



Description

The NVTR4503NT1G uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 2.5V. This device is suitable for use as a Battery protection or in other Switching application.



SOT-23

General Features

$V_{DS} = 30V$ $I_D = 2A$

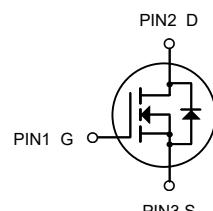
$R_{DS(ON)} < 98m\Omega$ @ $V_{GS}=10V$

Application

Battery protection

Load switch

Uninterruptible power supply



N-Channel MOSFET

Package Marking and Ordering Information

Product ID	Pack	Brand	Qty(PCS)
NVTR4503NT1G	SOT-23	HXY MOSFET	3000

Absolute Maximum Ratings ($T_A=25^\circ C$ unless otherwise noted)

Symbol	Parameter	Limit	Unit
V_{DS}	Drain-Source Voltage	30	V
V_{GS}	Gate-Source Voltage	± 12	V
I_D	Drain Current-Continuous	2	A
I_{DM}	Drain Current-Pulsed ^(Note 1)	12	A
P_D	Maximum Power Dissipation	0.85	W
T_J, T_{STG}	Operating Junction and Storage Temperature Range	-55 To 150	$^\circ C$
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient ^(Note 2)	162	$^\circ C/W$



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

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
V _{(BR)DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250μA	30	-	-	V
I _{DS}	Zero Gate Voltage Drain Current	V _{DS} =20V, V _{GS} =0V,	-	-	1.0	μA
I _{GS}	Gate to Body Leakage Current	V _{DS} =0V, V _{GS} =±12V	-	-	±100	nA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250μA	0.6	0.9	1.2	V
R _{DS(on)}	Static Drain-Source on-Resistance note2	V _{GS} =10V, I _D =2A	-	86	98	mΩ
		V _{GS} =4.5V, I _D =2A	-	90	110	
C _{iss}	Input Capacitance	V _{DS} =10V, V _{GS} =0V, f=1.0MHz	-	184	-	pF
C _{oss}	Output Capacitance		-	38	-	pF
C _{rss}	Reverse Transfer Capacitance		-	28	-	pF
Q _g	Total Gate Charge	V _{DS} =10V, I _D =3A, V _{GS} =4.5V	-	2.7	-	nC
Q _{gs}	Gate-Source Charge		-	0.4	-	nC
Q _{gd}	Gate-Drain("Miller") Charge		-	0.5	-	nC
t _{d(on)}	Turn-on Delay Time	V _{DS} =10V, I _D =3A, R _{GEN} =3Ω, V _{GS} =4.5V	-	8	-	ns
t _r	Turn-on Rise Time		-	27	-	ns
t _{d(off)}	Turn-off Delay Time		-	26	-	ns
t _f	Turn-off Fall Time		-	33	-	ns
I _S	Maximum Continuous Drain to Source Diode Forward Current		-	-	3	A
I _{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	12	A
V _{SD}	Drain to Source Diode Forward Voltage	V _{GS} =0V, I _S =3A	-	-	2.0	V

