

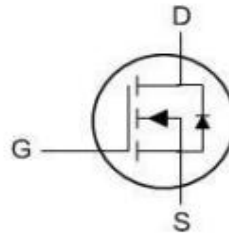
## Features

The TWS100N85EF is the high cell density trench N-ch MOSFETs, which provide excellent RDSON and gate charge for most of the synchronous buck converter applications.

The TWS100N85EF meet the RoHS and Green Product requirement, 100% EAS guaranteed with full function reliability approved.

## Product Summary

| BVDSS | RDSON | ID   |
|-------|-------|------|
| 85V   | 4.3mΩ | 100A |



PDFN5X6

## Maximum Ratings(Ta=25°C unless otherwise noted)

| Parameter                                  | Symbol      | Value      | Unit |
|--------------------------------------------|-------------|------------|------|
| Drain-Source Voltage                       | VDS         | 85         | V    |
| Gate-Source Voltage                        | VGS         | ±20        |      |
| Continuous Drain Current                   | ID@TC =25°C | 100        | A    |
| Continuous Drain Current                   | ID@TC=100°C | 63.3       |      |
| Pulsed Drain Current ①                     | IDM         | 350        |      |
| Single Pulse Avalanche Energy <sup>3</sup> | EAS         | 273.8      | mJ   |
| Power Dissipation ②                        | PD@TC=25°C  | 107.8      | W    |
| Storage Temperature                        | TSTG        | -55 to 150 | °C   |
| Operating Junction                         | TJ          | -55 to 150 |      |

## Thermal Data

| Parameter                                   | Symbol | Typ. | Max. | Unit |
|---------------------------------------------|--------|------|------|------|
| Thermal Resistance from Junction-to-Ambient | RθJA   |      | 60   | °C/W |
| Thermal Resistance Junction-Case            | RθJC   |      | 1.16 | °C/W |

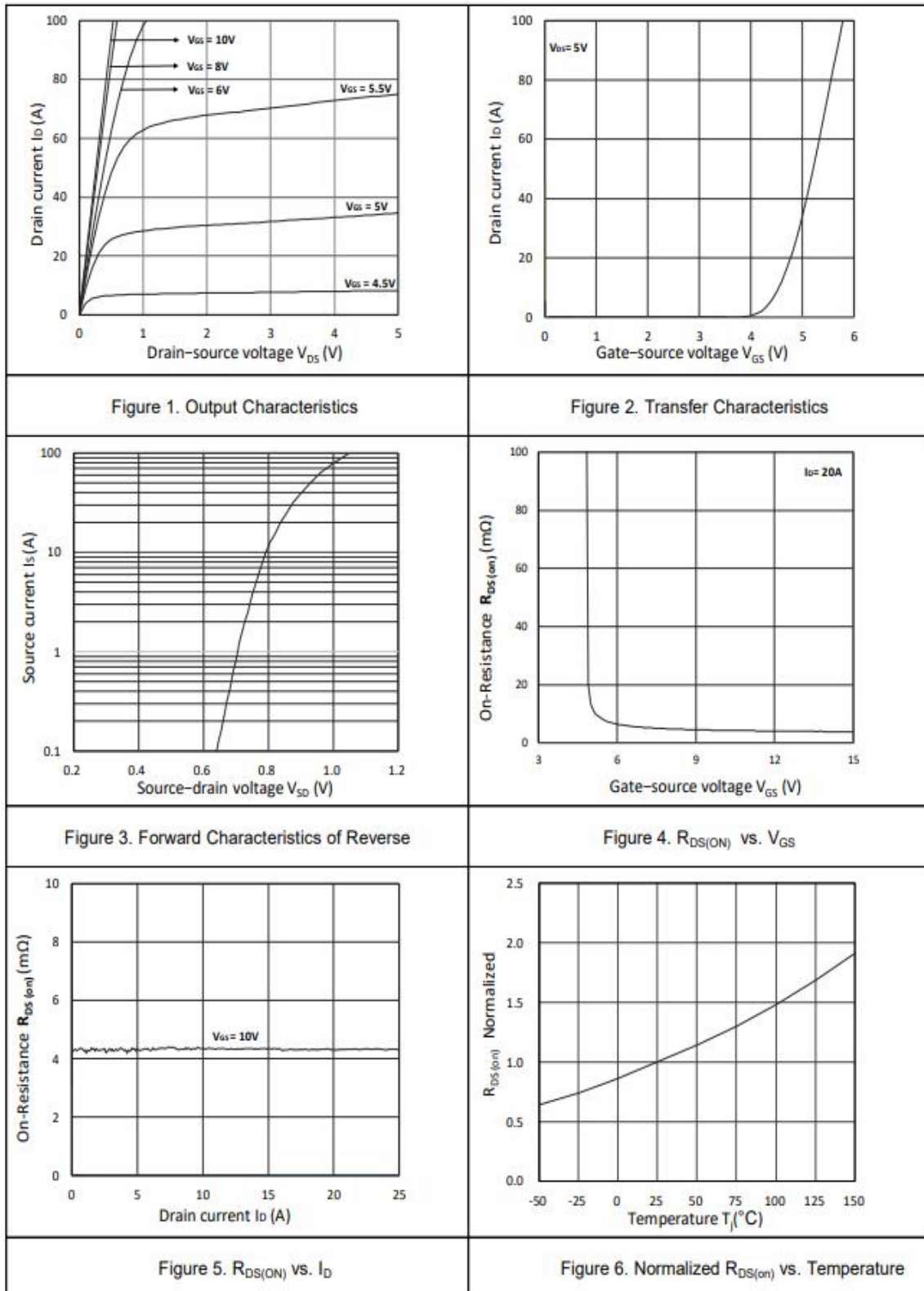
**Electrical Characteristics(TJ=25°C unless otherwise noted)**

