



UT100N03

Power MOSFET

100A, 30V N-CHANNEL POWER MOSFET

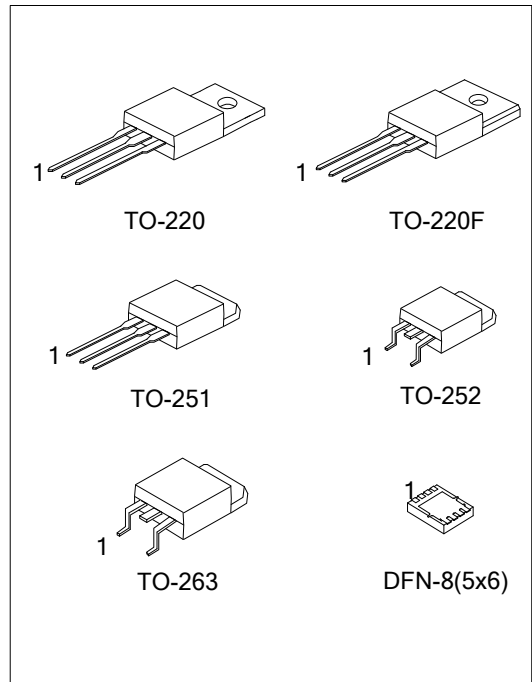
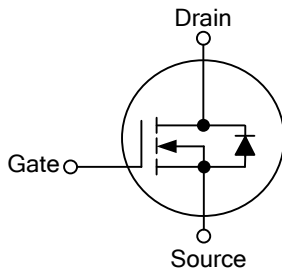
■ DESCRIPTION

The **UT100N03** uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with low gate voltages. This device is suitable for use as a load switch or in PWM applications.

■ FEATURES

- * $R_{DS(ON)} < 5.3m\Omega @ V_{GS}=10V, I_D=50A$
- * $R_{DS(ON)} < 8.0m\Omega @ V_{GS}=4.5V, I_D=40A$

■ SYMBOL



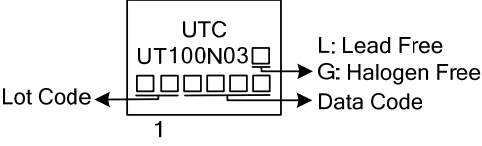
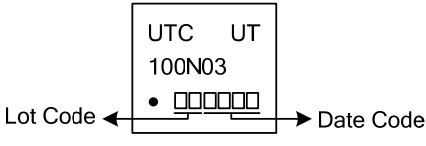
■ ORDERING INFORMATION

| Ordering Number | | Package | Pin Assignment | | | | | | | | Packing |
|-----------------|----------------------|------------|----------------|---|---|---|---|---|---|---|-----------|
| Lead Free | Halogen Free | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | |
| UT100N03L-TA3-T | UT100N03G-TA3-T | TO-220 | G | D | S | - | - | - | - | - | Tube |
| UT100N03L-TF3-T | UT100N03G-TF3-T | TO-220F | G | D | S | - | - | - | - | - | Tube |
| UT100N03L-TM3-T | UT100N03G-TM3-T | TO-251 | G | D | S | - | - | - | - | - | Tube |
| UT100N03L-TN3-R | UT100N03G-TN3-R | TO-252 | G | D | S | - | - | - | - | - | Tape Reel |
| UT100N03L-TND-R | UT100N03G-TND-R | TO-252D | G | D | S | - | - | - | - | - | Tape Reel |
| UT100N03L-TQ2-T | UT100N03G-TQ2-T | TO-263 | G | D | S | - | - | - | - | - | Tube |
| UT100N03L-TQ2-R | UT100N03G-TQ2-R | TO-263 | G | D | S | - | - | - | - | - | Tape Reel |
| - | UT100N03G-K08-5060-R | DFN-8(5x6) | S | S | S | G | D | D | D | D | Tape Reel |

Note: Pin Assignment: G: Gate D: Drain S: Source

| | |
|--|---|
| <p>UT100N03L-TA3-T</p> <p>(1)Packing Type</p> <p>(2)Package Type</p> <p>(3)Green Package</p> | <p>(1) T: Tube, R: Tape Reel</p> <p>(2) TA3: TO-220, TF3: TO-220F, TM3: TO-251, TN3: TO-252, TND: TO-252D, TQ2: TO-263, K08-5060: DFN-8(5x6)</p> <p>(3) L: Lead Free, G: Halogen Free and Lead Free</p> |
|--|---|

