      |                                                                                             |     |      |      |      |
| Input Capacitance                               | C <sub>ISS</sub>     | V <sub>DS</sub> =10V, V <sub>GS</sub> =0V, f=1MHz                                           |     | 2050 |      | pF   |
| Output Capacitance                              | C <sub>OSS</sub>     |                                                                                             |     | 460  |      |      |
| Reverse Transfer Capacitance                    | C <sub>RSS</sub>     |                                                                                             |     | 330  |      |      |
| SWITCHING PARAMETERS                            |                      |                                                                                             |     |      |      |      |
| Gate to Source Charge                           | Q <sub>G</sub>       | V <sub>DD</sub> =20V, V <sub>GS</sub> =10 V,I <sub>D</sub> =64 A                            |     | 42   |      | nC   |
| Gate Charge at Threshold                        | Q <sub>GS</sub>      |                                                                                             |     | 8    |      |      |
| Gate to Drain Charge                            | Q <sub>GD</sub>      |                                                                                             |     | 15   |      |      |
| Turn-ON Delay Time                              | t <sub>D(ON)</sub>   | V <sub>DD</sub> =12.5V, I <sub>D</sub> =32 A, V <sub>GS</sub> =10V,<br>R <sub>G</sub> =10 Ω |     | 16   |      | ns   |
| Turn-ON Rise Time                               | t <sub>R</sub>       |                                                                                             |     | 19   |      |      |
| Turn-OFF Delay Time                             | t <sub>D(OFF)</sub>  |                                                                                             |     | 53   |      |      |
| Turn-OFF Fall-Time                              | t <sub>F</sub>       |                                                                                             |     | 22   |      |      |
| SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS |                      |                                                                                             |     |      |      |      |
| Body Diode Forward Voltage                      | V <sub>SD</sub>      | I <sub>F</sub> =64 A, V <sub>GS</sub> =0 V                                                  |     | 0.97 |      | V    |
| Reverse Recovery Time                           | t <sub>RR</sub>      | I <sub>F</sub> = 64 A,V <sub>GS</sub> =0 V ,di/dt = 100 A/μs                                |     | 23   |      | ns   |
| Reverse Recovery Charge                         | Q <sub>RR</sub>      |                                                                                             |     | 11   |      | nC   |

