

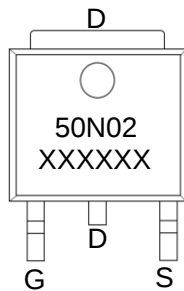
20V/50A N-Channel MOSFET

Features

- High density cell design for ultra low $R_{DS(on)}$
- Fully characterized avalanche voltage and current
- Good stability and uniformity with high E_{AS}
- Excellent package for good heat dissipation

Application

- Load switching
- Hard switched and high frequency circuits
- Uninterruptible power supply

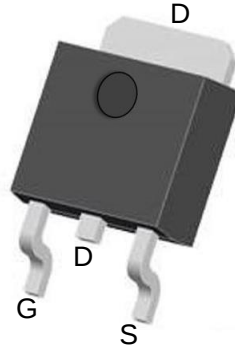


50N02 : Device code
XXXXXX : Code

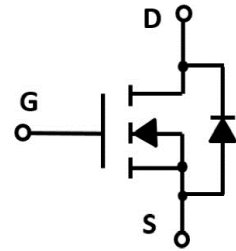
Marking and pin assignment

Product Summary

V_{DS}	$R_{DS(ON)} MAX$	$I_D MAX$
20V	10mΩ@4.5V	50A
	13mΩ@2.5V	



TO-252 top view



Schematic diagram

Absolute Maximum Ratings (TA=25°C unless otherwise noted)

Symbol	Parameter		Rating	Unit
Common Ratings (TC=25°C Unless Otherwise Noted)				
V _{DS}	Drain-Source Breakdown Voltage		20	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	50	A
Mounted on Large Heat Sink				
I _{DM}	Pulse Drain Current Tested	Tc=25°C	200	A
I _D	Continuous Drain Current@GS=10V	Tc=25°C	50	A
P _D	Maximum Power Dissipation	Tc=25°C	31	W
E _{AS}	Single pulse avalanche energy		11.25	mJ

Electrical Characteristics (TJ=25°C 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	20	--	--	V
IDSS	Zero Gate Voltage Drain Current	VDS=20V, VGS=0V	--	--	1	uA
IGSS	Gate-Body Leakage Current	VGS=±12V, VDS=0V	--	--	±100	nA
VGS(th)	Gate Threshold Voltage	VDS=VGS, ID=250μA	0.4	0.75	1.2	V
RDS(on)	Drain-Source On-State Resistance	VGS=4.5V, ID=20A	--	6.8	10	mΩ
		VGS=2.5V, ID=18A	--	8	13	
Dynamic Electrical Characteristics @ TJ = 25°C (unless otherwise stated)						
CISS	Input Capacitance	VDS=10V, VGS=0V, f=1MHz	--	1460	--	pF
COSS	Output Capacitance		--	240	--	pF
CRSS	Reverse Transfer Capacitance		--	215	--	pF
Switching Characteristics						
Qg	Total Gate Charge	VDS=10V, ID=25A, VGS=10V	--	20	--	nC
Qgs	Gate Source Charge		--	3	--	nC
Qgd	Gate Drain Charge		--	6.5	--	nC
t _{d(on)}	Turn-on Delay Time	VDD=10V, ID=10A, VGS=4.5V, RG=3Ω	--	10	--	nS
t _r	Turn-on Rise Time		--	20	--	nS
t _{d(off)}	Turn-Off Delay Time		--	40	--	nS
t _f	Turn-Off Fall Time		--	20	--	nS
Source- Drain Diode Characteristics						
VSD	Forward on voltage	Tj=25°C, Is=20A,	--	--	1.2	V