■ MARKING

| TO-251 / TO-252 / TO-252D / TO-263 | DFN-8(5×6) |
|---|--|
|  <p>UTC UT100N03 □□□□□ L: Lead Free G: Halogen Free Data Code Lot Code ← 1</p> |  <p>UTC UT 100N03 • □□□□□ Date Code Lot Code ←</p> |

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

| PARAMETER | | SYMBOL | RATINGS | UNIT |
|--|---------------|-----------|------------|------------------|
| Drain-Source Voltage | | V_{DSS} | 30 | V |
| Gate-Source Voltage | | V_{GSS} | ± 20 | V |
| Continuous Drain Current | | I_D | 100 | A |
| Pulsed Drain Current (Note 2) | | I_{DM} | 400 | A |
| Single Pulsed Avalanche Current (Note 3) | | I_{AS} | 35 | A |
| Single Pulsed Avalanche Energy (Note 3) | | E_{AS} | 875 | mJ |
| Power Dissipation | TO-220/TO-263 | P_D | 100 | W |
| | TO-220F | | 36 | |
| | TO-251/TO-252 | | 50 | |
| | TO-252D | | 21 | |
| | DFN-8(5x6) | | 21 | |
| Junction Temperature | | T_J | +175 | $^\circ\text{C}$ |
| Storage Temperature | | T_{STG} | -55 ~ +175 | $^\circ\text{C}$ |

Notes: 1. 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.

2. Pulse width limited by maximum junction temperature

3. $L = 0.5\text{mH}$, $I_{AS} = 35\text{A}$, $V_{DD} = 25\text{V}$, $R_G = 25\Omega$, Starting $T_J = 25^\circ\text{C}$.

■ THERMAL DATA

| PARAMETER | | SYMBOL | RATINGS | UNIT |
|---------------------|--------------------------|---------------|------------------|--------------------|
| Junction to Ambient | TO-220/TO-220F TO-263 | θ_{JA} | 62.5 | $^\circ\text{C/W}$ |
| | TO-251/TO-252 TO-252D | | 110 | |
| | DFN-8(5x6) | | 40.3 (Note 1, 2) | |
| | | | | |
| Junction to Case | TO-220/TO-263 | θ_{JC} | 1.5 | $^\circ\text{C/W}$ |
| | TO-220F | | 3.47 | |
| | TO-251/TO-252 TO-252D | | 3 | |
| | DFN-8(5x6) | | 6 (Note 1, 2) | |
| | | | | |

Notes: 1. Maximum under Steady State conditions is 90°C/W .

2. Surface Mounted on 1" x 1" FR4 board.

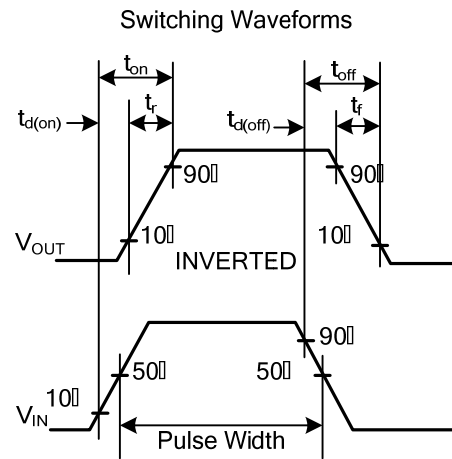
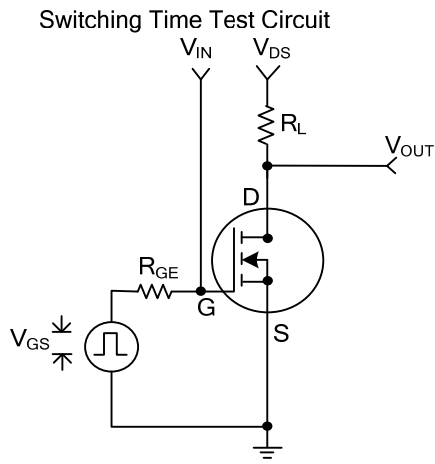
■ ELECTRICAL CHARACTERISTICS (T_J =25°C, unless otherwise noted)