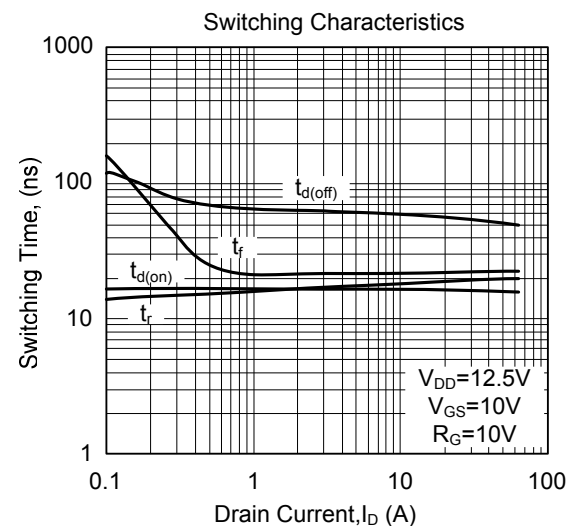
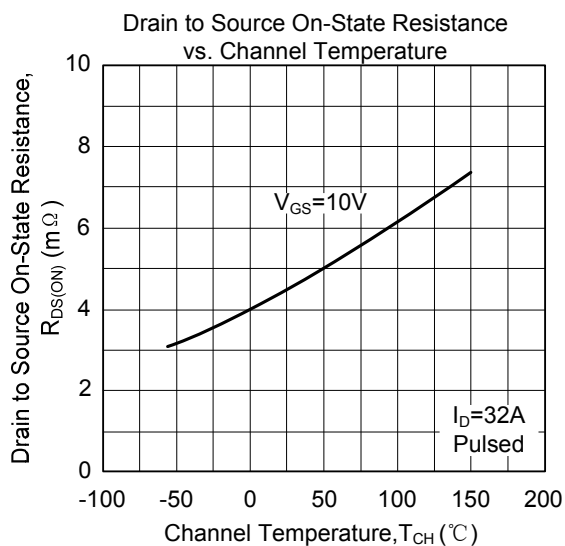
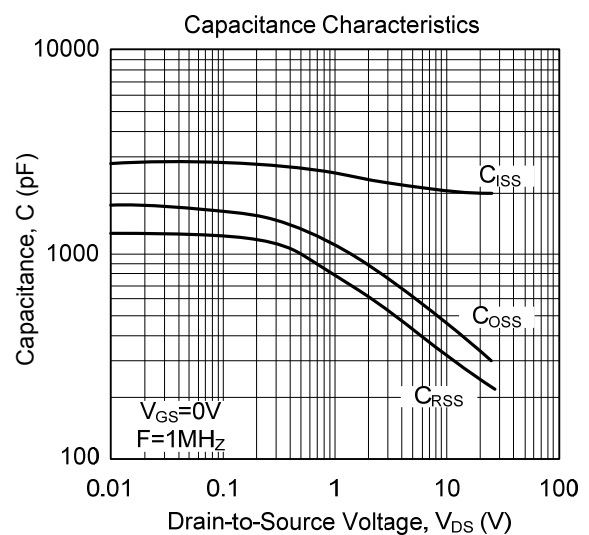
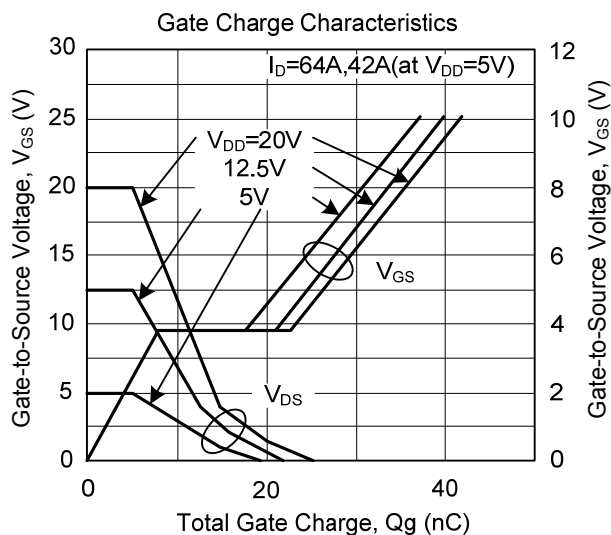
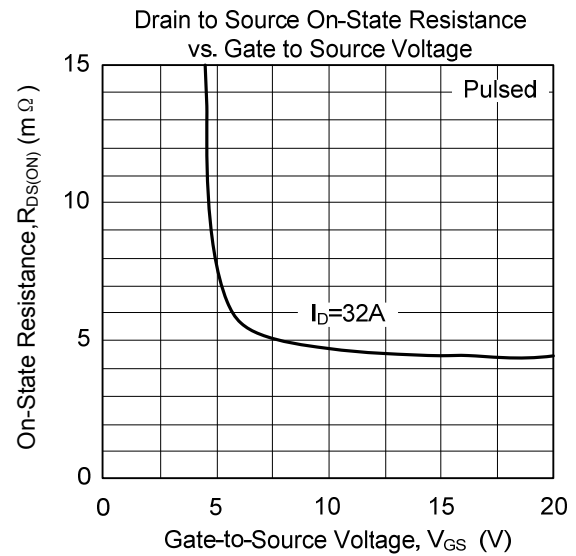
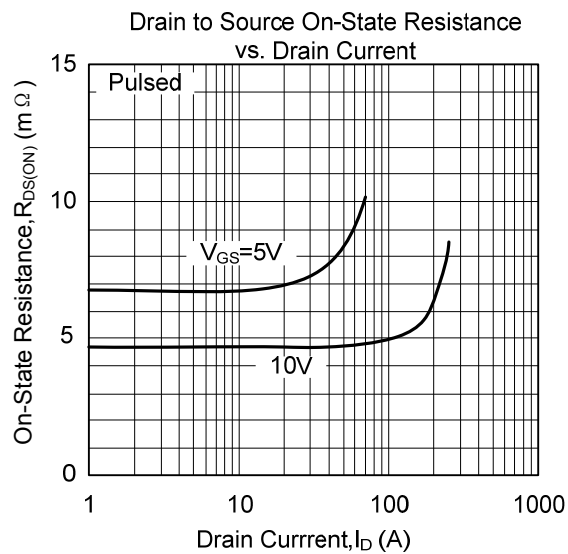
Notes: 1.  $PW \leq 10\text{ }\mu\text{s}$ , Duty Cycle  $\leq 1\%$

