

NH1300P03E



P-Channel Enhancement Mode Trench Power MOSFET

Voltage: -30 Volts

Current: -0.4 Ampers

Package: SOT-23

Features

- NH'S Advanced Trench Technology
- Low Rds(on) For Low On-State Loss
- High EAS For High Reliability
- Excellent Qg*Rds(on) Product(FOM)
- Built-in ESD Protected

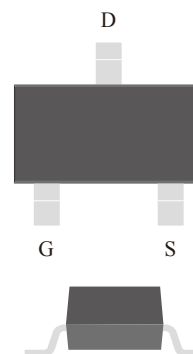
Typical Applications

- DC-DC Converter
- Battery Management System(BMS)
- Printed Circuit Board For Control Circuit
- Uninterruptible Power Supplies(UPS)

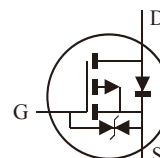
Product Summary

VDS Min.@Tj	-30	V
Id Min.@Ta	-0.4	A
RDS(ON)(TYP)@-4.5V	1300	mΩ

Diagram:



Polarity:



***100% UIS TESTED**

***100% ΔVDS TESTED**

Absolute Maximum Ratings (Ta=25°C Unless Otherwise Specified)

Parameter	Test Conditions	Symbol	Ratings	Unit
Drain-Source Voltage		V _{DS}	-30	V
Gate-Source Voltage		V _{GS}	±10	V
Continuous Drain Current (Note 1)	Ta= 25 °C	I _D	-0.4	A
	Ta= 100 °C		-0.2	
Drain Current-Pulse (Note 1)	Tj< 150 °C	I _{DM}	-1	A
Maximum Power Dissipation Power	Ta= 25 °C	P _D	362	mW
Dissipation Derating Factor Above 25°C	Ta= 100 °C		145	
Derating Factor		D _F	2.9	mW/°C

Thermal Characteristics (Ta=25°C Unless Otherwise Specified)

Parameter	Test Conditions	Symbol	Typ.	Unit
Junction Temperature		T _J	-55 to 150	°C
Storage Temperature Range		T _{STD}	-55 to 150	°C
Thermal Resistance Junction To Ambient With Steady-State	Still Air Environment With Ta=25°C	R _{θJA}	345	°C/W

Notes: 1.Pulse Width Limited By Max. Junction Temperature. (See Fig. 12).

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Electrical Characteristics (Ta=25°C Unless Otherwise Specified)

Parameter	Test Conditions	Symbol	Min.	Typ.	Max.	Unit
Static Off Characteristics						
Drain-Source Breakdown Voltage	VGS=0V,ID=-250uA	BV _{DSS}	-30	--	--	V
Bvdss Temperature Coefficient	ID=-250uA,Reference25℃	ΔBV _{DSS} /ΔT _J	--	0.03	--	V/℃
Drain-Source Leakage Current	VDS= -24 V,VGS=0V	I _{DSS}	--	--	-1	uA
Gate-Body Leakage Current	VGS= ±10 V,VDS=0V	I _{GSS}	--	--	±100	nA
Static On Characteristics						
Gate Threshold Voltage	VGS= VDS ID=-250uA	V _{GS(TH)}	-0.5	-1	-1.5	V
Drain-Source On Resistance	ID= -0.2 A,VGS= -4.5 V	R _{DS(ON)}	--	1300	1560	mΩ
	ID= -0.2 A,VGS= -2.5 V		--	2002	2496	
Dynamic Characteristics						
Input Capacitance	VDS= -24 V	C _{iss}	--	40	--	pF
Output Capacitance	VGS= 0 V	C _{oss}	--	10	--	pF
Reverse Transfer Capacitance	F= 1 MHZ	C _{rss}	--	6	--	pF
Switching Paramters (Test Circuit & Waveform See Fig.14)						
Turn-On Delay Time	VDS= -24 V	t _{d(on)}	--	13	--	ns
Turn-On Rise Time	VGS= -4.5 V	t _r	--	10	--	ns
Turn-Off Delay Time	RG= 10.0 Ω	t _{d(off)}	--	21	--	ns
Turn-Off Rise Time		t _f	--	16	--	ns
Gate Charge Paramters (Test Circuit & Waveform See Fig.15)						
Total Gate Charge	VDS= -24 V	Q _g	--	1.1	--	nC
Gate-Source Charge	VGS= -4.5 V	Q _{gs}	--	0.6	--	nC
Gate-Drain Charge	ID= -0.2 A	Q _{gd}	--	0.4	--	nC
Drain-Source Diode Characteristics And Maximum Ratings (Test Circuit & Waveform See Fig.17)						
Max. Diode Forward Cuurent		I _s	--	--	-0.4	A
Max. Pulsed Forward Cuurent		I _{SM}	--	--	-1.5	A
Diode Forward Voltage	ID= -0.4 A,VGS=0V	V _{SD}	--	-0.8	-1.2	V