| PARAMETER | SYMBOL | TEST CONDITIONS | MIN | TYP | MAX | UNIT |
|--|---------------------|---|-----|------|------|------|
| OFF CHARACTERISTICS | | | | | | |
| Drain-Source Breakdown Voltage | BV _{DSS} | V _{GS} =0 V, I _D =250 μA | 30 | | | V |
| Drain-Source Leakage Current | I _{DSS} | V _{DS} =30 V, V _{GS} =0 V | | | 1 | μA |
| Gate-Source Leakage Current | I _{GSS} | V _{DS} =0 V, V _{GS} = ±20 V | | | ±100 | nA |
| ON CHARACTERISTICS (Note2) | | | | | | |
| Gate Threshold Voltage | V _{GS(TH)} | V _{DS} =V _{GS} , I _D =250 μA | 1 | | 3 | V |
| Static Drain-Source On-Resistance | R _{DS(ON)} | V _{GS} =10 V, I _D =50 A | | 3.05 | 5.3 | mΩ |
| | | V _{GS} =4.5 V, I _D =40 A | | 4.2 | 8 | |
| DYNAMIC PARAMETERS (Note3) | | | | | | |
| Input Capacitance | C _{ISS} | V _{DS} =15V, V _{GS} =0V, f=1.0MHz | | 9500 | | pF |
| Output Capacitance | C _{OSS} | | | 800 | | |
| Reverse Transfer Capacitance | C _{RSS} | | | 300 | | |
| SWITCHING PARAMETERS (Note3) | | | | | | |
| Total Gate Charge | Q _G | V _{DS} =15V, V _{GS} =5V, I _D =16A | | 50 | 65 | nC |
| Gate Source Charge | Q _{GS} | | | 20.8 | | |
| Gate Drain Charge | Q _{GD} | | | 19 | | |
| Turn-ON Delay Time | t _{D(ON)} | V _{DD} =15V, I _D =1A, R _{GEN} =6Ω V _{GS} =10 V | | 25.7 | 50 | ns |
| Turn-ON Rise Time | t _R | | | 10 | 20 | |
| Turn-OFF Delay Time | t _{D(OFF)} | | | 128 | 200 | |
| Turn-OFF Fall-Time | t _F | | | 34 | 70 | |
| SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS | | | | | | |
| Drain-Source Diode Forward Voltage | V _{SD} | I _S =20 A, V _{GS} =0 V | | | 1.5 | V |
| Drain-Source Diode Forward Current | I _S | | | | 90 | A |