2. Starting  $T_{CH} = 25^\circ\text{C}$ ,  $V_{DD} = 12.5\text{ V}$ ,  $R_G = 25\text{ }\Omega$ ,  $V_{GS} = 20 \rightarrow 0\text{ V}$

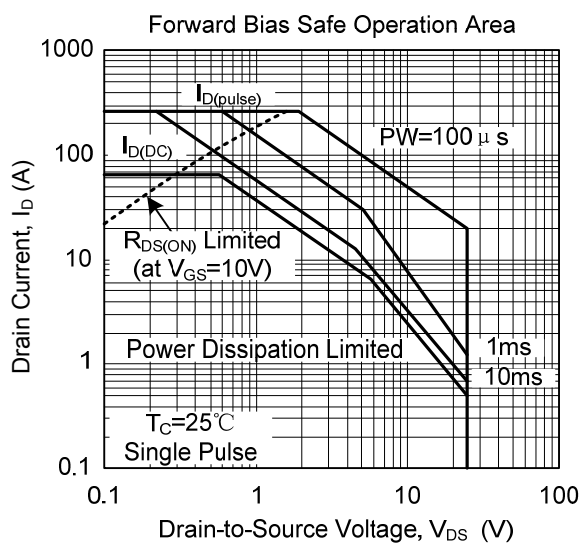
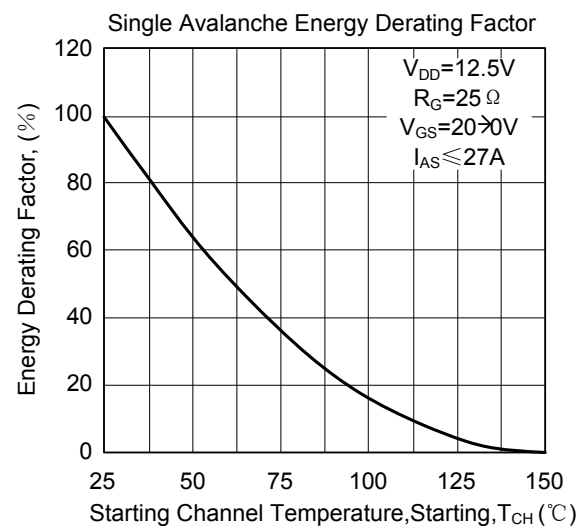
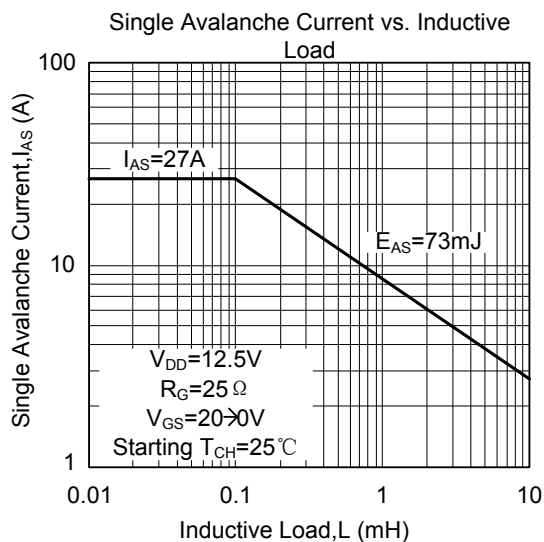
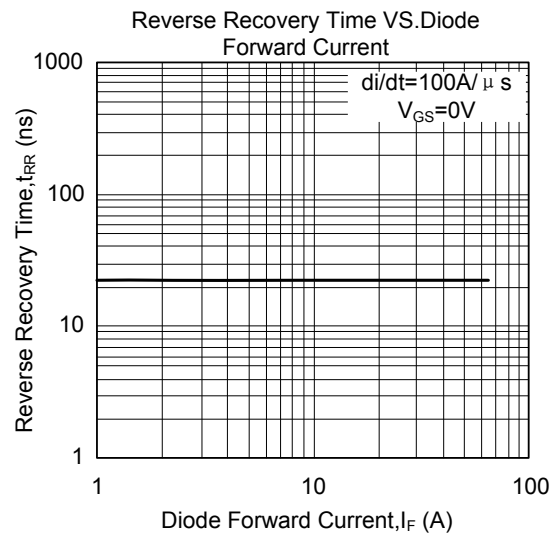
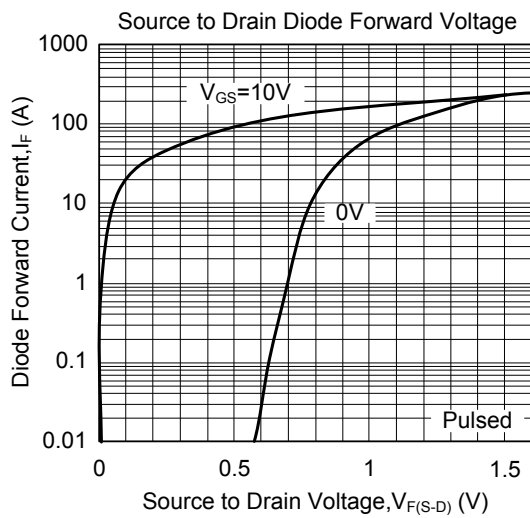
## TYPICAL CHARACTERISTICS



