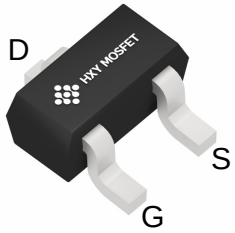
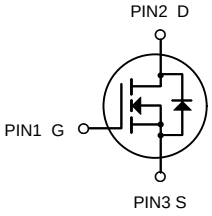
Description

The VTN138KWA uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 4.5V. This device is suitable for use as a Battery protection or in other Switching application.



SOT-323



N-Channel MOSFET

General Features

V_{DS} = 60V I_D = 0.115A

$R_{DS(ON)}$ < 3Ω@ V_{GS}=10 V

Application

Battery protection

Load switch

Uninterruptible power supply

Ordering Information

Product ID	Pack	Brand	Qty(PCS)
VTN138KWA	SOT-323	HXY MOSFET	3000

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

Symbol	Parameter	Limit	Unit
V_{DS}	Drain-Source Voltage	60	V
V_{GS}	Gate-Source Voltage	±20	V
I_D	Drain Current-Continuous	0.115	A
P_D	Maximum Power Dissipation	0.2	W
T_J,T_{STG}	Operating Junction and Storage Temperature Range	-55 To 150	°C
$R_{\theta JA}$	Thermal Resistance,Junction-to-Ambient	625	°C/W

Electrical Characteristics (T_A=25°C unless otherwise noted)

Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS}=0 V, I_D=250 μA	60			V
Gate-Threshold Voltage	$V_{(GS)th}$	V_{DS}=V_{GS}, I_D=250 μA	1	1.6	2.5	
Gate-body Leakage	I_{GSS}	V_{DS}=0 V, V_{GS}=±20 V			±80	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=60 V, V_{GS}=0 V			80	nA
On-state Drain Current	$I_{D(on)}$	V_{GS}=10 V, V_{DS}=7 V	500			mA
Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS}=10 V, I_D=115mA		1.3	3	Ω
		V_{GS}=4.5V, I_D=50mA		2	5	
Forward Trans conductance	g_{fs}	V_{DS}=10 V, I_D=200mA	80			ms
Drain-source on-voltage	$V_{DS(on)}$	V_{GS}=10V, I_D=500mA			3.75	V
		V_{GS}=5V, I_D=50mA			0.375	V
Diode Forward Voltage	V_{SD}	I_S=115mA, V_{GS}=0 V	0.55		1.2	V
Input Capacitance *	C_{iss}	V_{DS}=25V, V_{GS}=0V, f=1MHz			50	pF
Output Capacitance *	C_{oss}				25	
Reverse Transfer Capacitance *	C_{rss}				5	

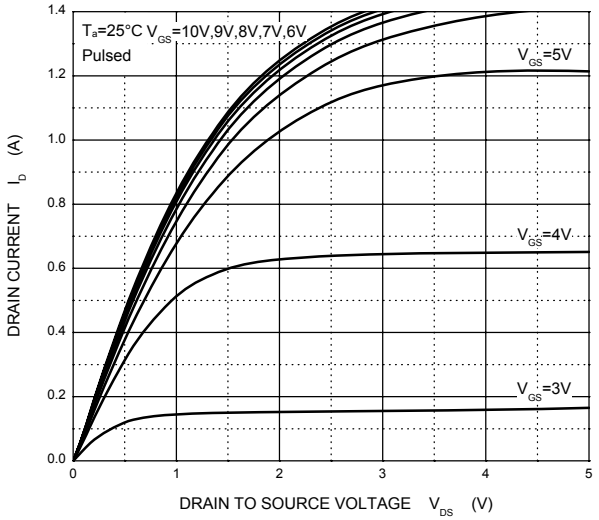
Switching Time

Turn-on Time *	$t_{d(on)}$	V_{DD}=25 V, R_L=50Ω, I_D=500mA,V_{GEN}=10 V R_G=25Ω			20	ns
Turn-off Time*	$t_{d(off)}$				40	

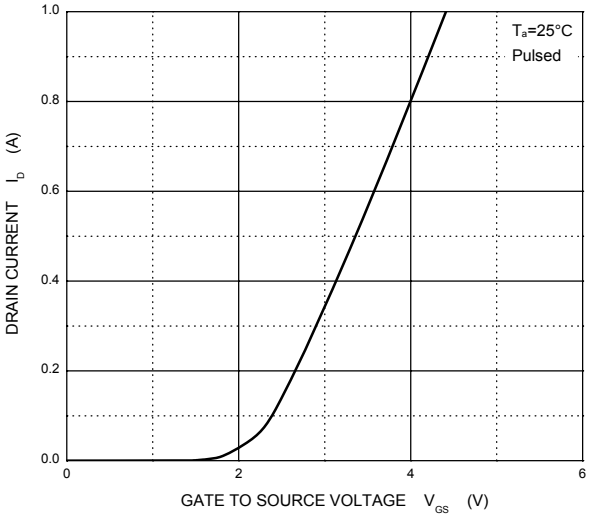
*These parameters have no way to verify.