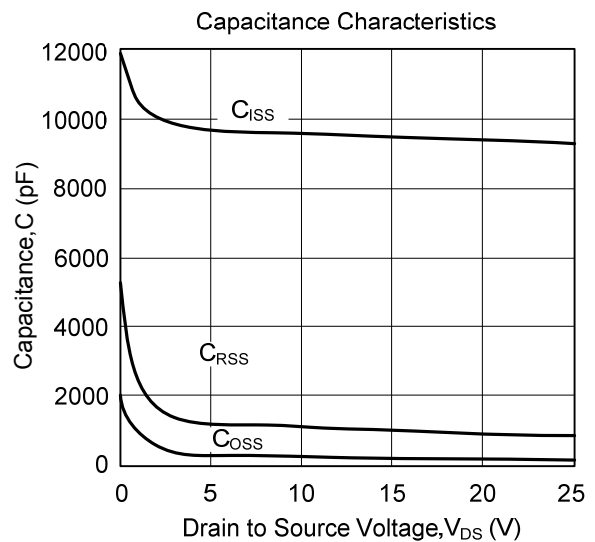
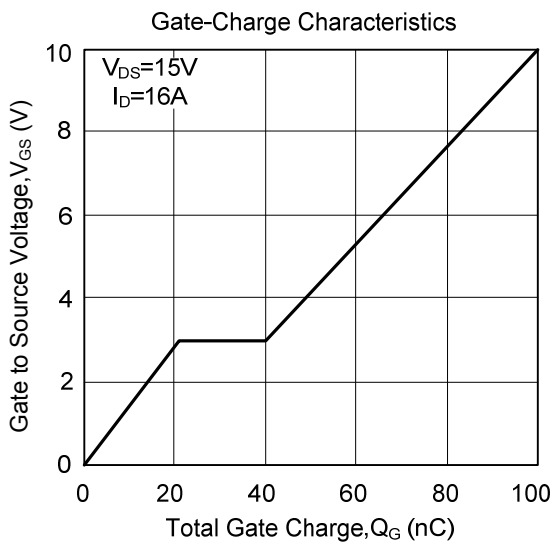
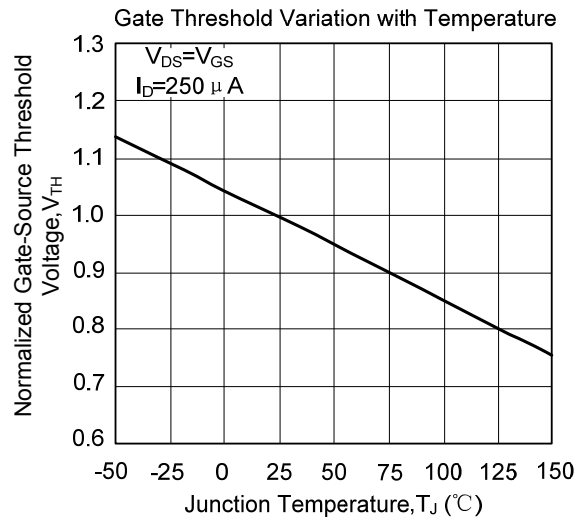
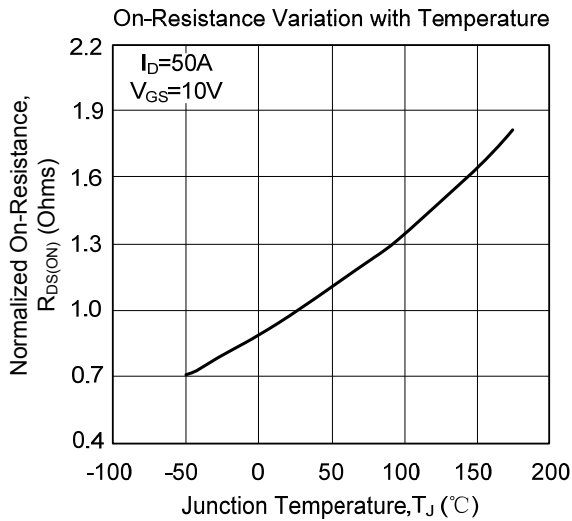
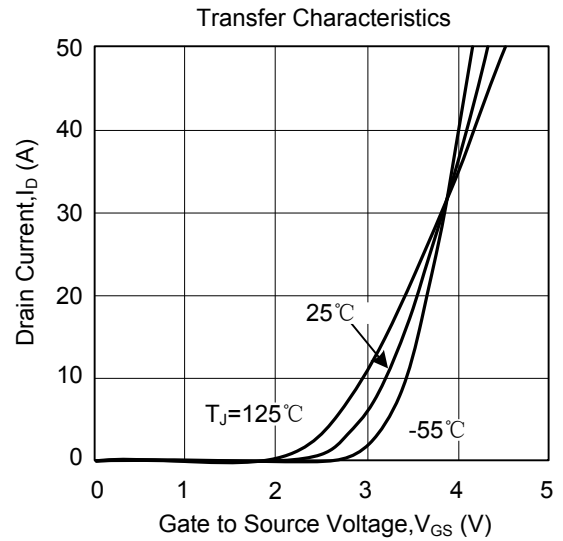
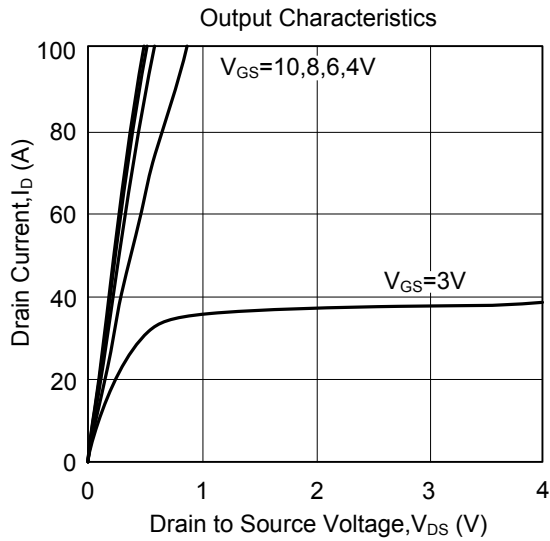
Notes: 1. Pulse Test : Pulse Width < 300μs, Duty Cycle < 2%.