Notes:1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature

2. Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%



Typical Characteristics

Figure 1: Output Characteristics

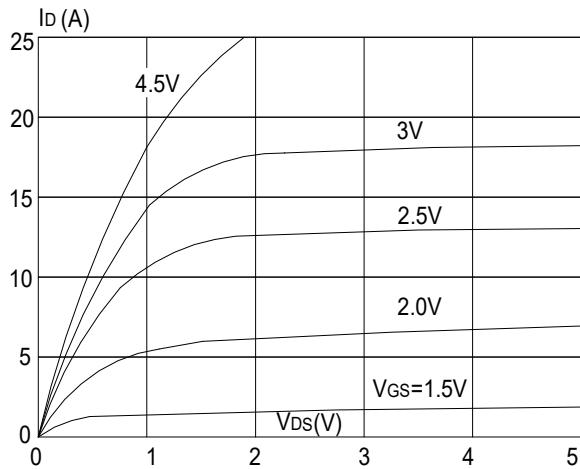


Figure 3: On-resistance vs. Drain Current

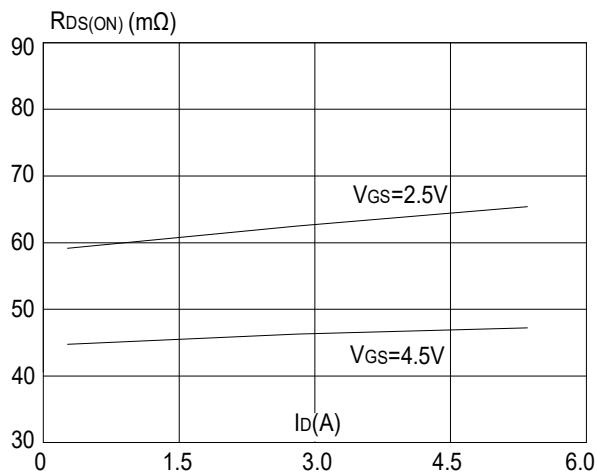


Figure 5: Gate Charge Characteristics

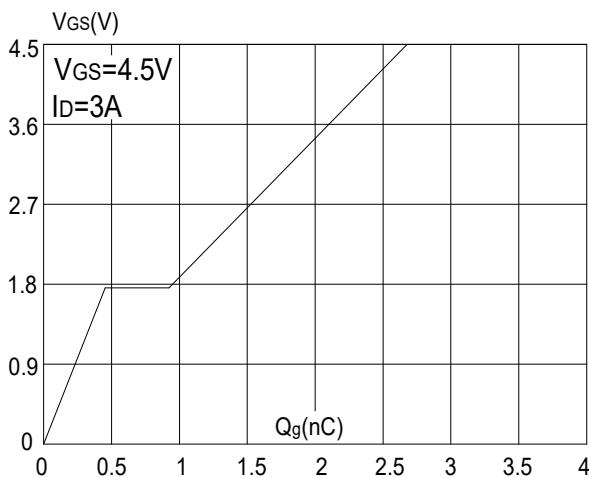


Figure 2: Typical Transfer Characteristics

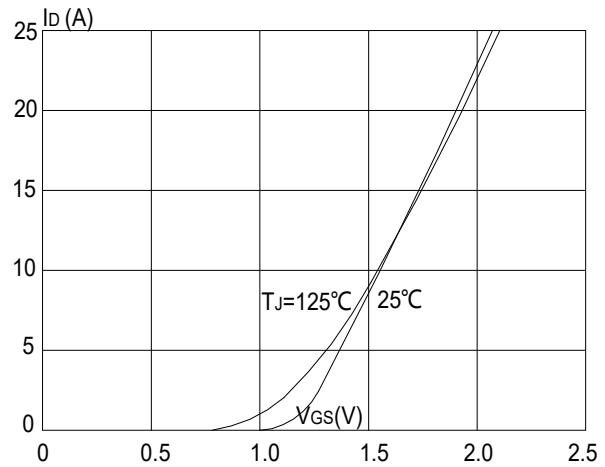


Figure 4: Body Diode Characteristics

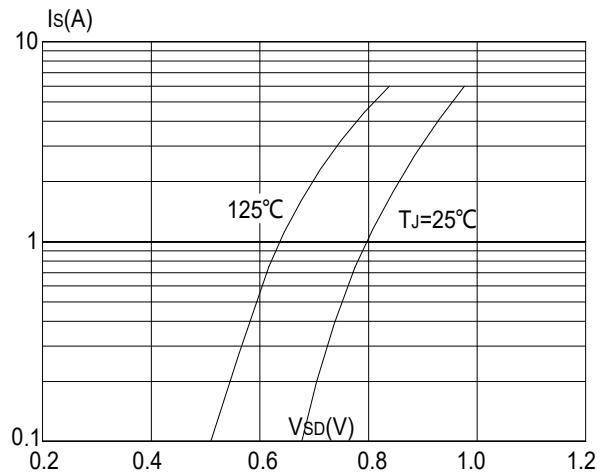


