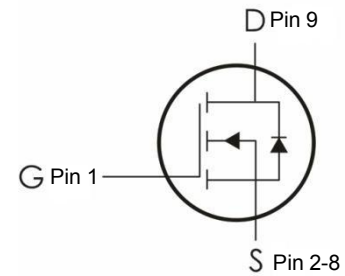
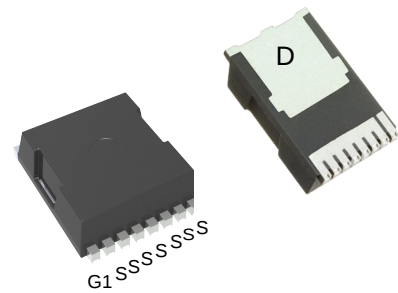


## Description:

This N-Channel MOSFET uses advanced SGT technology and design to provide excellent  $R_{DS(on)}$  with low gate charge. It can be used in a wide variety of applications.

## Features:

- 1)  $V_{DS}=120V, I_D=275A, R_{DS(on)} < 3.2m\Omega @ V_{GS}=10V$
- 2) Low gate charge.
- 3) Green device available.
- 4) Advanced high cell density trench technology for ultra low  $R_{DS(on)}$ .
- 5) Excellent package for good heat dissipation.



## Package Marking and Ordering Information:

| Part NO.   | Marking | Package | Packing       |
|------------|---------|---------|---------------|
| DOL270N12T | 270N12T | TOLLA-8 | 2000 pcs/Reel |

## Absolute Maximum Ratings: ( $T_C=25^\circ\text{C}$ unless otherwise noted)

| Symbol         | Parameter                                         | Ratings  | Units            |
|----------------|---------------------------------------------------|----------|------------------|
| $V_{DS}$       | Drain-Source Voltage                              | 120      | V                |
| $V_{GS}$       | Gate-Source Voltage                               | $\pm 20$ | V                |
| $I_D$          | Continuous Drain Current                          | 275      | A                |
|                | Continuous Drain Current- $T_C=100^\circ\text{C}$ | 160      |                  |
| $I_{DM}$       | Pulsed Drain Current                              | 1100     |                  |
| $P_D$          | Power Dissipation                                 | 365      | W                |
| $E_{AS}$       | Single pulse avalanche energy <sup>2</sup>        | 540      | mJ               |
| $T_J, T_{STG}$ | Operating and Storage Junction Temperature Range  | -55-+150 | $^\circ\text{C}$ |

## Thermal Characteristics:

| Symbol          | Parameter                                            | Max  | Units                     |
|-----------------|------------------------------------------------------|------|---------------------------|
| $R_{\theta JC}$ | Thermal Resistance, Junction to Case                 | 0.34 | $^\circ\text{C}/\text{W}$ |
| $R_{\theta JA}$ | Thermal Resistance, Junction to Ambient <sup>3</sup> | 58   | $^\circ\text{C}/\text{W}$ |