2. Guaranteed by design, not subject to production testing.

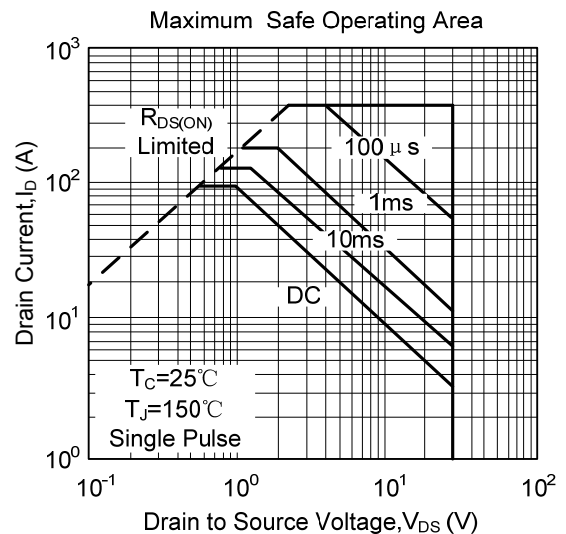
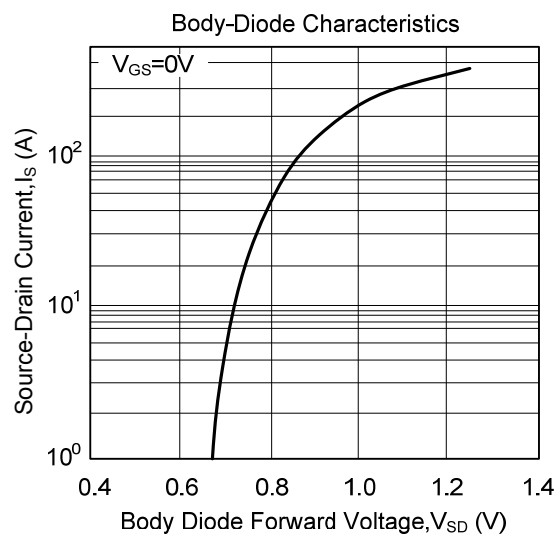
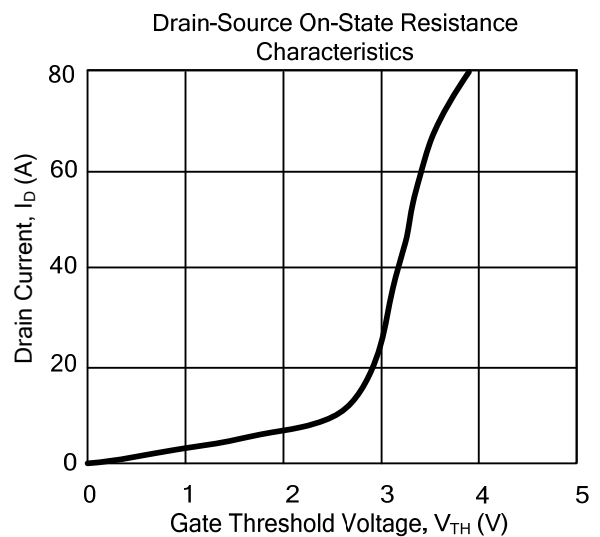
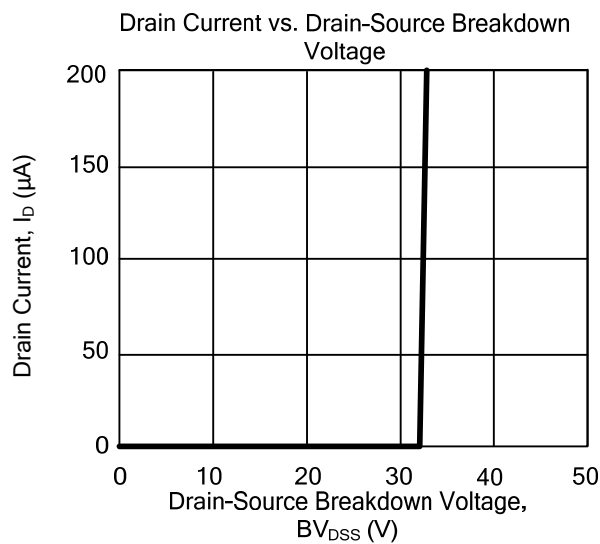
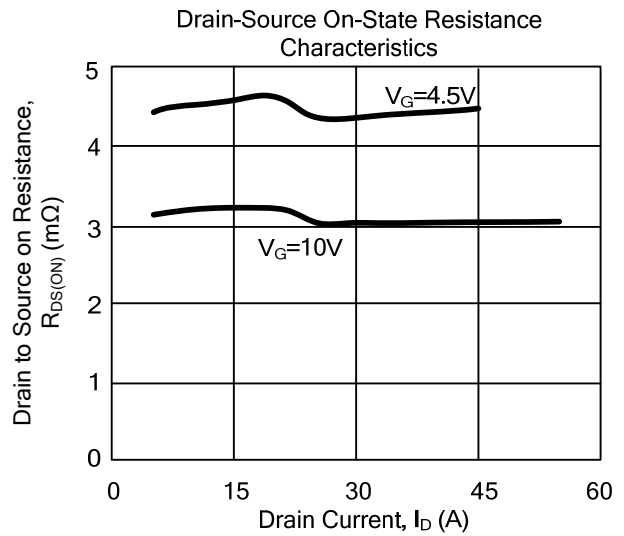
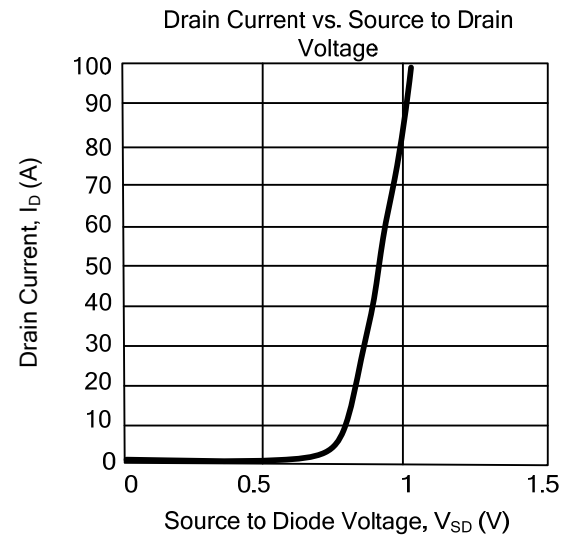
■ TEST CIRCUIT AND WAVEFORM