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Typical Characteristics Curves

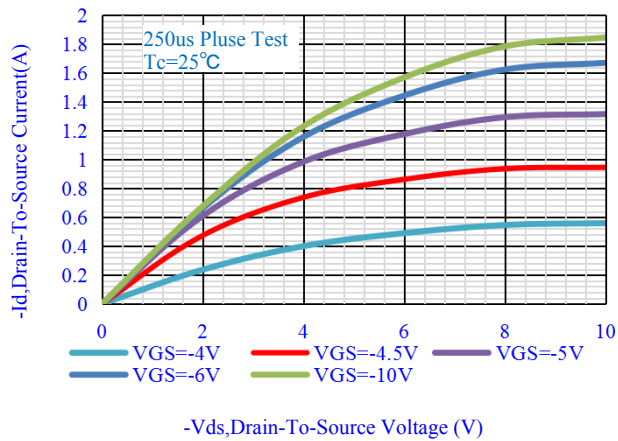


Fig.1-Output Characteristics

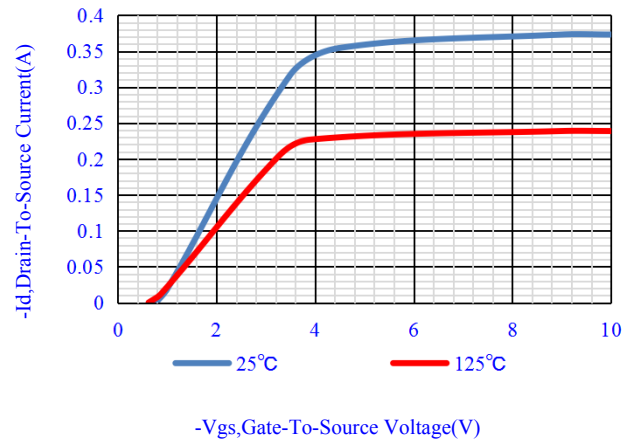


Fig.2-Transfer Characteristics

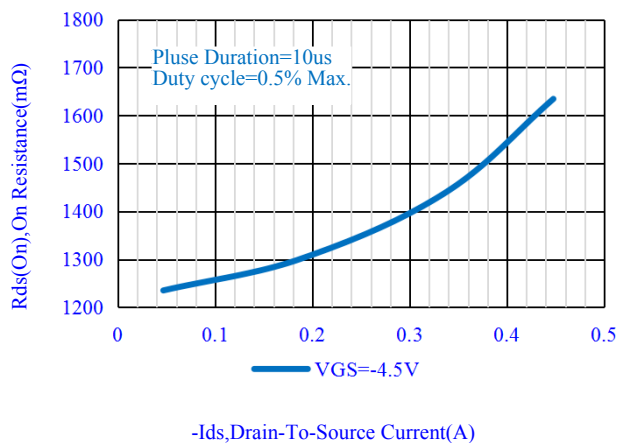


Fig.3-On Resistance Vs. Drain Current

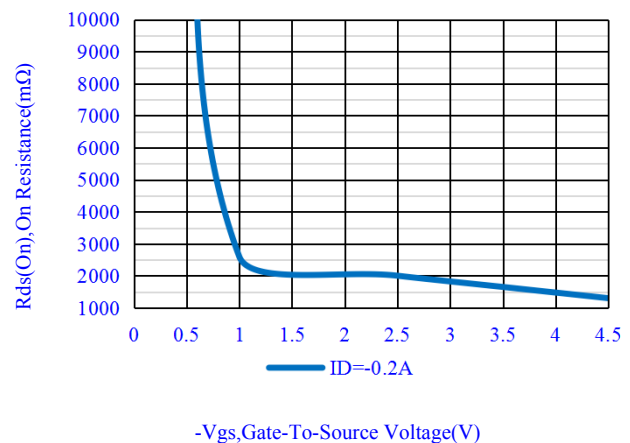


Fig.4-On Resistance Vs. Gate Source Voltage

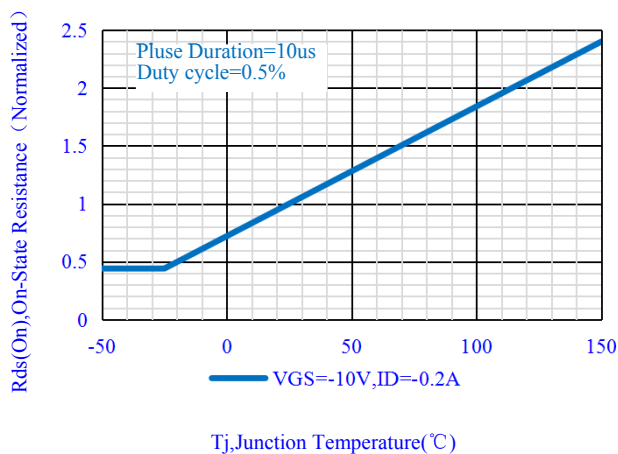


Fig.5-On Resistance Vs. Junction Temperature