## Electrical Characteristics: ( $T_C=25^{\circ}\text{C}$ unless otherwise noted)

| Symbol                                 | Parameter                               | Conditions                                                                                | Min | Typ  | Max   | Units |
|----------------------------------------|-----------------------------------------|-------------------------------------------------------------------------------------------|-----|------|-------|-------|
| Off Characteristics                    |                                         |                                                                                           |     |      |       |       |
| BV <sub>DSS</sub>                      | Drain-Sourctce Breakdown Voltage        | V <sub>GS</sub> =0V, I <sub>D</sub> =250 μ A                                              | 120 | ---  | ---   | V     |
| I <sub>DSS</sub>                       | Zero Gate Voltage Drain Current         | V <sub>GS</sub> =0V, V <sub>DS</sub> =120V                                                | --- | ---  | 1     | μ A   |
| I <sub>GSS</sub>                       | Gate-Source Leakage Current             | V <sub>GS</sub> =± 20V, V <sub>DS</sub> =0A                                               | --- | ---  | ± 100 | nA    |
| On Characteristics                     |                                         |                                                                                           |     |      |       |       |
| V <sub>GS(th)</sub>                    | Gate-Source Threshold Voltage           | V <sub>GS</sub> =V <sub>DS</sub> , I <sub>D</sub> =250 μ A                                | 2   | 3    | 4     | V     |
| R <sub>DS(ON)</sub>                    | Drain-Source On Resistance <sup>4</sup> | V <sub>GS</sub> =10V, I <sub>D</sub> =20A                                                 | --- | 2.6  | 3.2   | m Ω   |
| Dynamic Characteristics <sup>5</sup>   |                                         |                                                                                           |     |      |       |       |
| C <sub>iss</sub>                       | Input Capacitance                       | V <sub>DS</sub> =60V, V <sub>GS</sub> =0V, f=1MHz                                         | --- | 9500 | ---   | pF    |
| C <sub>oss</sub>                       | Output Capacitance                      |                                                                                           | --- | 1400 | --    |       |
| C <sub>rss</sub>                       | Reverse Transfer Capacitance            |                                                                                           | --- | 46   | ---   |       |
| Switching Characteristics <sup>5</sup> |                                         |                                                                                           |     |      |       |       |
| t <sub>d(on)</sub>                     | Turn-On Delay Time                      | V <sub>DS</sub> =60V, I <sub>D</sub> =20A,<br>R <sub>ENG</sub> =3 Ω ,V <sub>GS</sub> =10V | --- | 33   | ---   | ns    |
| t <sub>r</sub>                         | Rise Time                               |                                                                                           | --- | 90   | ---   | ns    |
| t <sub>d(off)</sub>                    | Turn-Off Delay Time                     |                                                                                           | --- | 94   | ---   | ns    |
| t <sub>f</sub>                         | Fall Time                               |                                                                                           | --- | 56   | ---   | ns    |
| Q <sub>g</sub>                         | Total Gate Charge                       | V <sub>GS</sub> =10V, V <sub>DS</sub> =60V,<br>I <sub>D</sub> =20A                        | --- | 176  | ---   | nc    |
| Q <sub>gs</sub>                        | Gate-Source Charge                      |                                                                                           | --- | 44   | ---   | nc    |
| Q <sub>gd</sub>                        | Gate-Drain “Miller” Charge              |                                                                                           | --- | 42   | ---   | nc    |
| Drain-Source Diode Characteristics     |                                         |                                                                                           |     |      |       |       |
| V <sub>SD</sub>                        | Diode Forward Voltage                   | V <sub>GS</sub> =0V, I <sub>SD</sub> =20A                                                 | --- | ---  | 1.2   | V     |
| I <sub>S</sub>                         | Continuous Drain Curren                 | V <sub>D</sub> =V <sub>G</sub> =0V                                                        | --- | ---  | 275   | A     |
| I <sub>SM</sub>                        | Pulsed Drain Current                    |                                                                                           | --- | ---  | 1100  | A     |
| T <sub>rr</sub>                        | Reverse Recovery Time                   | I <sub>F</sub> =20A,                                                                      | --- | 100  | ---   | ns    |
| Q <sub>rr</sub>                        | Reverse Recovery Charge                 | dI/dt=100A/us                                                                             | --- | 189  | ---   | nc    |

## Notes:

1. Repetitive rating, pulse width limited by junction temperature  $T_{J(MAX)}=150^{\circ}\text{C}$ .
2. The EAS data shows Max. rating . The test condition is  $V_{DD}=50\text{V}$ ,  $V_{GS}=10\text{V}$ ,  $L=0.4\text{mH}$ ,  $I_{AS}=51\text{A}$ .
3. The data tested by surface mounted on a 1 inch<sup>2</sup> FR-4 board with 2OZ copper, The value in any given application depends on the user's specific board design.
4. The data tested by pulsed , pulse width  $\leq 300\mu\text{s}$  , duty cycle  $\leq 2\%$ .
5. This value is guaranteed by design hence it is not included in the production test.

