

30V/20A N-Channel MOSFET

Features

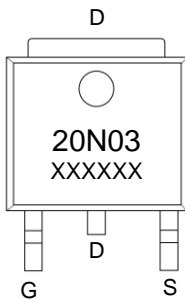
- Trench Power LV MOSFET technology
- High density cell design for low $R_{DS(ON)}$

Product Summary

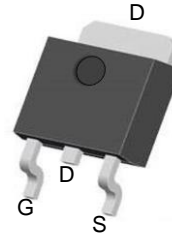
V_{DS}	$R_{DS(ON)}$ MAX	I_D MAX
30V	35m Ω @10V	20A
	45m Ω @4.5V	

Application

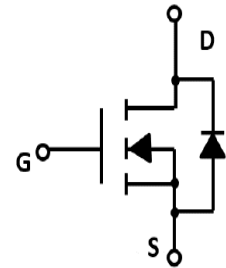
- Battery protection
- Load switch
- Power management



20N03 : Device code
XXXXXX : Code



TO-252 top view



Schematic diagram

Marking and pin assignment

Absolute Maximum Ratings ($T_A=25^\circ\text{C}$ unless otherwise noted)				
Symbol	Parameter		Rating	Unit
Common Ratings ($T_C=25^\circ\text{C}$ Unless Otherwise Noted)				
V_{DS}	Drain-Source Breakdown Voltage		30	V
V_{GS}	Gate-Source Voltage		± 12	V
T_J	Maximum Junction Temperature		150	$^\circ\text{C}$
T_{STG}	Storage Temperature Range		-50 to 155	$^\circ\text{C}$
I_S	Diode Continuous Forward Current	$T_C=25^\circ\text{C}$	20	A
Mounted on Large Heat Sink				
I_{DM}	Pulse Drain Current Tested	$T_C=25^\circ\text{C}$	65	A
I_D	Continuous Drain Current@ $GS=10V$	$T_C=25^\circ\text{C}$	20	A
P_D	Maximum Power Dissipation	$T_C=25^\circ\text{C}$	1.2	W
$R_{\theta JA}$	Thermal Resistance Junction-Ambient>(*1 in2 Pad of 2-oz Copper), Max.)		104	$^\circ\text{C/W}$

Electrical Characteristics (T_J=25°C unless otherwise noted)						
Symbol	Parameter	Condition	Min	Typ	Max	Unit
Static Electrical Characteristics @ T_J = 25°C (unless otherwise stated)						
BV _{(BR)DSS}	Drain-Source Breakdown Voltage	VGS=0V, ID=250μA	30	--	--	V
I _{DSS}	Zero Gate Voltage Drain Current	VDS=30V, VGS=0V	--	--	1	uA
I _{GSS}	Gate-Body Leakage Current	VGS=±12V, VDS=0V	--	--	±100	nA
V _{GS(th)}	Gate Threshold Voltage	VDS=VGS, ID=250μA	0.65	0.9	1.5	V
R _{DS(on)}	Drain-Source On-State Resistance	VGS=10V, ID=5.8A	--	21	35	mΩ
		VGS=4.5V, ID=5.0A	--	27	45	
		VGS=2.5V, ID=4.0A	--	33	60	
Dynamic Electrical Characteristics @ T_J = 25°C (unless otherwise stated)						
C _{ISS}	Input Capacitance	VDS=15V, VGS=0V, f=1MHz	--	632	--	pF
C _{OSS}	Output Capacitance		--	58	--	pF
C _{RSS}	Reverse Transfer Capacitance		--	70	--	pF
Switching Characteristics						
Q _g	Total Gate Charge	VDS=15V, ID=5.8A, VGS=10V	--	17.3	--	nC
Q _{gs}	Gate Source Charge		--	2.2	--	nC
Q _{gd}	Gate Drain Charge		--	2.1	--	nC
t _{d(on)}	Turn-on Delay Time	VDD=15V, ID=5.8A, VGS=10V, RG=3Ω	--	4.4	--	nS
t _r	Turn-on Rise Time		--	28.3	--	nS
t _{d(off)}	Turn-Off Delay Time		--	16.5	--	nS
t _f	Turn-Off Fall Time		--	26.3	--	nS
Source- Drain Diode Characteristics						
V _{SD}	Forward on voltage	T _J =25°C, I _S =5.8A,	--	--	1.2	V

