

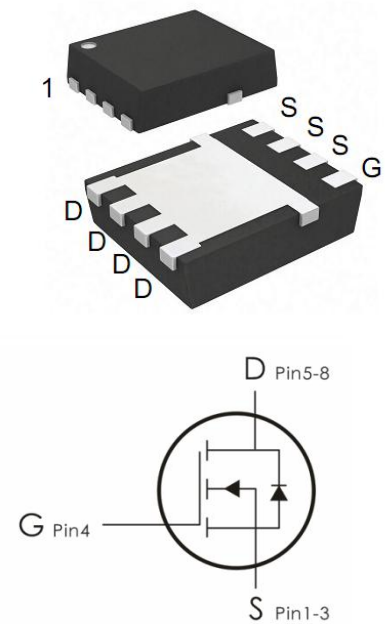
Description:

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) $V_{DS}=100V, I_D=30A, R_{DS(on)} < 20\text{ m}\Omega @ V_{GS}=10V$ (Typ : $16\text{ m}\Omega$)
- 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.



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

Symbol	Parameter	Ratings	Units
V_{DS}	Drain-Source Voltage	100	V
V_{GS}	Gate-Source Voltage	± 20	V
I_D	Continuous Drain Current ¹⁾	30	A
$I_{D, pulse}$	Pulsed Drain Current ²⁾	120	
I_S	Continuous diode forward current ¹⁾	30	A
$I_{S, Pulse}$	Diode pulsed current ²⁾	120	A
E_{AS}	Single Pulse Avalanche Energy ⁵⁾	57	mJ
P_D	Power Dissipation ³⁾	71	W
T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55 to +150	$^\circ\text{C}$

Thermal Characteristics:

Symbol	Parameter	Max	Units
$R_{\theta JC}$	Thermal Resistance, Junction to Case	1.76	$^\circ\text{C}/\text{W}$
$R_{\theta JA}$	Thermal Resistance Junction to mbient ⁴⁾	62	$^\circ\text{C}/\text{W}$

Package Marking and Ordering Information:

Part NO.	Marking	Package
DON30N10T	30N10T	DFN5*6-8

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

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Off Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250 μ A	100	---	---	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{GS} =0V, V _{DS} =100V	---	---	1	μ A
I _{GSS}	Gate-Source Leakage Current	V _{GS} =± 20V, V _{DS} =0A	---	---	± 100	nA
On Characteristics						
V _{GS(th)}	GATE-Source Threshold Voltage	V _{GS} =V _{DS} , I _D =250 μ A	1.4	---	2.5	V
R _{DS(ON)}	Drain-Source On Resistance	V _{GS} =10V, I _D =10A	---	16	20	m Ω
		V _{GS} =4.5V, I _D =7A	---	17.4	26	
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} =50V, V _{GS} =0V, f=1MHz	---	1000	---	pF
C _{oss}	Output Capacitance		---	180	---	
C _{rss}	Reverse Transfer Capacitance		---	9.5	---	
Switching Characteristics						
t _{d(on)}	Turn-On Delay Time	V _{DS} =50V, I _D =5A, R _G =10Ω, V _{GS} =10V	---	16.6	---	ns
t _r	Rise Time		---	3.8	---	ns
t _{d(off)}	Turn-Off Delay Time		---	75.5	---	ns
t _f	Fall Time		---	46	---	ns
Q _g	Total Gate Charge	V _{GS} =10V, V _{DS} =50V, I _D =5A	---	16.2	---	nC
Q _{gs}	Gate-Source Charge		---	2.8	---	nC
Q _{gd}	Gate-Drain “Miller” Charge		---	4.1	---	nC
V _{plateau}	Gate plateau voltage		---	3	---	V

Drain-Source Diode Characteristics						
Symbol	Parameter	Conditions	Min	Typ	Max	Units
V_{SD}	Source-Drain Diode Forward Voltage	$V_{GS}=0V, I_S=12A$	---	---	1.3	V
I_{rrm}	Peak reverse recovery current	$V_R=50V, I_S=5A,$ $di/dt=100A/us$	---	2.4	---	A
Q_{rr}	Reverse Recovery Charge		---	61.8	---	nC
T_{rr}	Reverse Recovery Time		---	49	---	ns

Notes:

- 1) Calculated continuous current based on maximum allowable junction temperature.
- 2) Repetitive rating; pulse width limited by max. junction temperature.
- 3) P_d is based on max. junction temperature, using junction-case thermal resistance.
- 4) The value of $R_{\theta JA}$ is measured with the device mounted on 1 in 2 FR-4 board with 2oz. Copper, in a still air environment with $T_a=25^\circ C$.
- 5) $V_{DD}=50V, V_{GS}=10V, L=0.3mH$, starting $T_j=25^\circ C$.

