30V/20A N-Channel MOSFET

Features

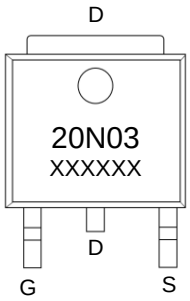
- Trench Power LV MOSFET technology
- High density cell design for low $R_{DS(ON)}$

Product Summary

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

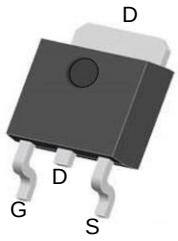
Application

- Battery protection
- Load switch
- Power management

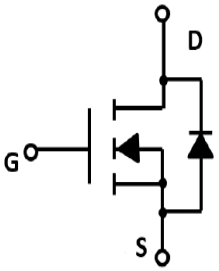


20N03 : Device code
XXXXXX : Code

Marking and pin assignment



TO-252 top view

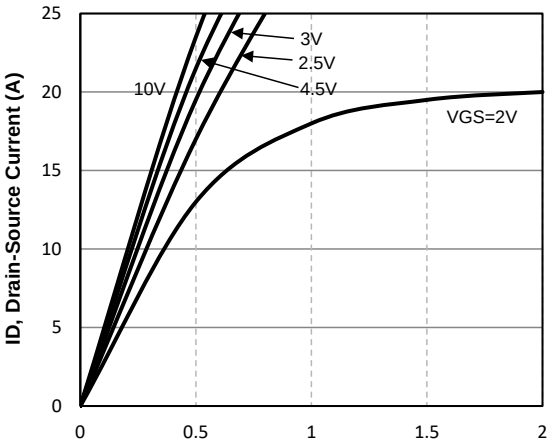


Schematic diagram

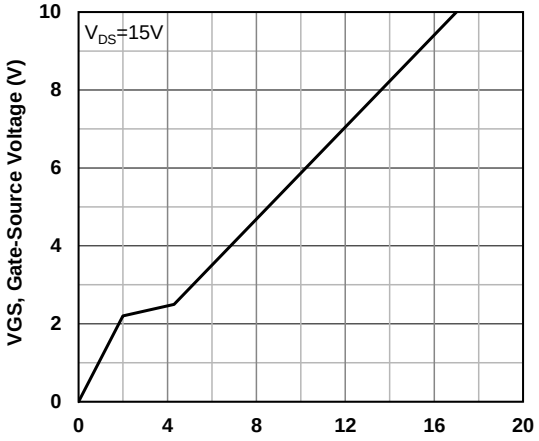
Absolute Maximum Ratings (TA=25℃unless otherwise noted)				
Symbol	**Parameter**		**Rating**	**Unit**
Common Ratings (TC=25°C Unless Otherwise Noted)				
V_{DS}	Drain-Source Breakdown Voltage		30	V
V_{GS}	Gate-Source Voltage		±12	V
T_J	Maximum Junction Temperature		150	°C
T_{STG}	Storage Temperature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

Electrical Characteristics (TJ=25℃ unless otherwise noted)						
Symbol	**Parameter**	**Condition**	**Min**	**Typ**	**Max**	**Unit**
Static Electrical Characteristics @ TJ = 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 @ TJ = 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	Tj=25℃，Is=5.8A，	--	--	1.2	V

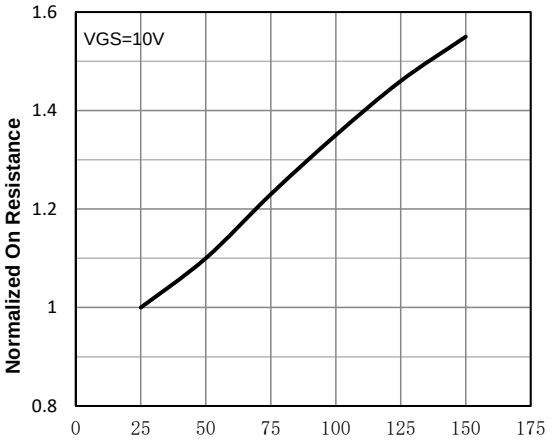
Typical Operating Characteristics



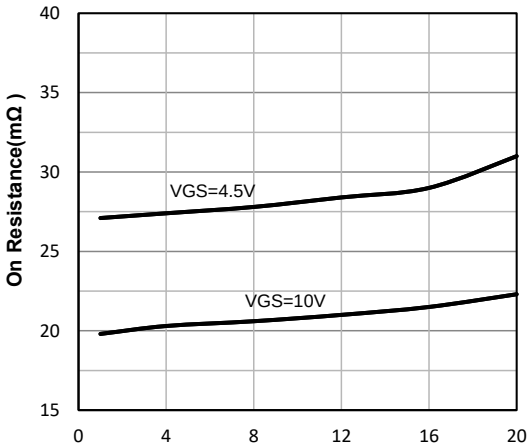
VDS, Drain -Source Voltage (V)
Fig1. Typical Output Characteristics



