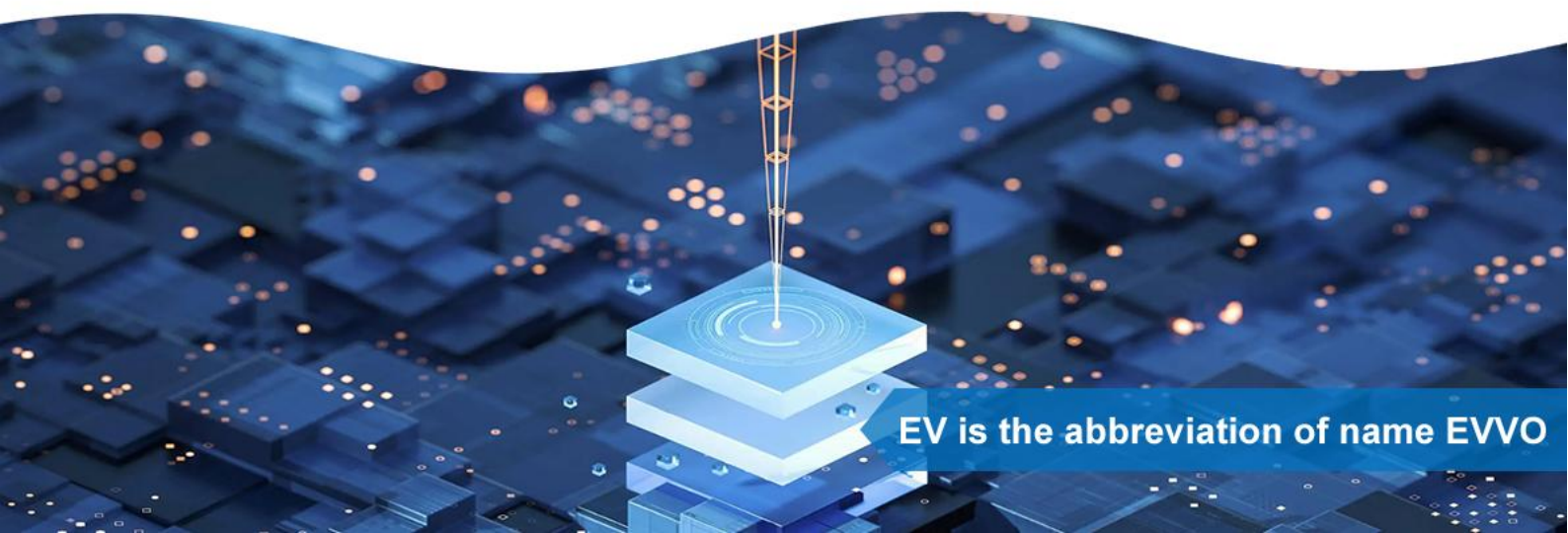
EVVOSEMI®
THINK CHANGE DO

ESD TVS MOS LDO Diode Sensor DC-DC

Product Specification

Domestic Part Number	IRFB38N20D
Overseas Part Number	IRFB38N20D
Equivalent Part Number	IRFB38N20D



250V N-Channel Enhancement Mode MOSFET

Description

The IRFB38N20D is silicon N -channel Enhanced VDMOSFETs, is obtained by the self-aligned planar Technology which reduce the conduction loss, improve switching performance and enhance the avalanche energy. The transistor can be used in various power switching circuit for system miniaturization and higher efficiency.

Product Summary

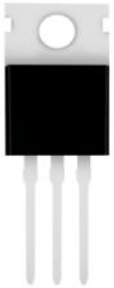
VDS =250V,ID =50A

RDS(ON) <85mΩ@ VGS=10V

Application

Power amplifier

Pin Configuration



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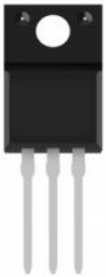

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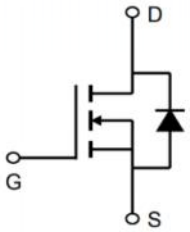