Typical Characteristics: ($T_C=25^\circ C$ unless otherwise noted)

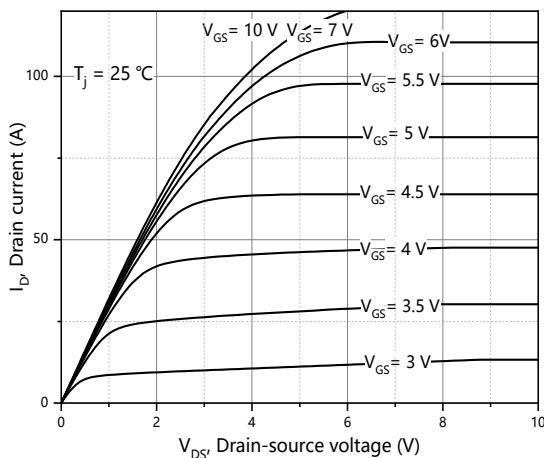


Figure 1. Typ. output characteristics

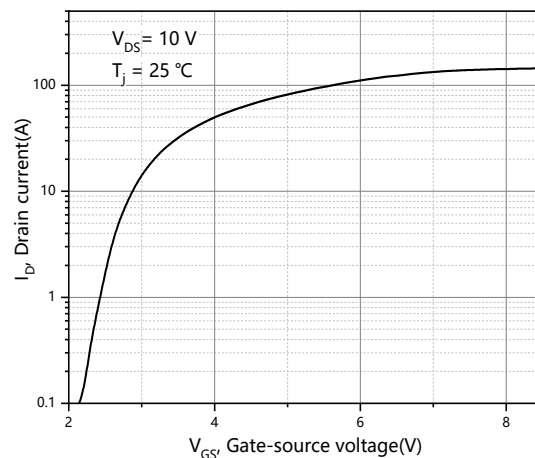


Figure 2. Typ. transfer characteristics

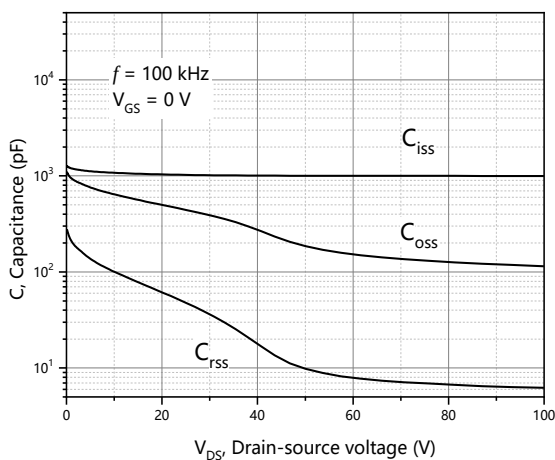


Figure 3. Typ. capacitances

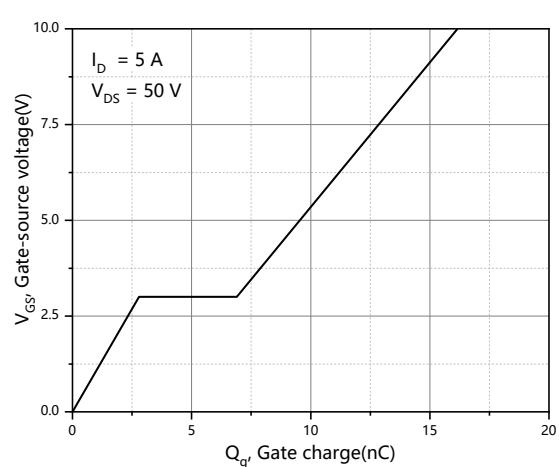


Figure 4. Typ. gate charge

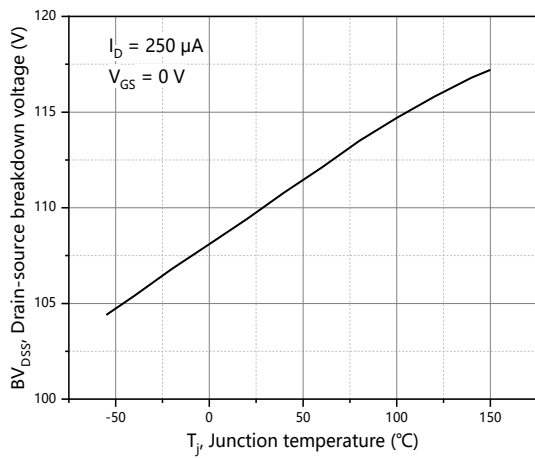


Figure 5. Drain-source breakdown voltage