| Parameter                                                | Symbol  | Test Condition                        | Min | Typ  | Max  | Unit |
|----------------------------------------------------------|---------|---------------------------------------|-----|------|------|------|
| Static Parameters                                        |         |                                       |     |      |      |      |
| Drain-Source Breakdown Voltage                           | BVDSS   | VGS = 0V, ID = 250μA                  | 85  |      |      | V    |
| Zero Gate Voltage Drain Current                          | IDSS    | VDS = 85V, VGS =0V                    |     |      | 1    | μA   |
| Gate-Body leakage Current                                | IGSS    | VDS =0V, VGS = ±20V                   |     |      | ±100 | nA   |
| Gate Threshold Voltage                                   | VGS(th) | VDS =VGS, ID = 250μA                  | 2   | 3    | 4    | V    |
| Static Drain-Source On-Resistance                        | RDS(on) | VGS = 10V, ID = 20A                   |     | 4.3  | 5.6  | mΩ   |
| Dynamic Parameters                                       |         |                                       |     |      |      |      |
| Input Capacitance                                        | Ciss    | VDS = 40V, VGS =0V, f =1MHz           |     | 4645 |      | pF   |
| Output Capacitance                                       | Coss    |                                       |     | 673  |      | pF   |
| Reverse Transfer Capacitance                             | Crss    |                                       |     | 41   |      | pF   |
| Total Gate Charge                                        | Qg      | VGS = 10V, VDS = 40V, ID= 20A         |     | 61.3 |      | nC   |
| Gate Source Charge                                       | Qgs     |                                       |     | 21   |      | nC   |
| Gate Drain Charge                                        | Qgd     |                                       |     | 11   |      | nC   |
| Switching Parameters                                     |         |                                       |     |      |      |      |
| Turn-On DelayTime                                        | td(on)  | VGS =10V, VDD = 40V, RG = 3Ω, ID= 20A |     | 16.5 |      | ns   |
| Turn-On Rise Time                                        | tr      |                                       |     | 51.8 |      | ns   |
| Turn-Off DelayTime                                       | td(off) |                                       |     | 37.1 |      | ns   |
| Turn-Off Fall Time                                       | tf      |                                       |     | 8.2  |      | ns   |
| Drain-Source Diode Characteristics and Maximum Ratings   |         |                                       |     |      |      |      |
| Maximum Continuous Drain to Source Diode Forward Current |         | IS                                    |     |      | 100  | A    |
| Drain to Source Diode Forward Voltage                    | VSD     | IS = 20A, VGS = 0V                    |     |      | 1.2  | V    |
| Body Diode Reverse Recovery Time                         | trr     | IF=20A, di/dt = 100A/μS               |     | 69   |      | ns   |
| Body Diode Reverse Recovery Charge                       | Qrr     |                                       |     | 141  |      | nC   |

**Note :**

1. Repetitive Rating : Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, t < 10 sec.
3. Pulse Test : Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
4. Guaranteed by design, not subject to production testing.