Typical Characteristics

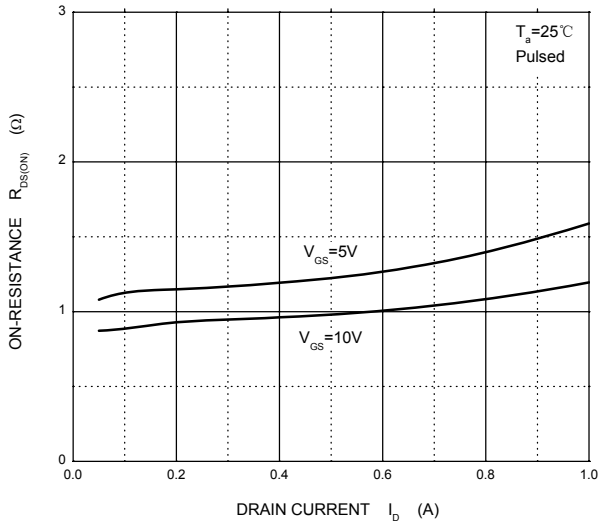
Output Characteristics



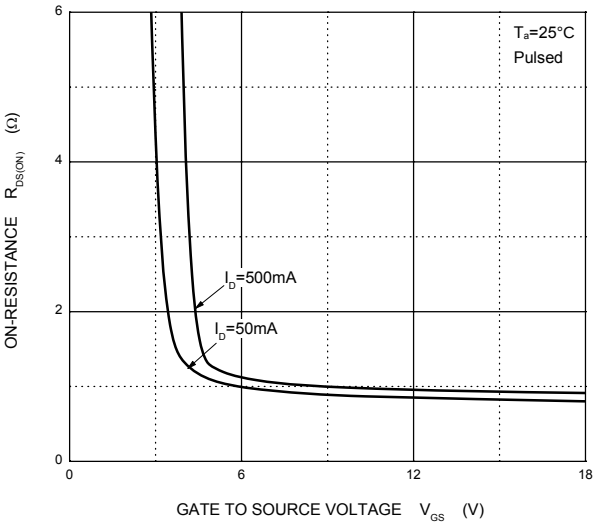
Transfer Characteristics



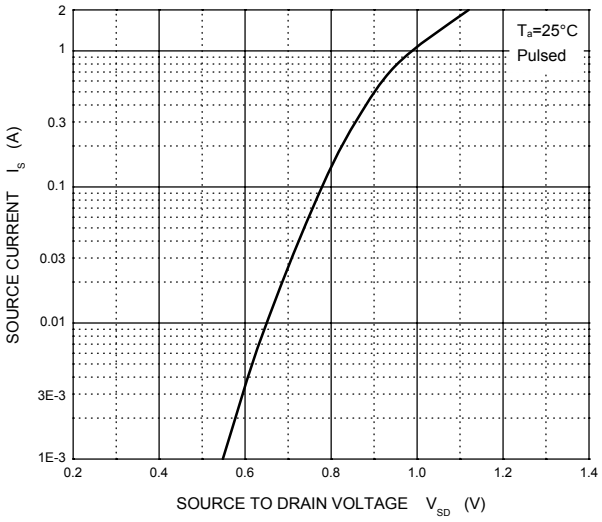
$R_{DS(ON)}$ — I_D



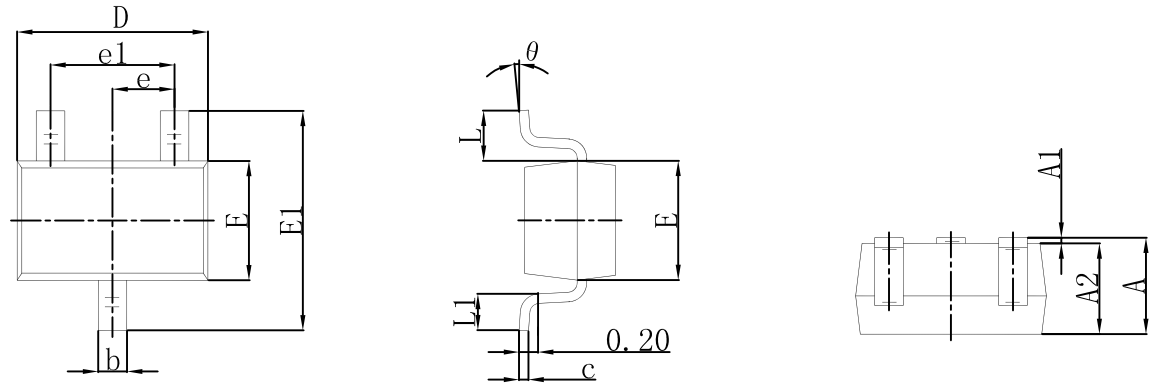
$R_{DS(ON)}$ — V_{GS}



I_S — V_{SD}



SOT-323 Package Outline Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.100	0.035	0.043
A1	0.000	0.100	0.000	0.004
A2	0.900	1.000	0.035	0.039
b	0.200	0.400	0.008	0.016
c	0.080	0.150	0.003	0.006
D	2.000	2.200	0.079	0.087
E	1.150	1.350	0.045	0.053
E1	2.150	2.450	0.085	0.096
e	0.650 TYP		0.026 TYP	
e1	1.200	1.400	0.047	0.055
L	0.525 REF		0.021 REF	
L1	0.260	0.460	0.010	0.018
K	0°	8°	0°	8°

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