TVMNB220

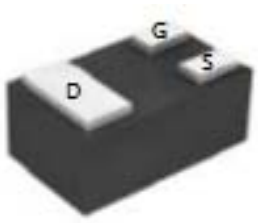
20V N-Channel MOSFETs

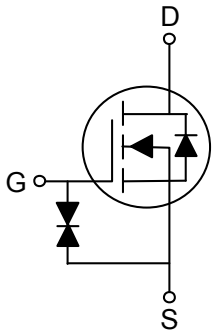
General Description

The TVMNB220 designed by the trench processing techniques to achieve extremely low on-resistance. And fast switching speed and improved transfer effective.

BV_{DSS}	$R_{DS(ON)}$	I_D
20 V	220 mΩ	0.7 A

SOT-883 Pin Configuration





Features

- V_{DS}=20V, I_D=0.7A
- $R_{DS(ON)}$(typ.) < 210mΩ@V_{GS}=2.5V
- $R_{DS(ON)}$(typ.) < 180mΩ@V_{GS}=4.5V
- Low On-Resistance
- Fast Switching
- Lead-Free, RoHS Compliant

Applications

- Load Switch

Absolute Maximum Ratings T_C=25°C unless otherwise noted

Symbol	Parameter	Rating	Unit
V_{DS}	Drain-Source Voltage	20	V
V_{GS}	Gate-Source Voltage	±8	V
T_J	Operating Junction Temperature Range	-50 to 150	°C
T_{STG}	Storage Temperature Range	-50 to 150	°C
I_S	Diode Continuous Forward Current	0.7	A

Mounted On Large Heat Sink

Symbol	Parameter	Rating	Unit
I_{DM}	Drain Current - Pulsed (T_C=25°C)	3	A
I_D	Drain Current - Continuous (V_{GS}=10V) (T_C=25°C)	0.7	A
	Drain Current - Continuous (V_{GS}=10V) (T_C=100°C)	0.5	
P_D	Maximum Power Dissipation (T_C=25°C)	0.55	W
$R_{\theta JA}$	Thermal Resistance Junction to Ambient	100	°C/W

Electrical Characteristics (T_J=25°C, unless otherwise noted)

Off Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V , I_D=250uA	20	---	---	V
I_{DSS}	Drain-Source Leakage Current	V_{DS}=20V , V_{GS}=0V , T_C=25°C	---	---	1	uA
		V_{DS}=20V , V_{GS}=0V , T_C=125°C	---	---	100	uA
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±8V , V_{DS}=0V	---	---	±100	nA

On Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$R_{DS(ON)}$	Static Drain-Source On-Resistance	V_{GS}=4.5V , I_D=0.5A	---	180	220	mΩ
		V_{GS}=2.5V , I_D=0.3A	---	210	260	
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D=250uA	0.4	0.8	1.2	V

Dynamic and switching Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
Q_g	Total Gate Charge	V_{DS}=10V , V_{GS}=4.5V , I_D=0.5A	---	1.1	---	nC
Q_{gs}	Gate-Source Charge		---	0.3	---	
Q_{gd}	Gate-Drain Charge		---	0.2	---	
$T_{d(on)}$	Turn-On Delay Time	V_{DD}=10V , V_{GS}=4.5V , R_G=6Ω , I_D=0.3A , R_L=5Ω	---	2.2	---	nS
T_r	Rise Time		---	4	---	
$T_{d(off)}$	Turn-Off Delay Time		---	18	---	
T_f	Fall Time		---	9	---	
C_{iss}	Input Capacitance	V_{DS}=10V , V_{GS}=0V , F=1MHz	---	40	---	pF
C_{oss}	Output Capacitance		---	15	---	
C_{rss}	Reverse Transfer Capacitance		---	6.5	---	

Drain-Source Diode Characteristics and Ratings

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_{SD}	Source-Drain Current (Body Diode)	T_C=25°C	---	---	0.5	A
I_{SM}	Pulsed Source-Drain Current (Body Diode)		---	---	3	A
V_{SD}	Diode Forward Voltage	V_{GS}=0V , I_{SD}=0.5A , T_J=25°C	---	0.75	1.2	V