Absolute Maximum Ratings

Symbol	Parameter	Value	Unit
VDSS	Drain-Source Voltage (V_{GS} = 0V)	250	V
ID	Continuous Drain Current	50	A
IDM	Pulsed Drain Current	180	A
VGSS	Gate-Source Voltage	±30	V
E_{AS}	Single Pulse Avalanche Energy	973	mJ
IAS	Avalanche Current	36	A
E_{AR}	Repetitive Avalanche Energy	584	mJ
P_D	Power Dissipation (T_C = 25°C)	65	W
TJ, Tstg	Operating Junction and Storage Temperature Range	-55~+150	°C
RthJC	Thermal Resistance, Junction-to-Case	0.89	K/W
RthJA	Thermal Resistance, Junction-to-Ambient	60	K/W

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Electrical Characteristics (TJ=25℃ unless otherwise specified)

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Units
V(BR)DSS	Drain-SourceBreakdown Voltage	V_{GS} = 0V, I_D = 250μA	250	--	--	V
IDSS	Zero Gate Voltage Drain Current	V_{DS} = 250V, V_{GS} = 0V, T_J = 25℃	--	--	1	μA
IGSS	Gate-Source Leakage	V_{GS} = ±30V	--	--	±100	nA
VGS(th)	Gate-Source Threshold Voltage	V_{DS} = V_{GS}, I_D = 250μA	2	--	4	V
RDS(on)	Drain-SourceOn-Resistance (Note3)	V_{GS} = 10V, I_D = 22.5A	--	70	85	mΩ
C_{iss}	Input Capacitance	V_{GS} = 0V, V_{DS} = 25V, f = 1.0MHz	--	3539	--	pF
C_{oss}	Output Capacitance		--	535	--	
C_{rss}	Reverse Transfer Capacitance		--	309	--	
Q_g	Total Gate Charge	V_{DD} = 200V, I_D = 45A, V_{GS} = 10V	--	244	--	nC
Q_{gs}	Gate-Source Charge		--	16	--	
Q_{gd}	Gate-Drain Charge		--	143	--	
td(on)	Turn-on Delay Time	V_{DD} = 125V, I_D =45A, R_G = 25 Ω	--	57	--	ns
t_r	Turn-on Rise Time		--	145	--	
td(off)	Turn-off Delay Time		--	960	--	
t_f	Turn-off Fall Time		--	235	--	
IS	Continuous Body Diode Current	T_C = 25 ℃	--	--	45	A
ISM	Pulsed Diode Forward Current		--	--	180	
V_{SD}	Body Diode Voltage	T_J = 25℃, I_{SD} = 22.5A, V_{GS} = 0V	--	--	1.4	V
trr	Reverse Recovery Time	V_{GS} = 0V,I_S = 10A, di_F/dt =100A /μs	--	264	--	ns
Q_{rr}	Reverse Recovery Charge		--	3	--	μC

Notes

1、Repetitive Rating: Pulse width limited by maximum junction temperature
2、L = 1.0mH, V_{DD} = 50V, R_G = 25 Ω, Starting T_J = 25 ℃
3、Pulse Test: Pulse width ≤ 300μs, Duty Cycle ≤ 1%

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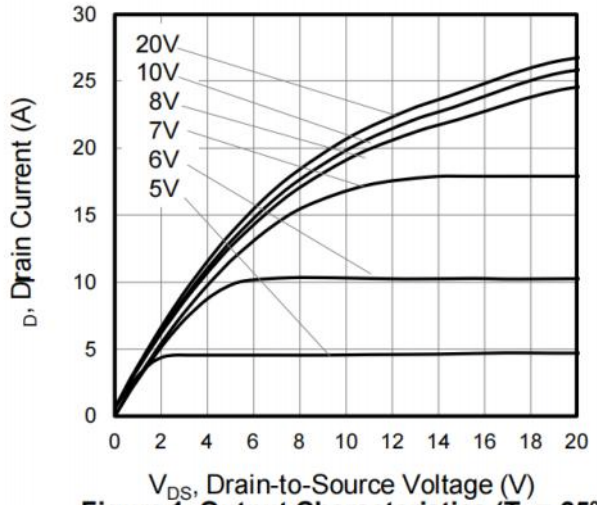

Figure 1. Output Characteristics (T_J = 25°C)