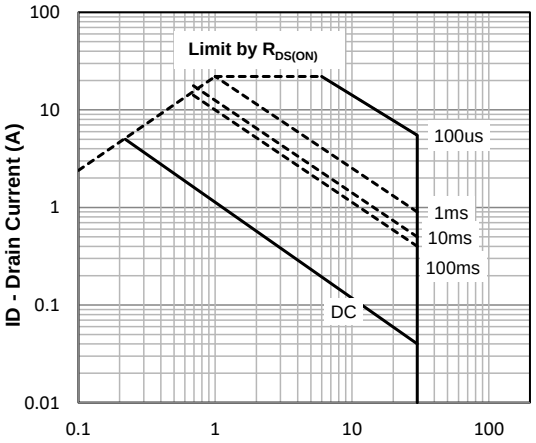
Qg -Total Gate Charge (nC)
Fig2. Typical Gate Charge Vs.Gate-Source Voltage



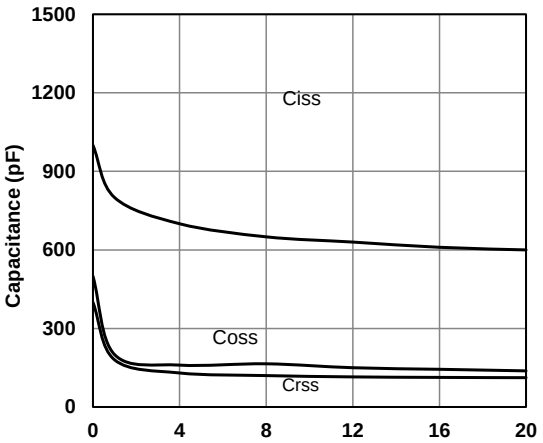
Tj - Junction Temperature (°C)
Fig3. Normalized On-Resistance Vs. Temperature



ID, Drain-Source Current (A)
Fig4. On-Resistance Vs. Drain-Source

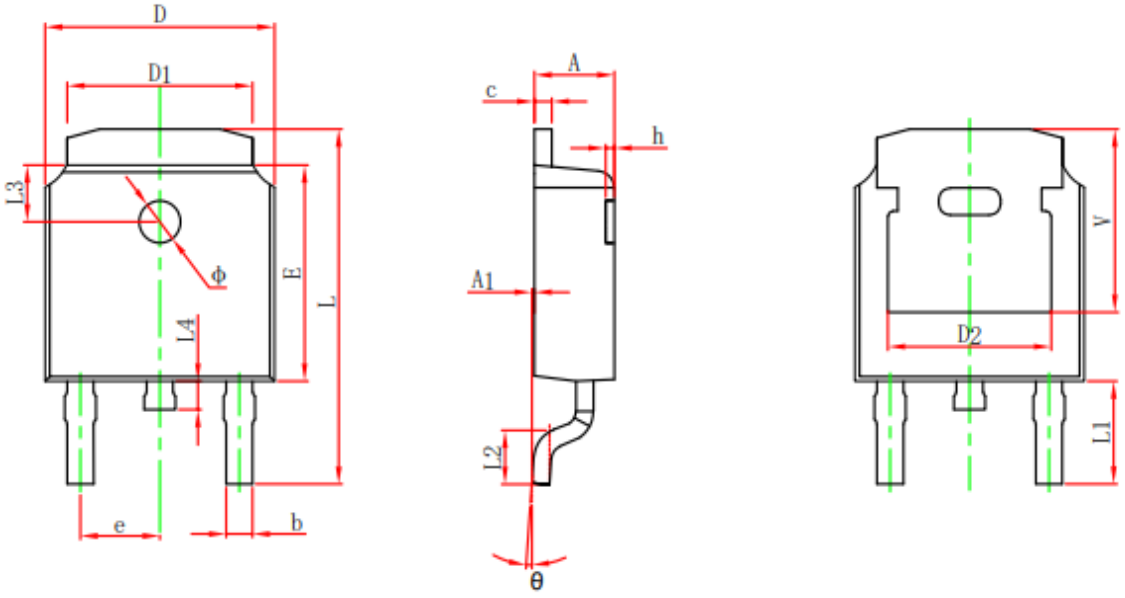


VDS, Drain -Source Voltage (V)
Fig5. Maximum Safe Operating Area



VDS , Drain-Source Voltage (V)
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.	