Characteristics Curves

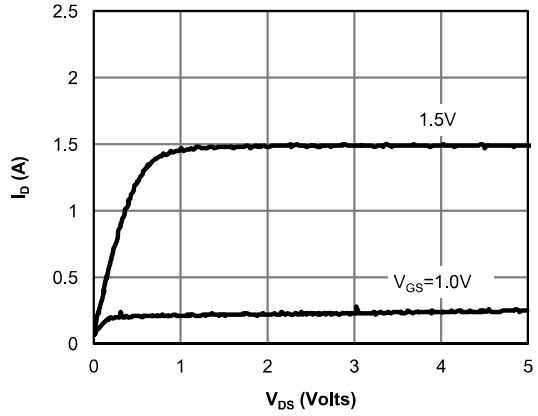


Figure 1: On-Region Characteristics

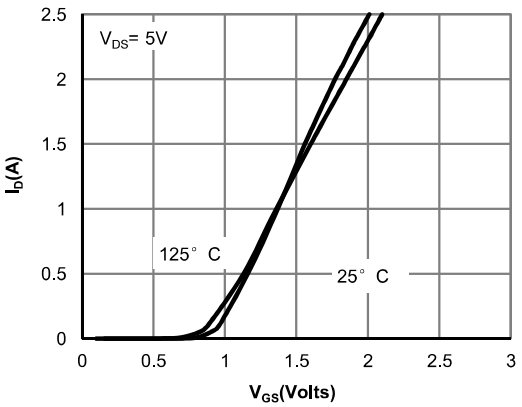


Figure 2: Transfer Characteristics

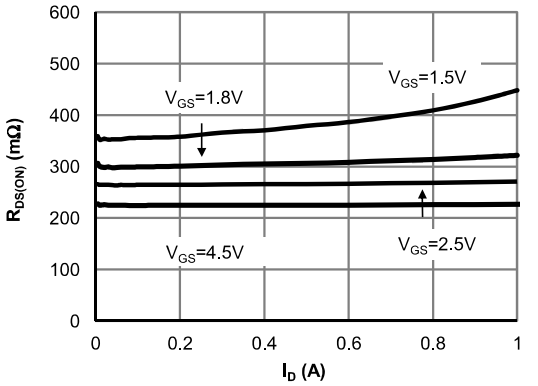


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

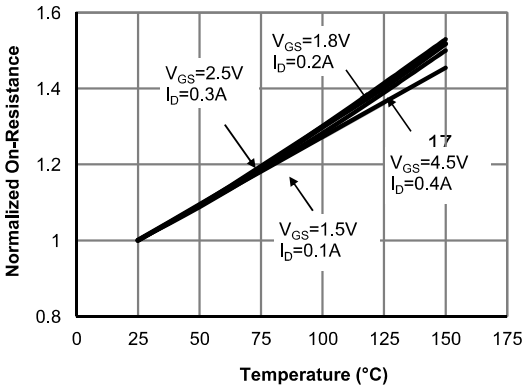


Figure 4: On-Resistance vs. Junction Temperature

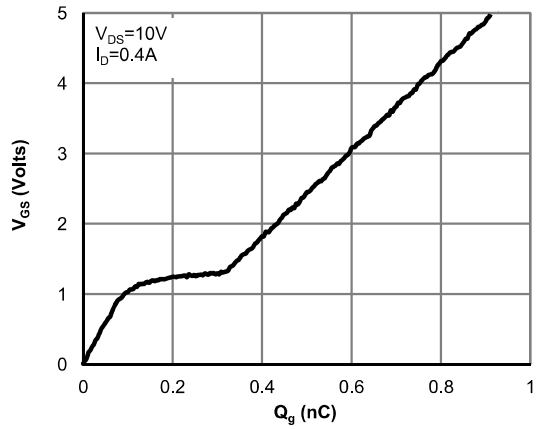


Figure 5: Gate-Charge Characteristics