## Typical Characteristics: ( $T_c=25^{\circ}\text{C}$ unless otherwise noted)

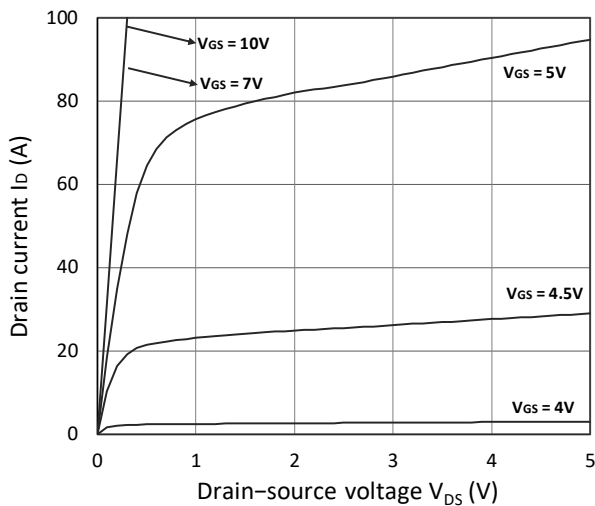


Figure 1. Output Characteristics

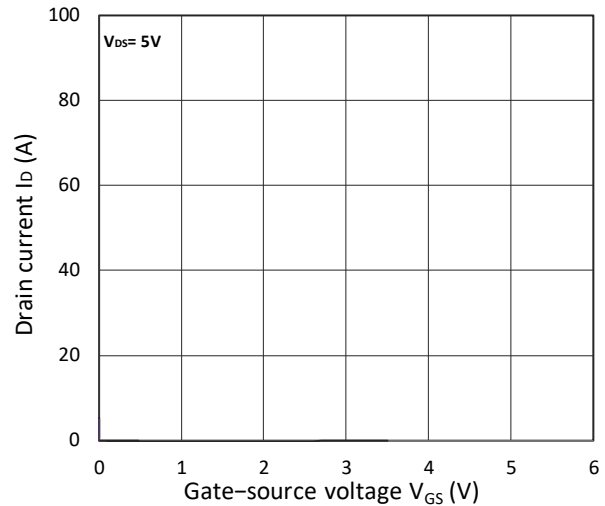


Figure 2. Transfer Characteristics

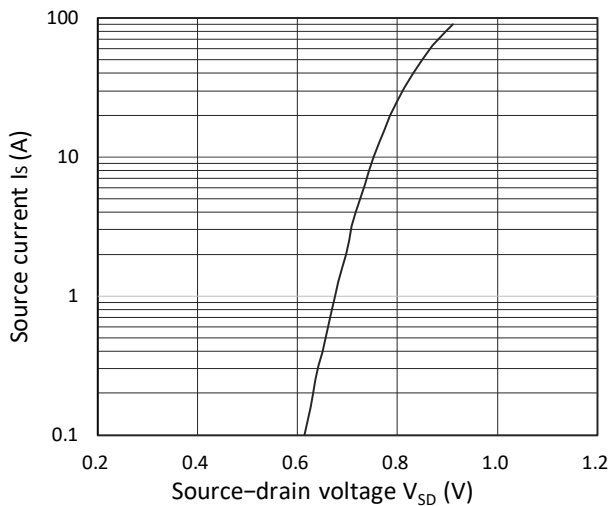


Figure 3. Forward Characteristics of Reverse

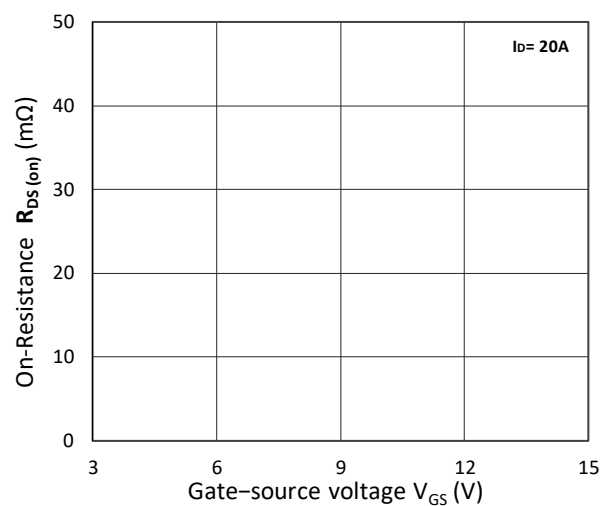


Figure 4.  $R_{DS(ON)}$  vs.  $V_{GS}$

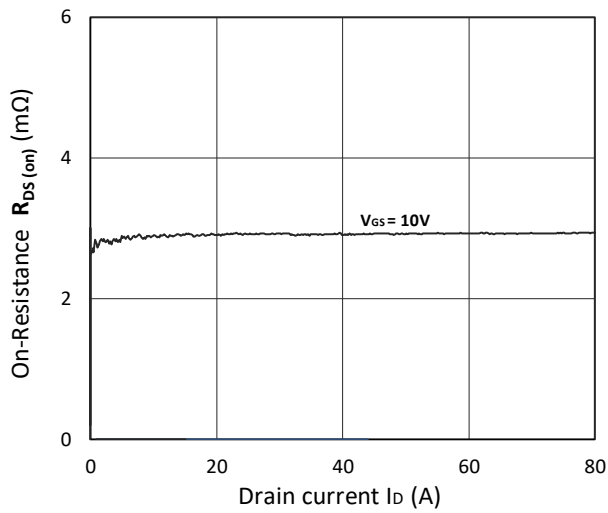


Figure 5.  $R_{DS(on)}$  vs.  $I_D$

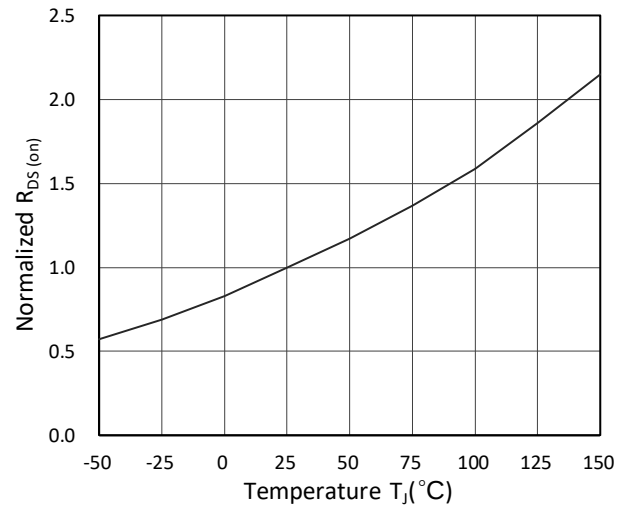


Figure 6. Normalized  $R_{DS(on)}$  vs. Temperature

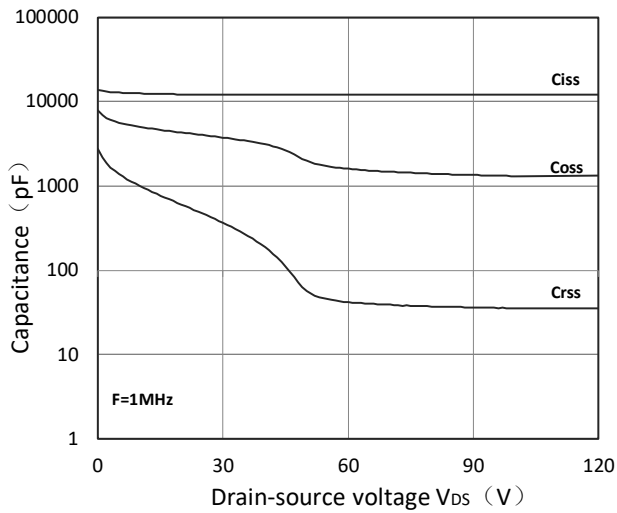


Figure 7. Capacitance Characteristics

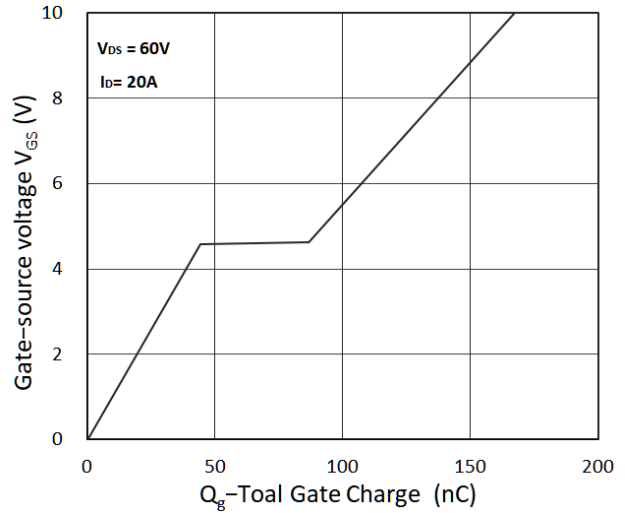