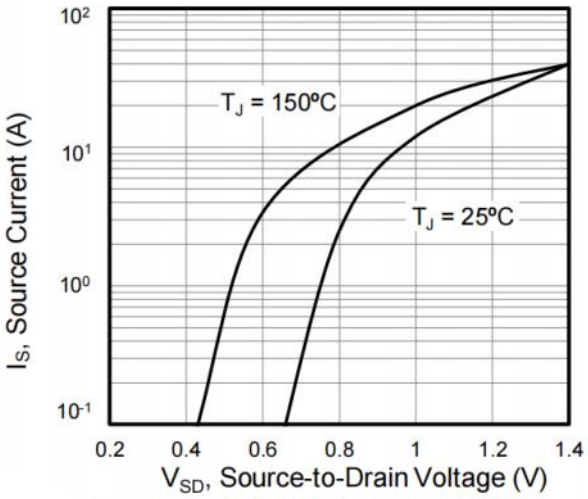

Figure 2. Body Diode Forward Voltage

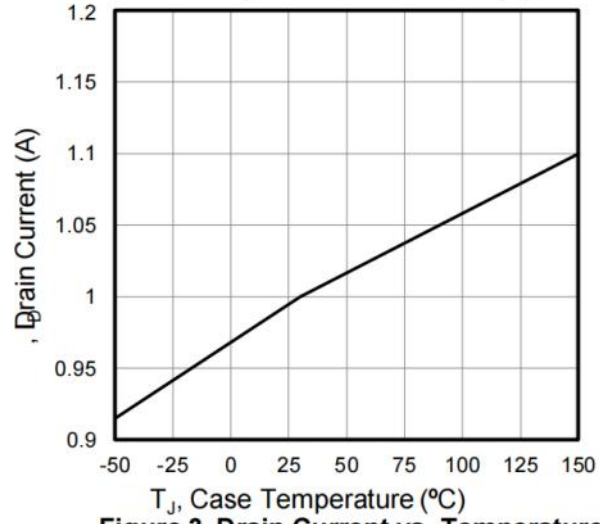

Figure 3. Drain Current vs. Temperature

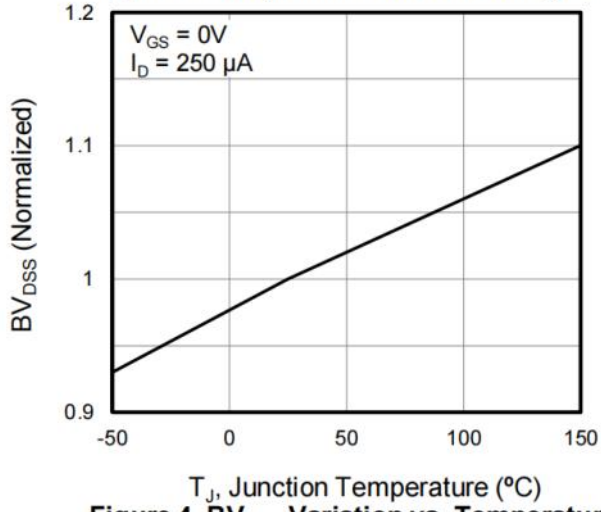

Figure 4. BV_{DSS} Variation vs. Temperature