Typical Operating Characteristics

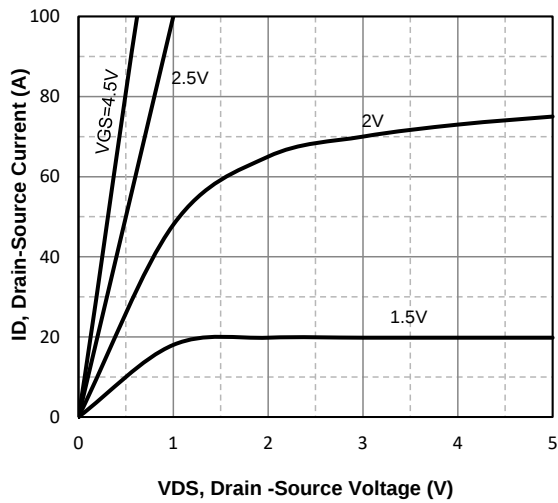


Fig1. Typical Output Characteristics

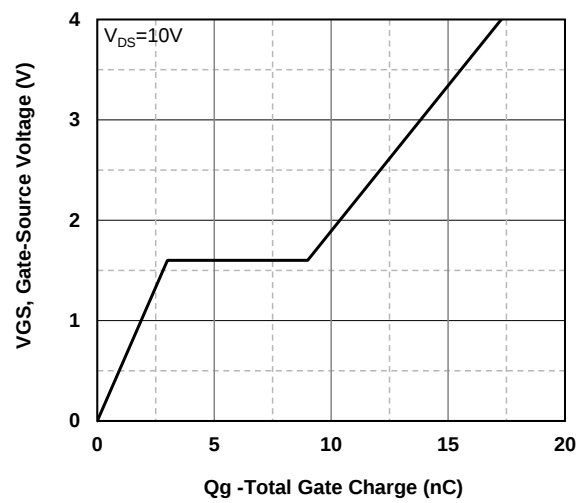


Fig2. Typical Gate Charge Vs. Gate-Source Voltage

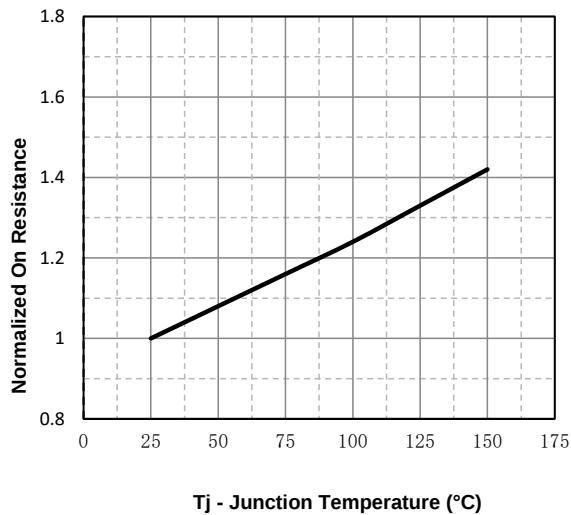


Fig3. Normalized On-Resistance Vs. Temperature

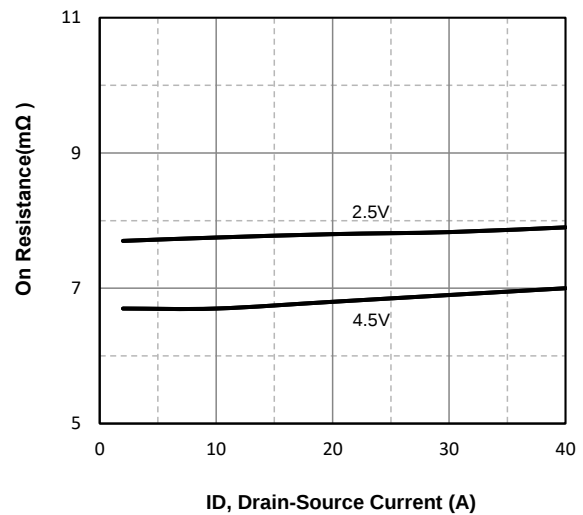