Figure 8. Gate Charge Characteristics

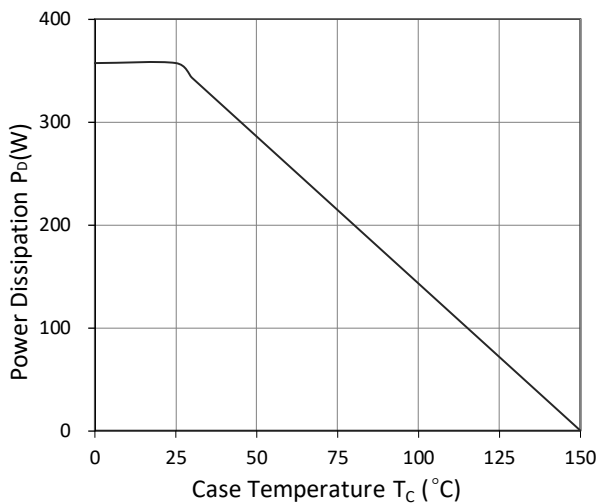


Figure 9. Power Dissipation

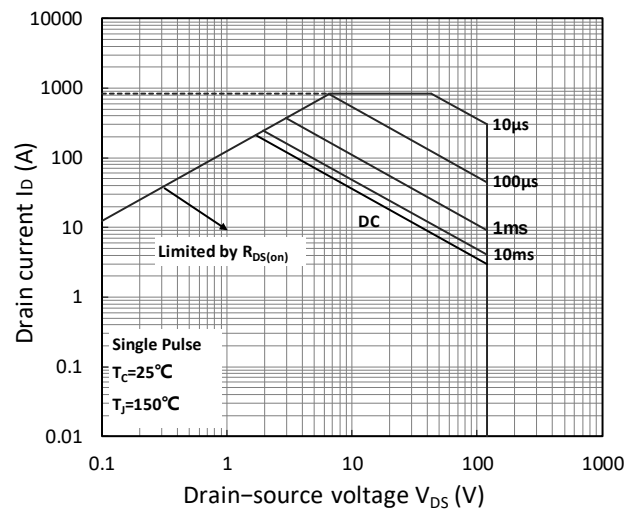


Figure10. Safe Operating Area

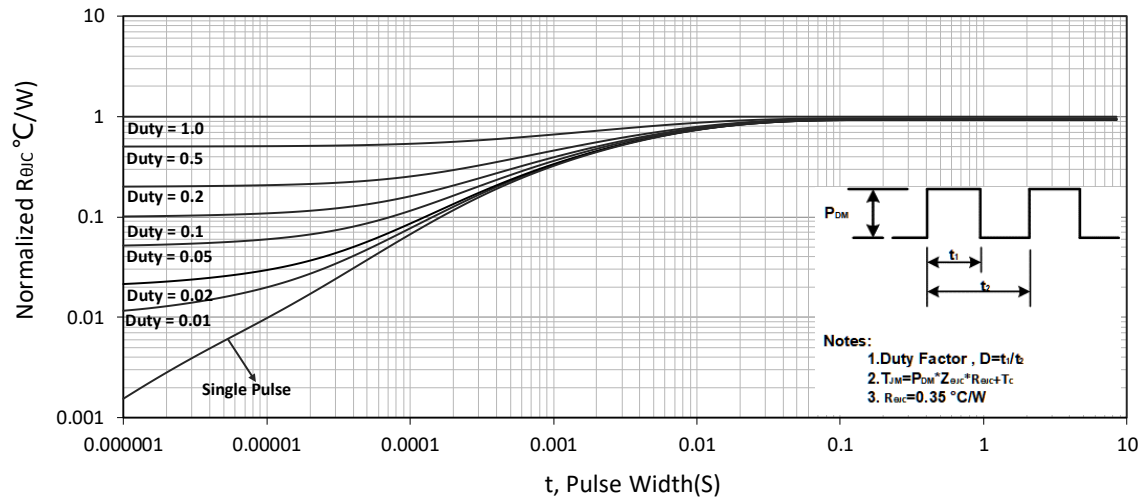


Figure 11. Normalized Maximum Transient Thermal Impedance

Technical drawing of a mechanical part showing three views: front, side, and top. The front view shows a rectangular block with a central circular hole, dimensions 10.10 x 11.88, and a central hole diameter of 9.70. The side view shows a profile with a 10°/4° chamfer and a height of 2.40. The top view shows a rectangular block with a central circular hole, dimensions 8.30 x 7.15, and a central hole diameter of 7.90. The drawing includes various dimension lines and tolerances.