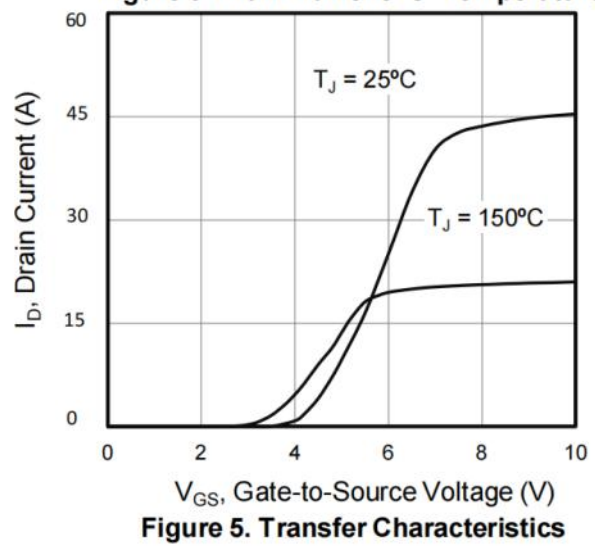

Figure 5. Transfer Characteristics

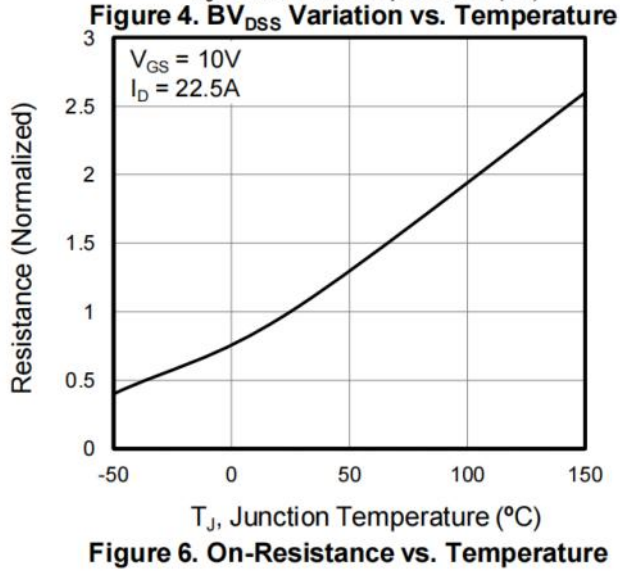

Figure 6. On-Resistance vs. Temperature

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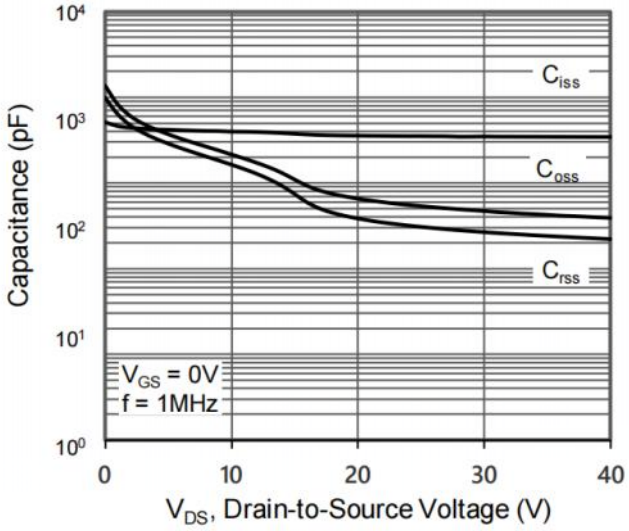

