

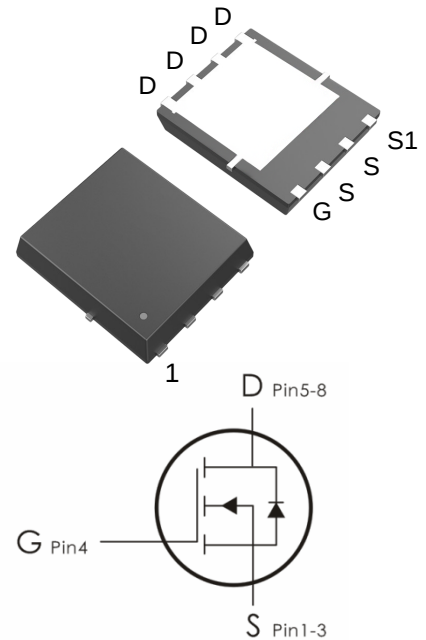
Description:

This N-Channel MOSFET uses advanced trench 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) $V_{DS}=20V, I_D=180A, R_{DS(on)} < 2m\Omega, @V_{GS}=4.5V$
- 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: ($T_C=25^\circ C$ unless otherwise noted)

Symbol	Parameter	Ratings	Units
V_{DS}	Drain-Source Voltage	20	V
V_{GS}	Gate-Source Voltage	± 12	V
I_D	Continuous Drain Current- $T_C=25^\circ C^1$	180	A
	Continuous Drain Current- $T_C=100^\circ C^1$	120	A
I_{DM}	Pulse Drain Current Tested ^{note1}	480	A
E_{AS}	Single Pulsed Avalanche Energy ^{note2}	120	mJ
P_D	Power Dissipation- $T_C=25^\circ C$	52	W
T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55 to +150	$^\circ C$

Thermal Characteristics:

Symbol	Parameter	Max	Units
$R_{\theta JC}$	Thermal Resistance, Junction to Case	2.4	$^\circ C/W$

Package Marking and Ordering Information:

Part NO.	Marking	Package
DON180N02	180N02	DFN5*6-8

Electrical Characteristics: (Tc=25℃ unless otherwise noted)

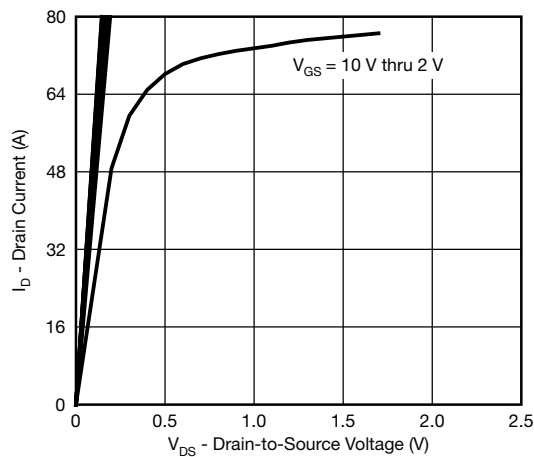
Symbol	Parameter	Conditions	Min	Typ	Max	Units
Off Characteristics						
BV _{DSS}	Drain-Sourctce Breakdown Voltage	V _{GS} =0V,I _D =250 μ A	20	---	---	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{Ds} =20V, V _{GS} =0V,T _J =25℃	---	---	1	μ A
I _{GSS}	Gate-Source Leakage Current	V _{GS} =± 12V, V _{Ds} =0A	---	---	± 100	nA
On Characteristics						
V _{GS(th)}	GATE-Source Threshold Voltage	V _{GS} =V _{DS} , I _D =250 μ A	0.4	---	1.0	V
R _{DS(ON)}	Drain-Source On Resistanc ^{note3}	V _{GS} =4.5V,I _D =30A	---	1.5	2	m Ω
		V _{GS} =2.5V,I _D =20A	---	2.2	3	m Ω
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{Ds} =10V, V _{GS} =0V, f=1MHz	---	6400	---	pF
C _{Oss}	Output Capacitance		---	920	---	
C _{rss}	Reverse Transfer Capacitance		---	890	---	
Switching Characteristics						
t _{d(on)}	Turn-On Delay Time	VDD=10V , VGS=4.5V , RG=1.8Ω , I _D =30A	---	9.5	---	ns
t _r	Rise Time		---	35	---	ns
t _{d(off)}	Turn-Off Delay Time		---	62	---	ns
t _f	Fall Time		---	50	---	ns
Q _g	Total Gate Charge	V _{GS} =10V, V _{Ds} =30V, I _D =4.5A	---	92	---	nC
Q _{gs}	Gate-Source Charge		---	7.1	---	nC
Q _{gd}	Gate-Drain “Miller” Charge		---	36	---	nC
Drain-Source Diode Characteristics						
I _S	Continuous Source Current	V _G =V _D =0V ,	---	---	180	A
I _{SM}	Pulsed Source Current	Force Current	---	---	480	A