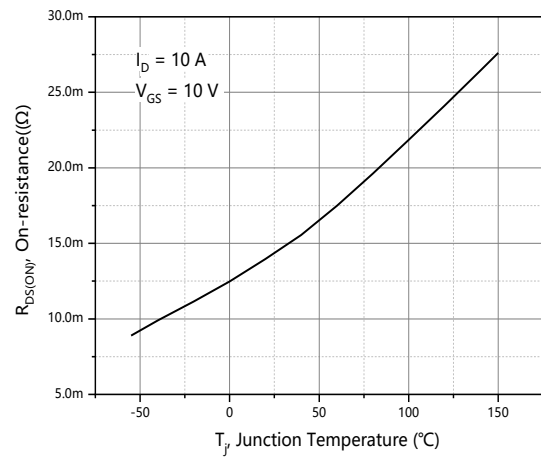


Figure 6. Drain-source on-state resistance

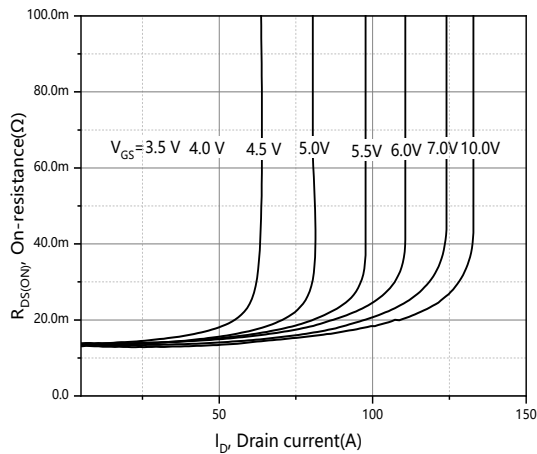


Figure 7. Drain-source on-state resistance

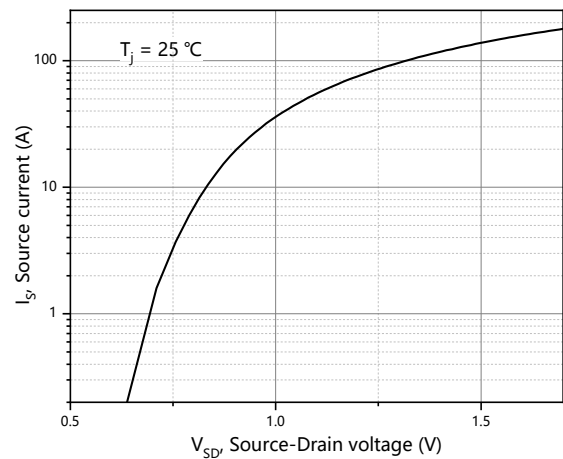


Figure 8. Forward characteristic of body diode

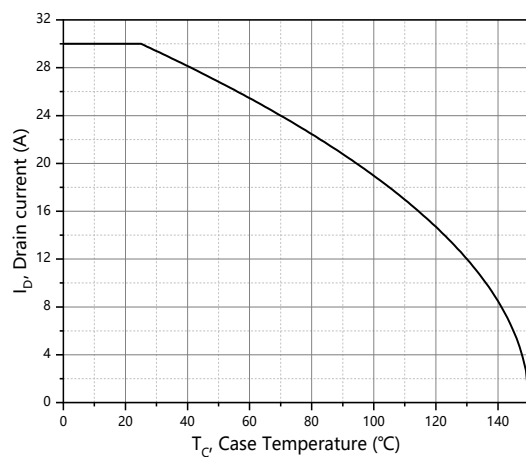


Figure 9. Drain current

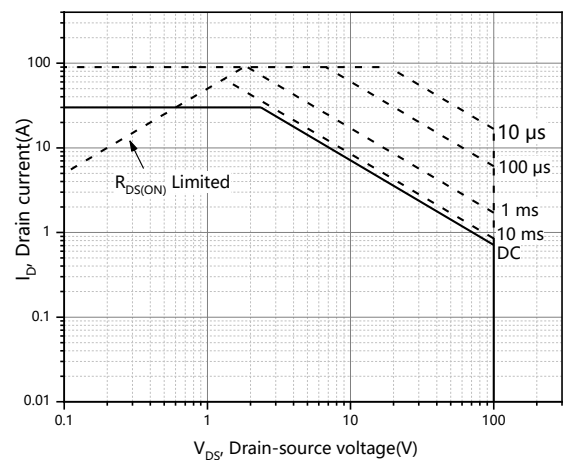


Figure 10. Safe operation area $T_C=25\text{ }^{\circ}\text{C}$