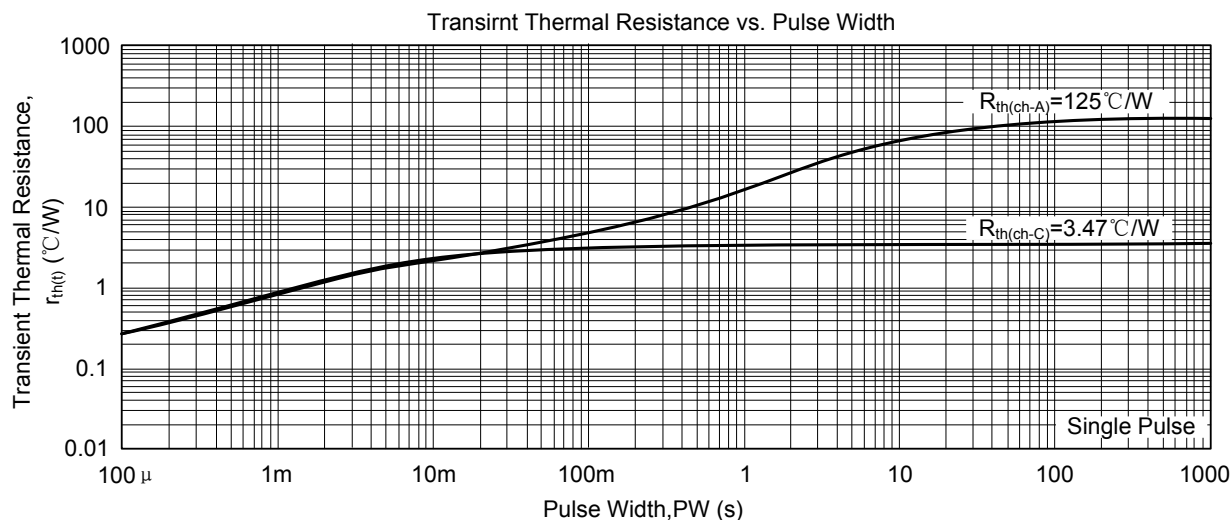
# ■ TYPICAL CHARACTERISTICS(Cont.)



## TYPICAL CHARACTERISTICS(Cont.)



■ TYPICAL CHARACTERISTICS(Cont.)



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