V_{SD}	Diode Forward Voltage ²	V _{GS} =0V , I _S =30A , T _J =25℃	---	---	1.1	V
T_{rr}	Reverse Recovery Time	I _F =30A , dI/dt=100A/μs , T _J =25℃	---	23	---	ns
Q_{rr}	Reverse Recovery Charge		---	10	---	nC

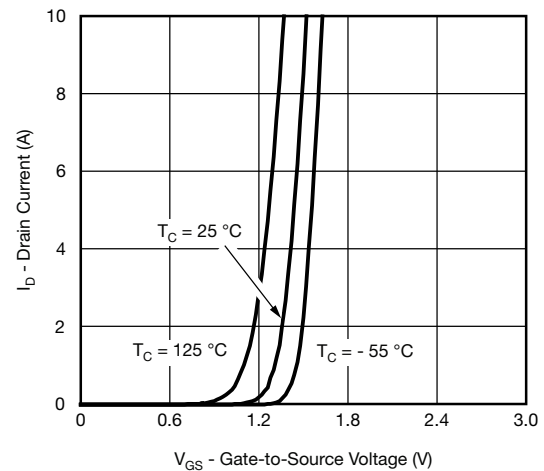
Notes:

1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
2. EAS condition: T_J=25℃, V_{DD}=10V, V_{GS}=4.5V, R_G=25Ω, L=0.5mH, I_{AS}=19A
3. Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%

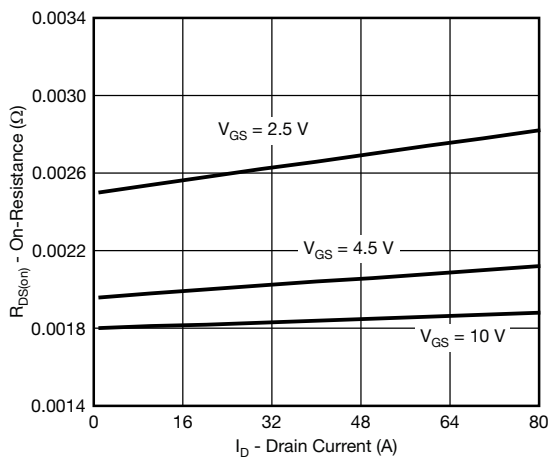
Typical Characteristics: (T_C=25℃ unless otherwise noted)