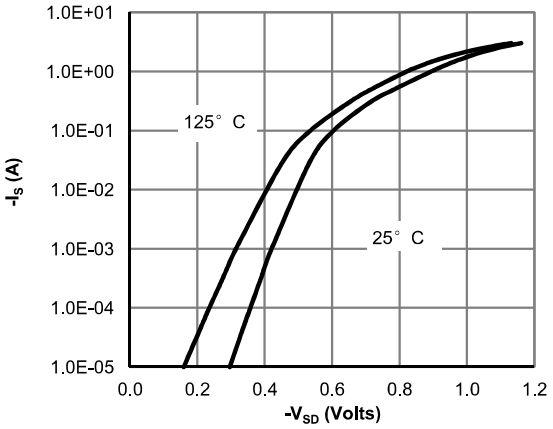


Figure 6: Body-Diode Characteristics

Characteristics Curves

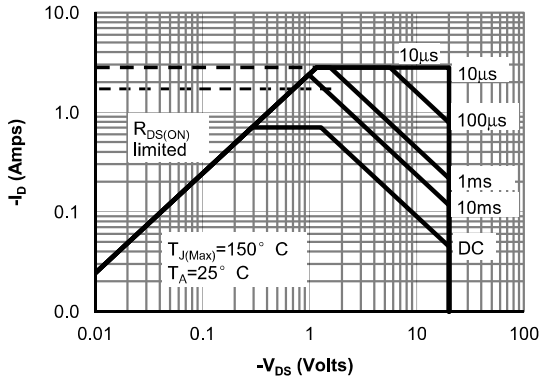


Figure 7 : Maximum Forward Biased Safe Operating Area

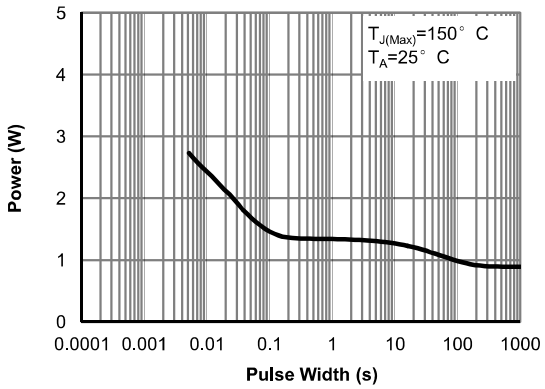


Figure 8 : Single Pulse Power Rating Junction-to-Ambient

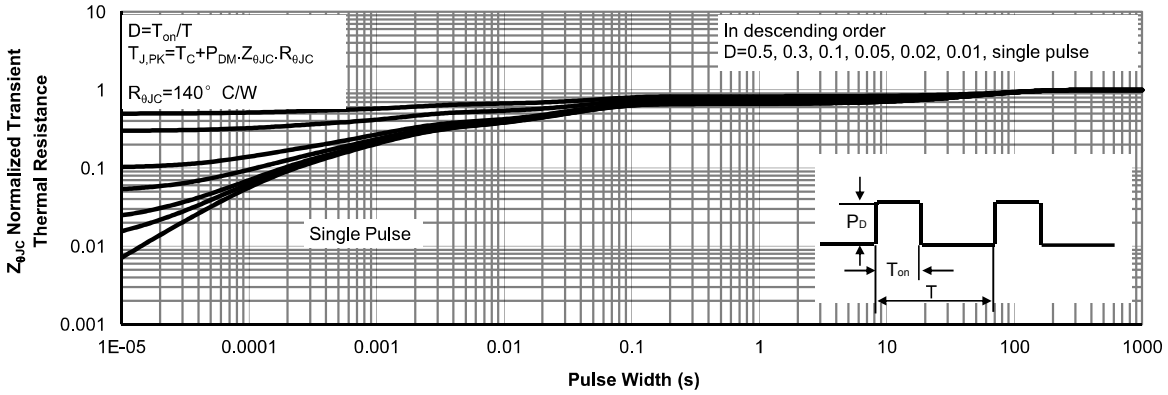


Figure 9 : Normalized Maximum Transient Thermal Impedance

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