## Typical Electrical and Thermal Characteristics



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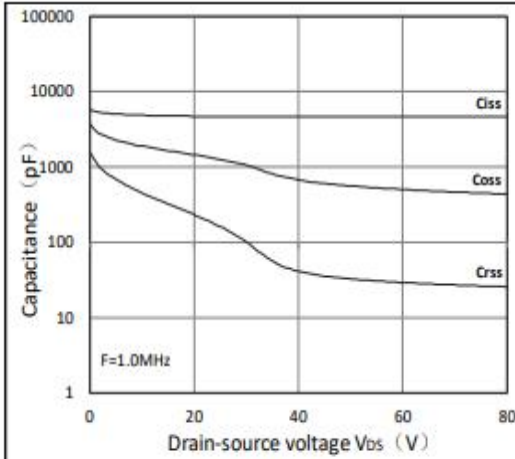


Figure 7. Capacitance Characteristics

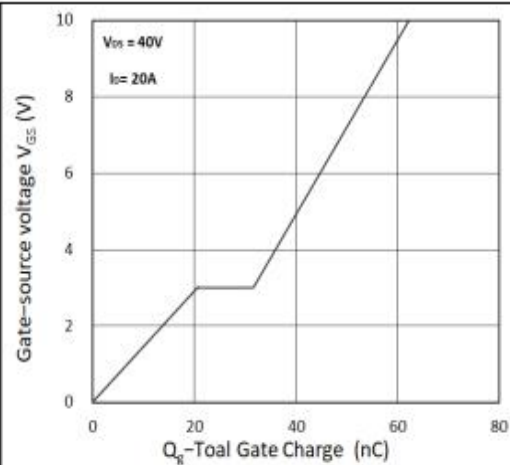


Figure 8. Gate Charge Characteristics

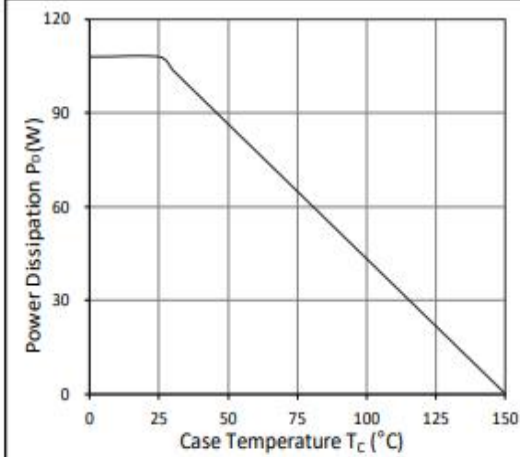


Figure 9. Power Dissipation

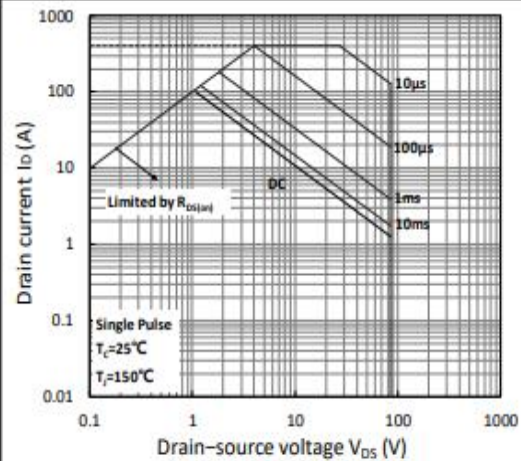


Figure 10. Safe Operating Area

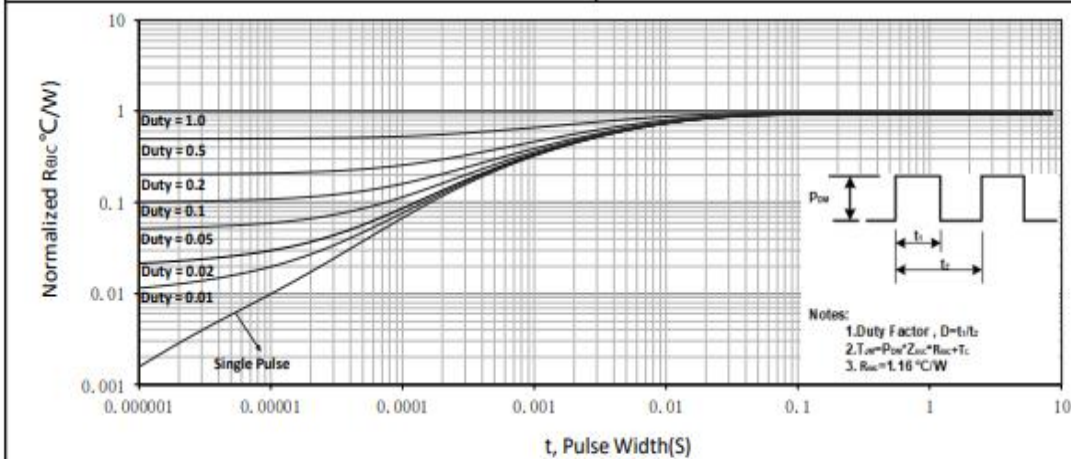
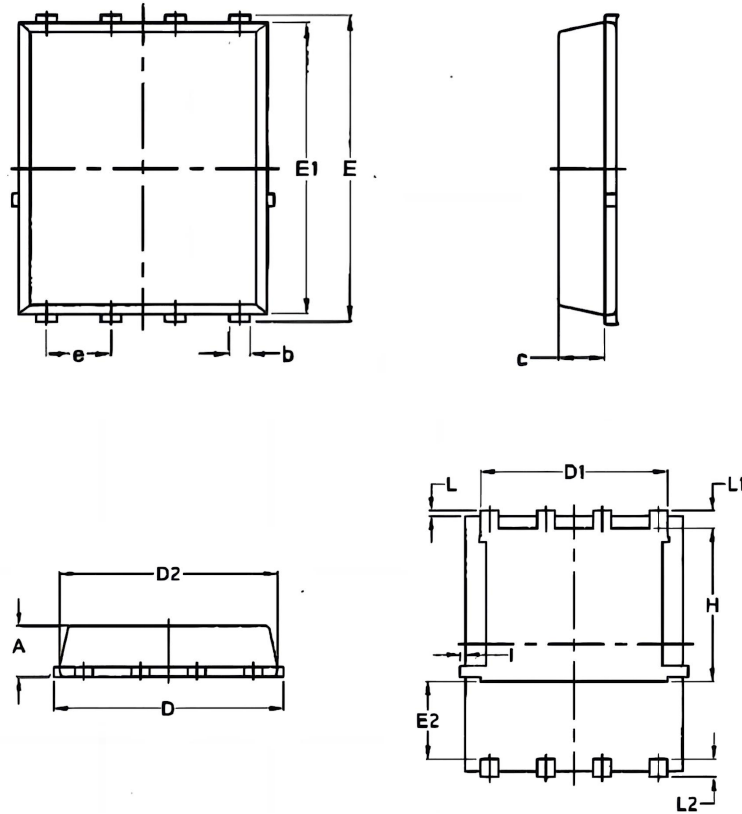


Figure 11. Normalized Maximum Transient Thermal Impedance

# PDFN5X6 Package Outline Dimesions



| Symbol | Dimensions In Millimeters |        | Dimensions In Inches |        |
|--------|---------------------------|--------|----------------------|--------|
|        | Min                       | Max    | Min                  | Max    |
| A      | 1.03                      | 1.17   | 0.0406               | 0.0461 |
| b      | 0.34                      | 0.48   | 0.0134               | 0.0189 |
| c      | 0.824                     | 0.0970 | 0.0324               | 0.082  |
| D      | 4.80                      | 5.40   | 0.1890               | 0.2126 |
| D1     | 4.11                      | 4.31   | 0.1618               | 0.1697 |
| D2     | 4.80                      | 5.00   | 0.1890               | 0.1969 |
| E      | 5.95                      | 6.15   | 0.2343               | 0.2421 |
| E1     | 5.65                      | 5.85   | 0.2224               | 0.2303 |
| E2     | 1.60                      | /      | 0.0630               | /      |
| e      | 1.27 BSC                  |        | 0.05 BSC             |        |
| L      | 0.05                      | 0.25   | 0.0020               | 0.0098 |
| L1     | 0.38                      | 0.50   | 0.0150               | 0.0197 |
| L2     | 0.38                      | 0.50   | 0.0150               | 0.0197 |
| H      | 3.30                      | 3.50   | 0.1299               | 0.1378 |
| I      | /                         | 0.18   | /                    | 0.0070 |