Figure 6: Capacitance Characteristics

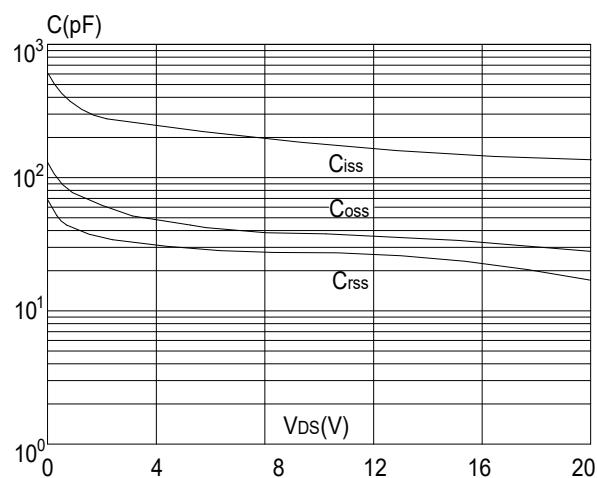




Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

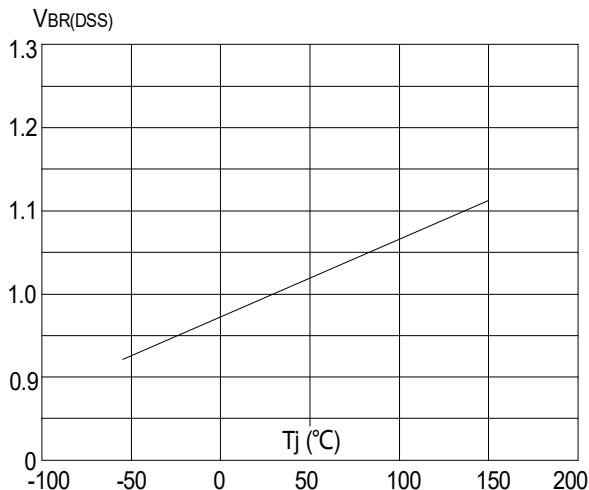


Figure 8: Normalized on Resistance vs. Junction Temperature

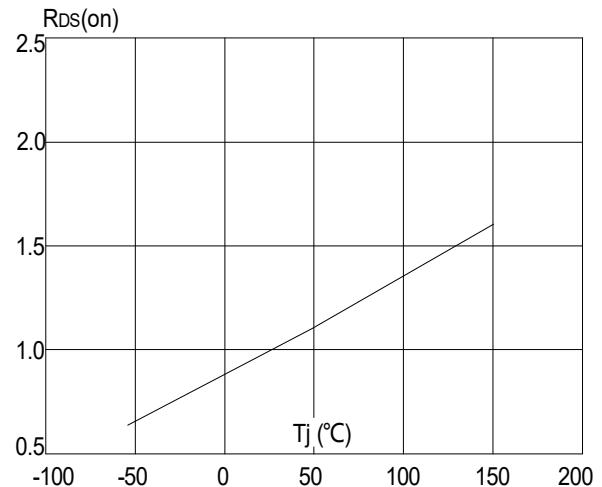


Figure 9: Maximum Safe Operating Area

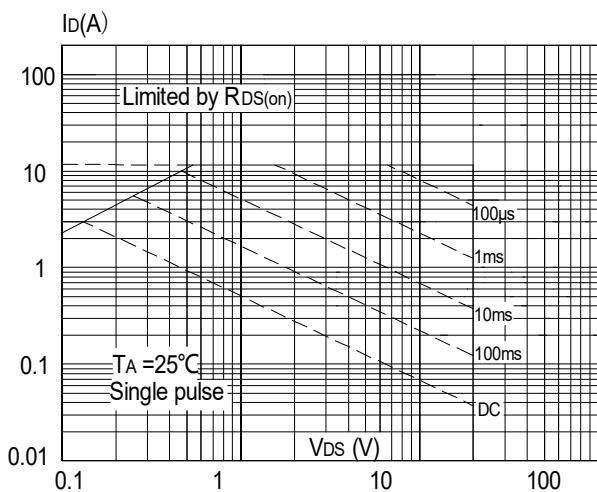


Figure 10: Maximum Continuous Drain Current vs. Ambient Temperature

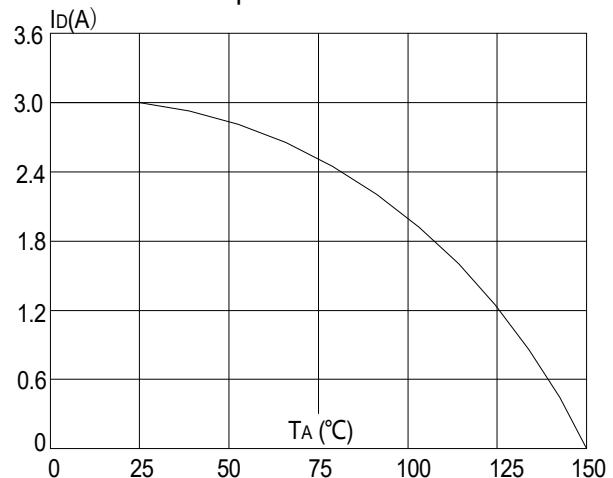
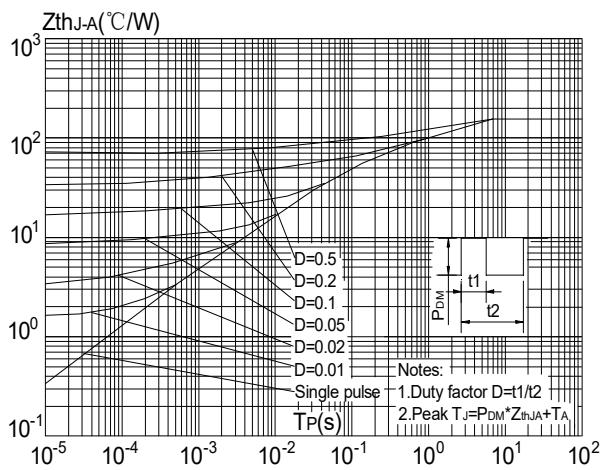
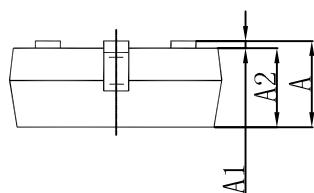
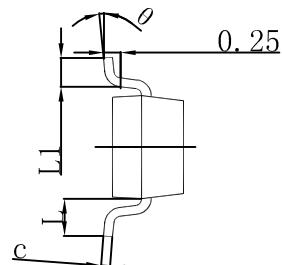
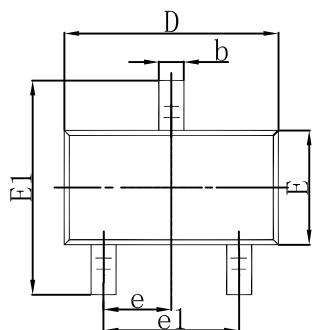


Figure 11: Maximum Effective Transient Thermal Impedance, Junction-to-Ambient



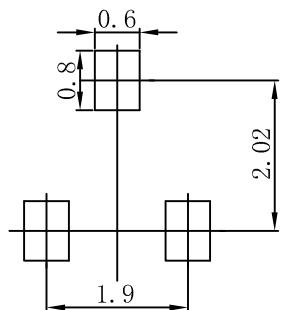


SOT-23 Package Outline Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP		0.037 TYP	
e1	1.800	2.000	0.071	0.079
L	0.550 REF		0.022 REF	
L1	0.300	0.500	0.012	0.020
θ	0°	8°	0°	8°

SOT-23 Suggested Pad Layout



Note:

1. Controlling dimension: in millimeters.
2. General tolerance: ± 0.05 mm.
3. The pad layout is for reference purposes only.



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