Typical Operating Characteristics

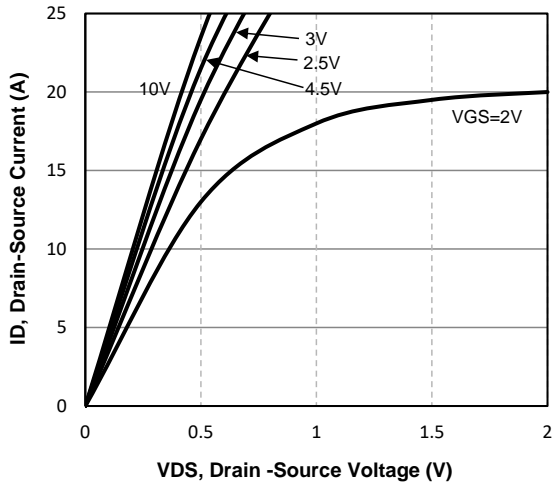


Fig1. Typical Output Characteristics

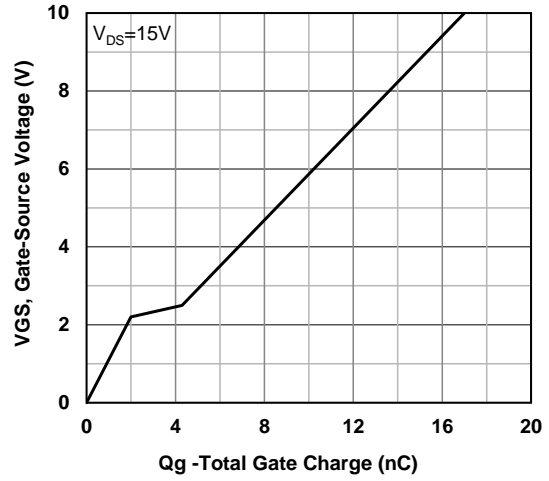


Fig2. Typical Gate Charge Vs. Gate-Source Voltage

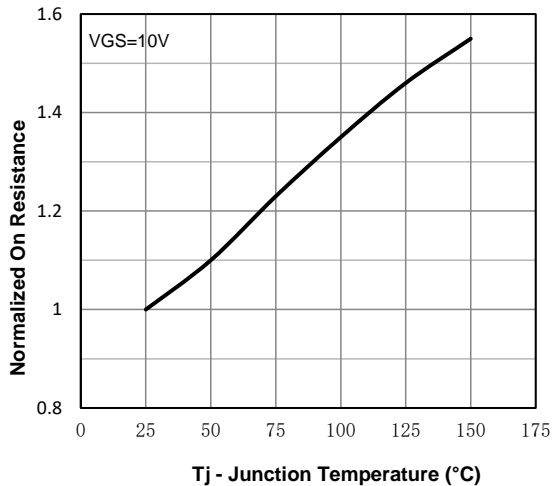


Fig3. Normalized On-Resistance Vs. Temperature

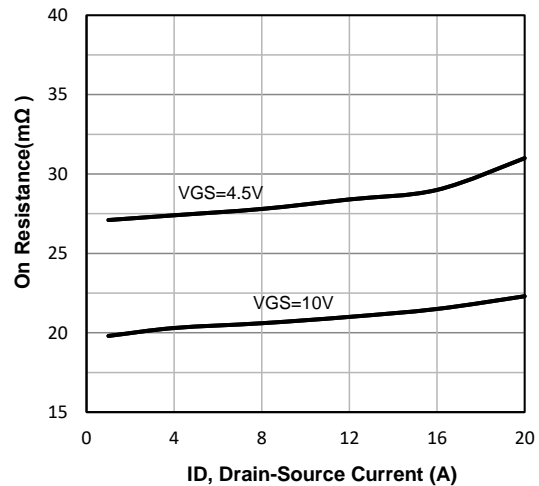


Fig4. On-Resistance Vs. Drain-Source

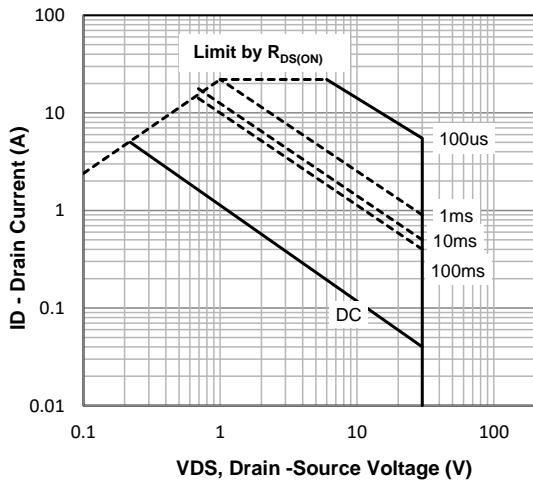


Fig5. Maximum Safe Operating Area

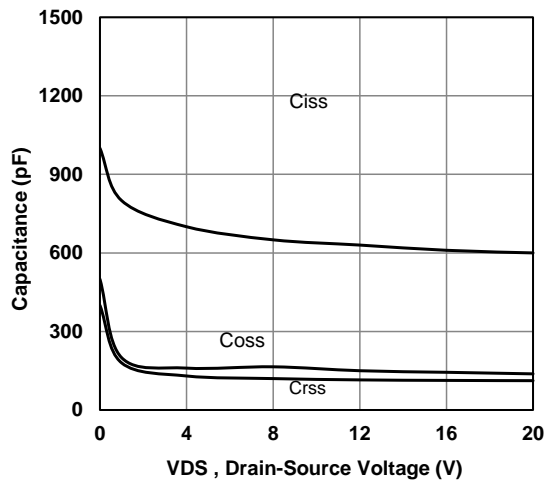
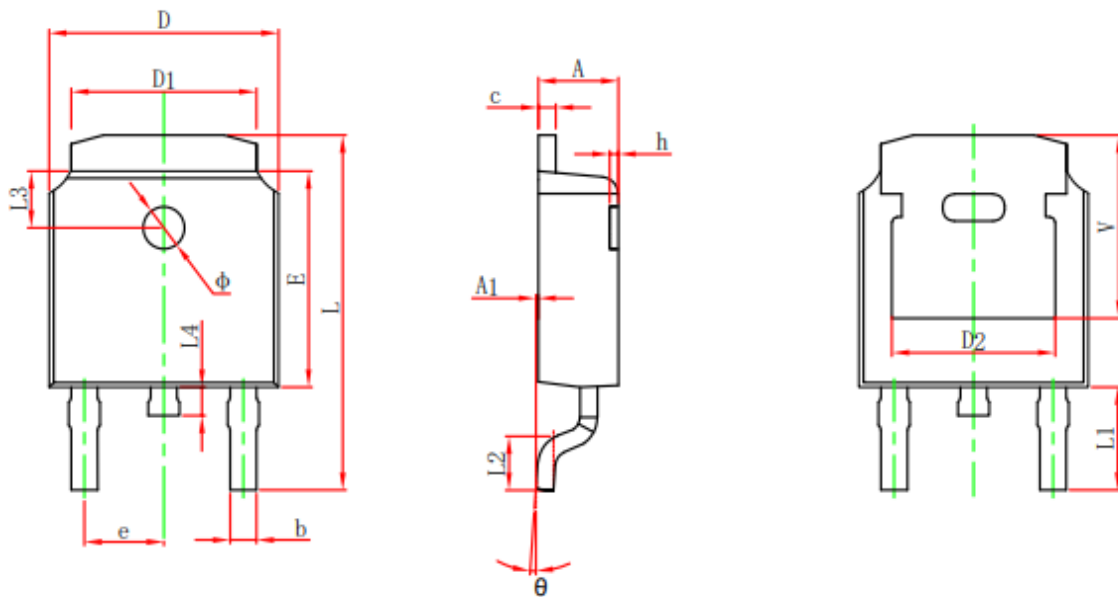


Fig6 Typical Capacitance Vs. Drain-Source Voltage

TO-252 Package information



Symbol	Dimensions in Millimeters		Dimensions in Inches	
	Min.	Max.	Min.	Max.
A	2.200	2.400	0.087	0.094
A1	0.000	0.127	0.000	0.005
b	0.635	0.770	0.025	0.030
c	0.460	0.580	0.018	0.023
D	6.500	6.700	0.256	0.264
D1	5.100	5.460	0.201	0.215
D2	4.830 REF.		0.190 REF.	
E	6.000	6.200	0.236	0.244
e	2.186	2.386	0.086	0.094
L	9.712	10.312	0.382	0.406
L1	2.900 REF.		0.114 REF.	
L2	1.400	1.700	0.055	0.067
L3	1.600 REF.		0.063 REF.	
L4	0.600	1.000	0.024	0.039
Φ	1.100	1.300	0.043	0.051
θ	0°	8°	0°	8°
h	0.000	0.300	0.000	0.012
V	5.250 REF.		0.207 REF.	

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