Figure 7. Capacitance

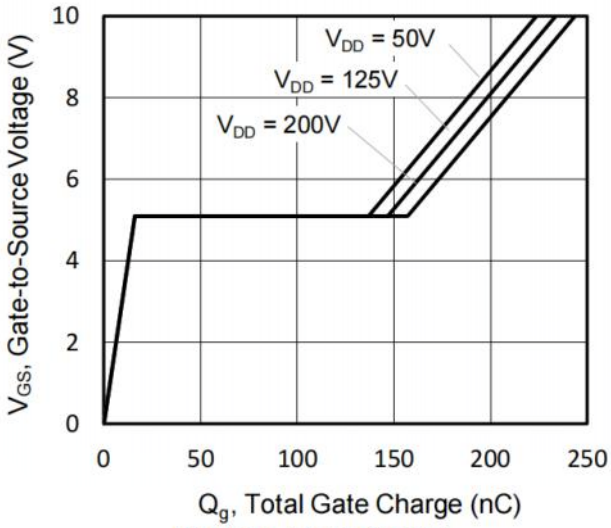

Figure 8. Gate Charge

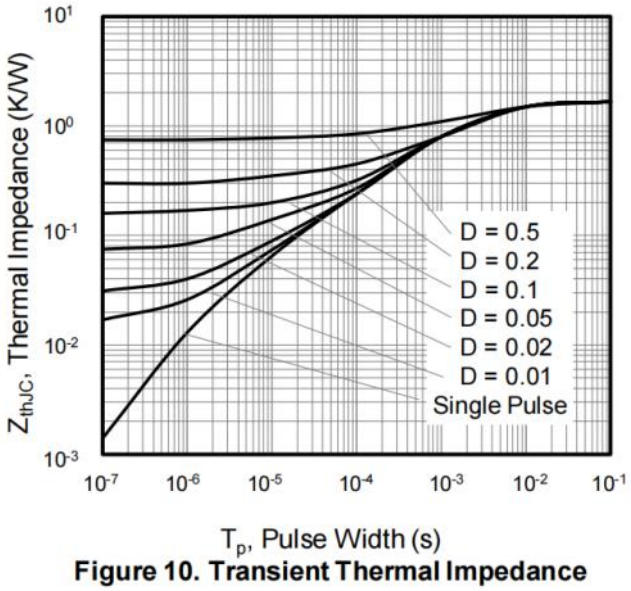

Figure 10. Transient Thermal Impedance

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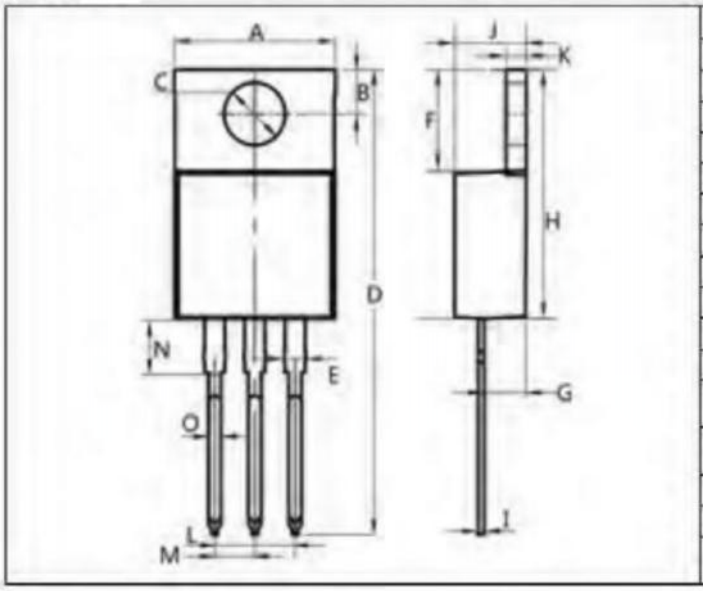
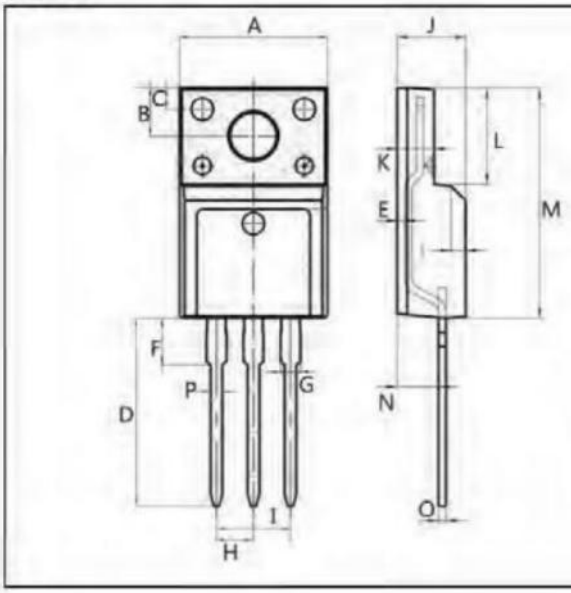


Dim.	Min.	Max.
A	10.0	10.4
B	2.5	3.0
C	3.5	4.0
D	28.0	30.0
E	1.1	1.5
F	6.2	6.6
G	2.9	3.3
H	15.0	16.0
I	0.35	0.45
J	4.3	4.7
K	1.2	1.4
L	Typ 5.08	
M	Typ 2.54	
N	3.1	3.5
O	0.7	0.9
All Dimensions in millimeter		

TO-220F



Dim.	Min.	Max.
A	9.9	10.3
B	2.9	3.5
C	1.15	1.45
D	12.75	13.25
E	0.55	0.75
F	3.1	3.5
G	1.25	1.45
H	Typ 2.54	
I	Typ 5.08	
J	4.55	4.75
K	2.4	2. 7
L	6.35	6.75
M	15.0	16.0
N	2.75	3.15
O	0.45	0.60
P	0.7	0.9
All Dimensions in millimeter		

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