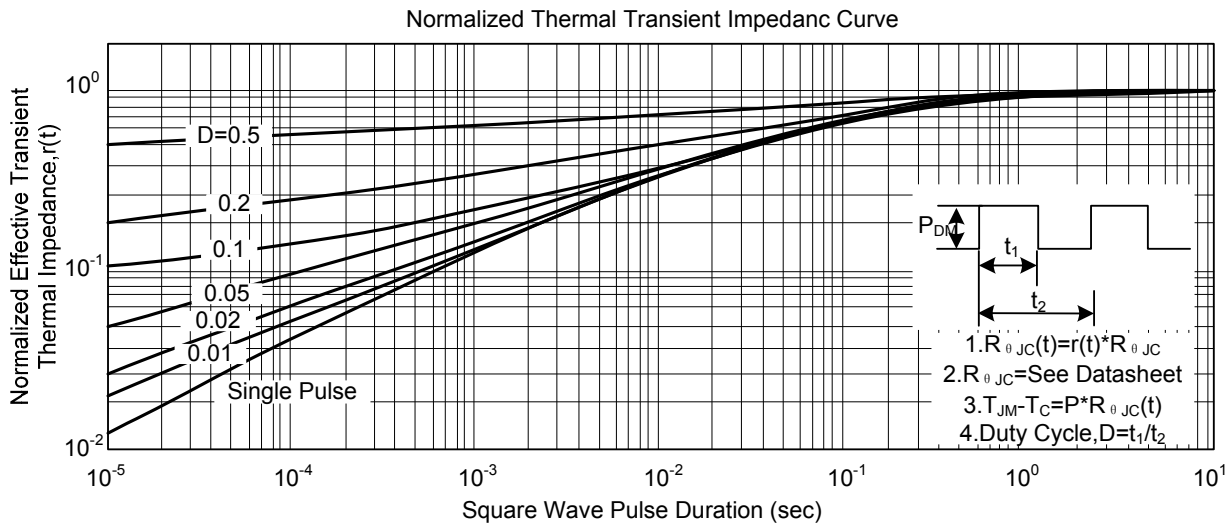
TYPICAL CHARACTERISTICS



■ TYPICAL CHARACTERISTICS(Cont.)



■ TYPICAL CHARACTERISTICS(Cont.)



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