Fig4. On-Resistance Vs. Drain-Source Current

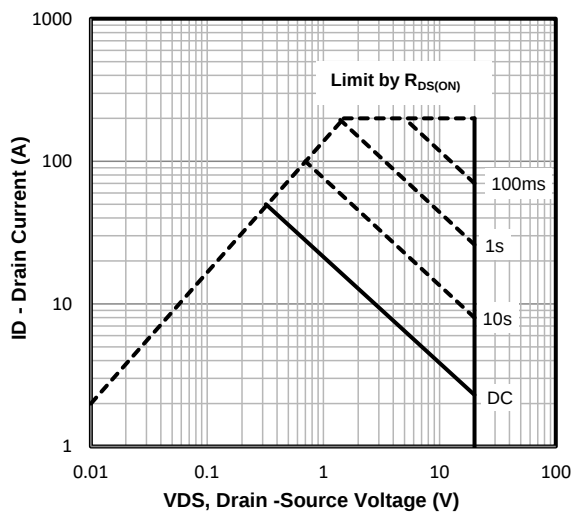


Fig5. Maximum Safe Operating Area

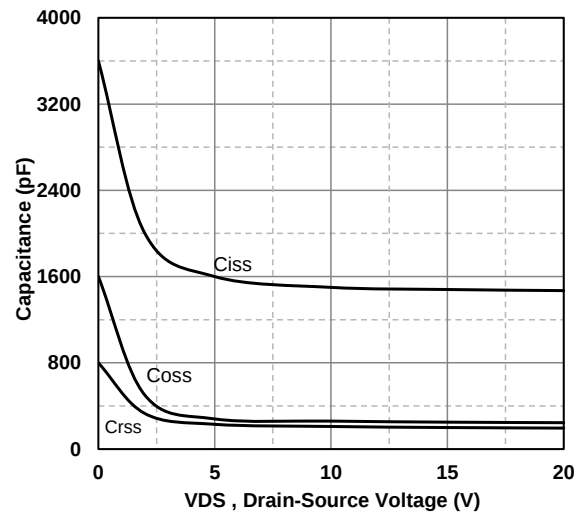
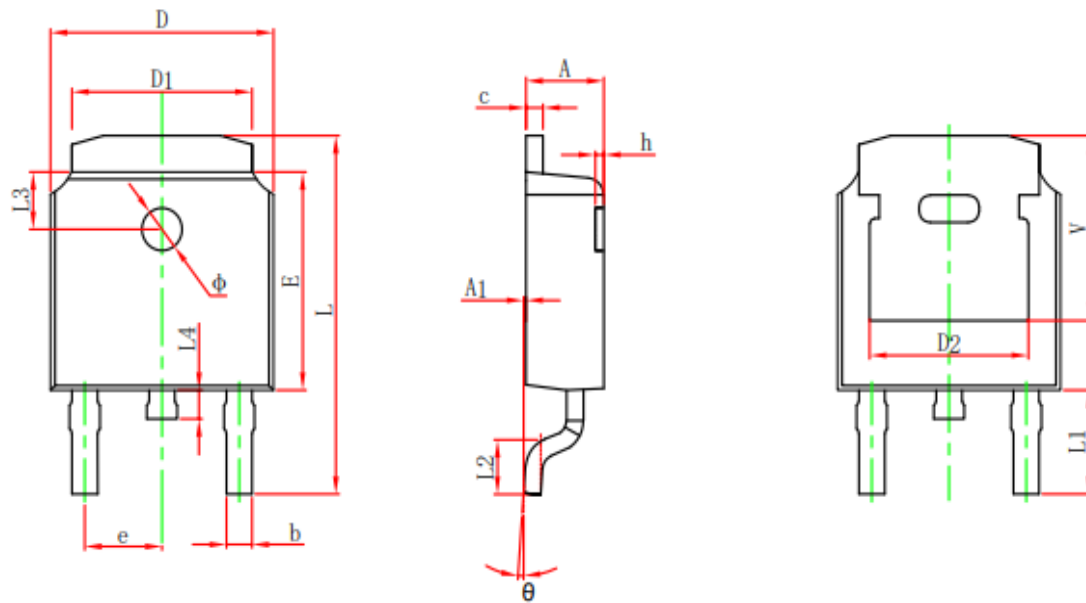


Fig6 Typical Capacitance Vs. Drain-Source

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.	