## Package Information:

①. Doingter LOGO

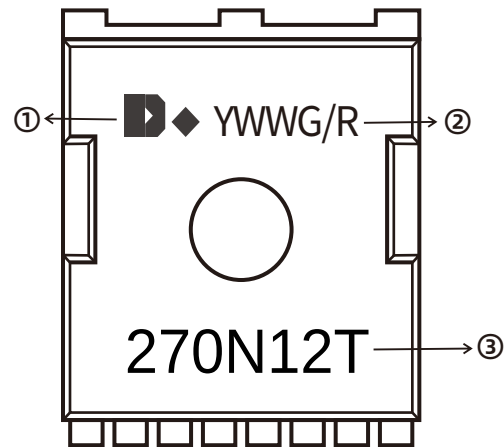
②. Date Code(YWWG / R)

Y : Year Code , last digit of the year

WW : Week Code(01-53)

G/R : G(Green) /R(Lead Free)

③. Part NO.



## Previous Version

| Version | Date       | Subjects (major changes since last revision) |
|---------|------------|----------------------------------------------|
| 1.0     | 2024-07-25 | Release of final version                     |

## Attention :

- Information furnished in this document is believed to be accurate and reliable. However, Shenzhen Doingter Semiconductor Co.,Ltd. assumes no responsibility for the consequences of use without consideration for such information nor use beyond it.
- Information mentioned in this document is subject to change without notice, apart from that when an agreement is signed, Shenzhen Doingter complies with the agreement. Products and information provided in this document have no infringement of patents.
- Shenzhen Doingter assumes no responsibility for any infringement of other rights of third parties which may result from the use of such products and information. This document supersedes and replaces all information previously supplied.



Is

a registered trademark of Shenzhen Doingter Semiconductor Co., Ltd. Copyright © 2013

Shenzhen Doingter Semiconductor Co.,Ltd. Printed All rights reserved.