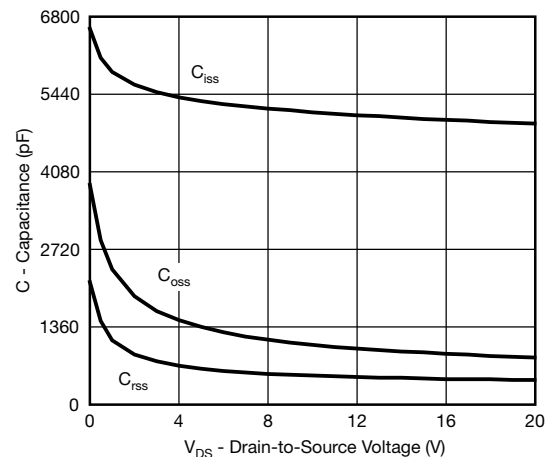
Output Characteristics



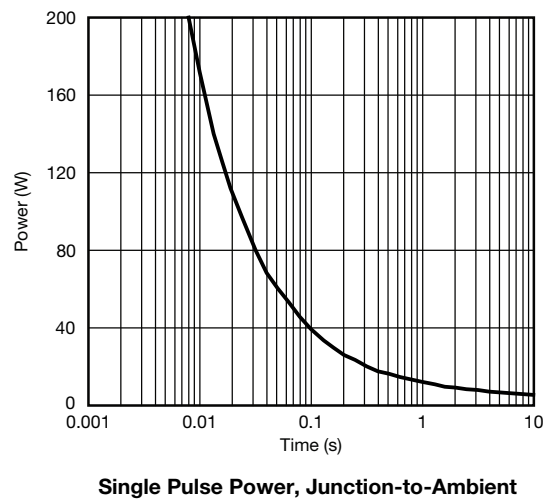
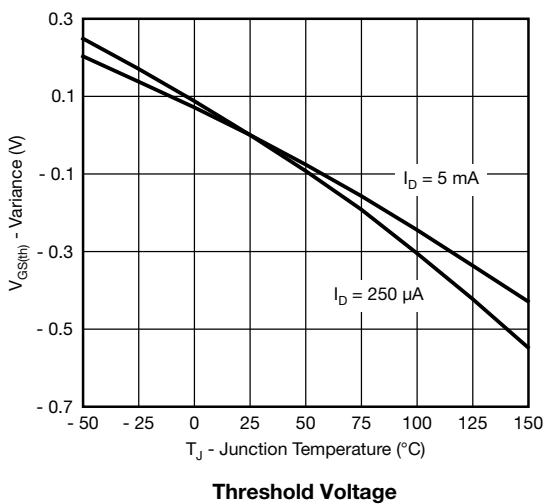
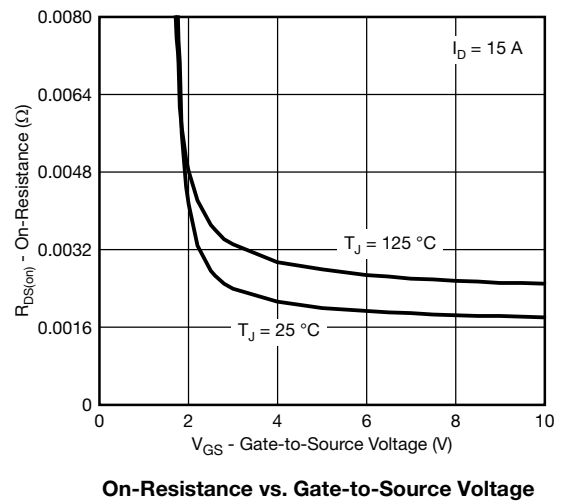
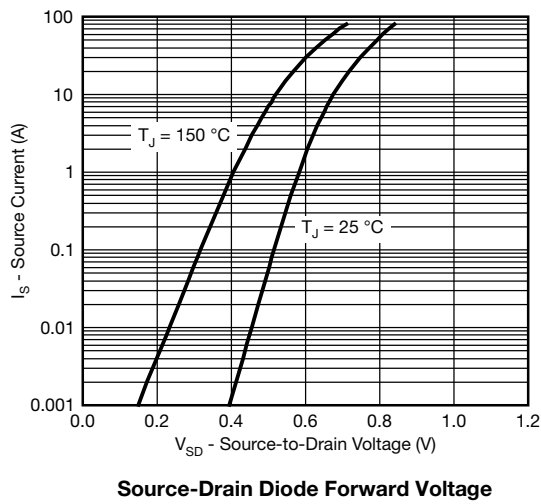
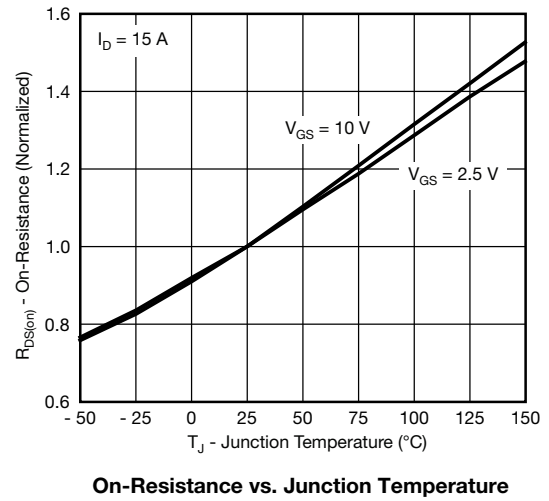
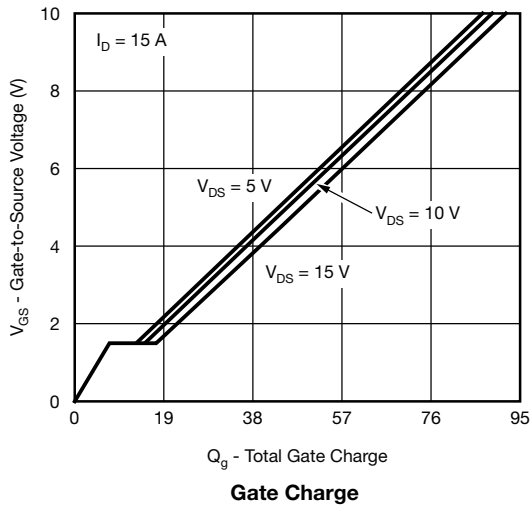
Transfer Characteristics

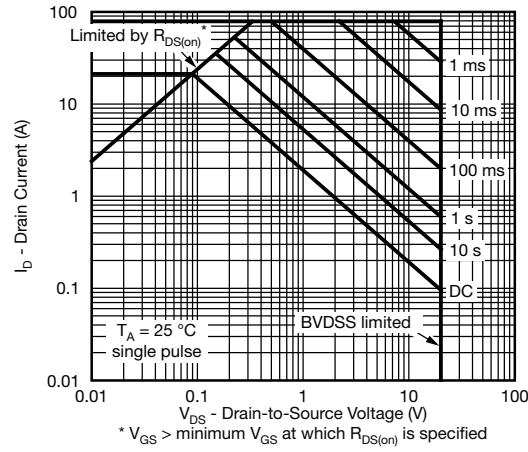


On-Resistance vs. Drain Current and Gate Voltage



Capacitance





Safe Operating Area, Junction-to-Ambient