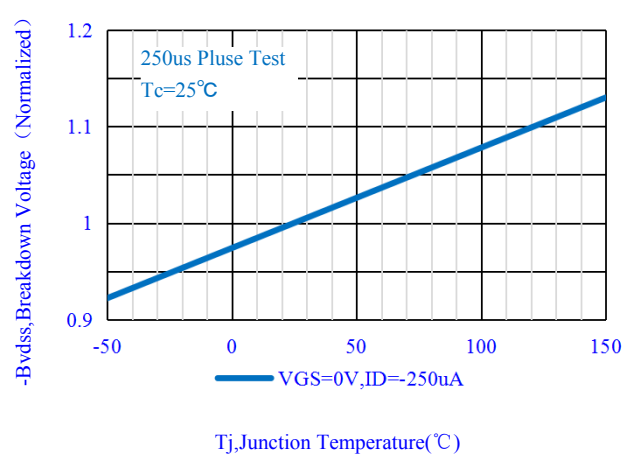


Fig.6-Breakdown Voltage Vs. Junction Temperature

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Typical Characteristics Curves

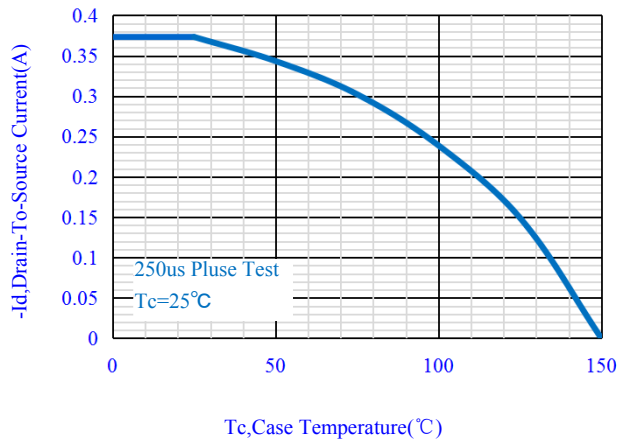


Fig.7-Maximum Continuous Drain Current Vs. Case Temperature

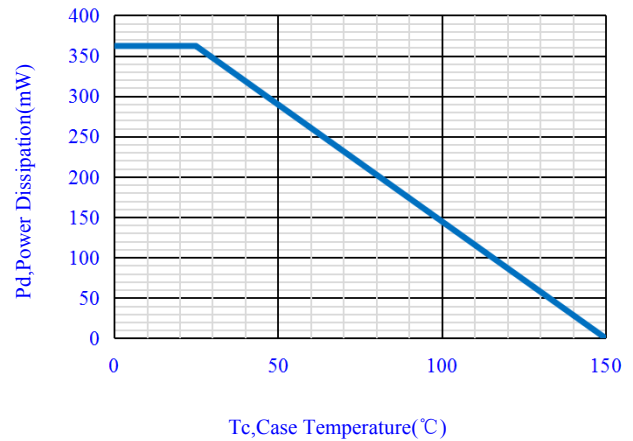


Fig.8-Maximum Power Dissipation Vs. Case Temperature

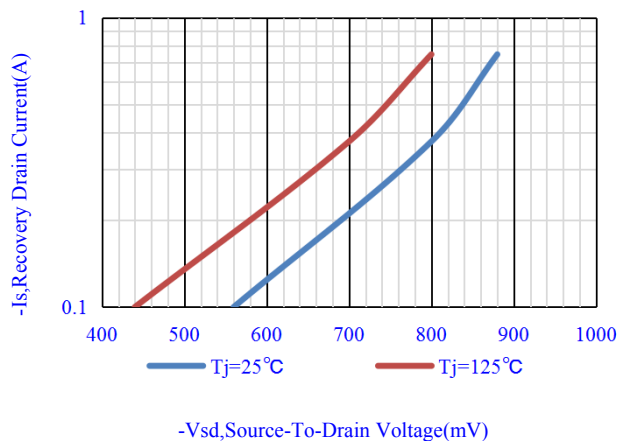


Fig.9-Source-To-Drain Diode Forward Voltage

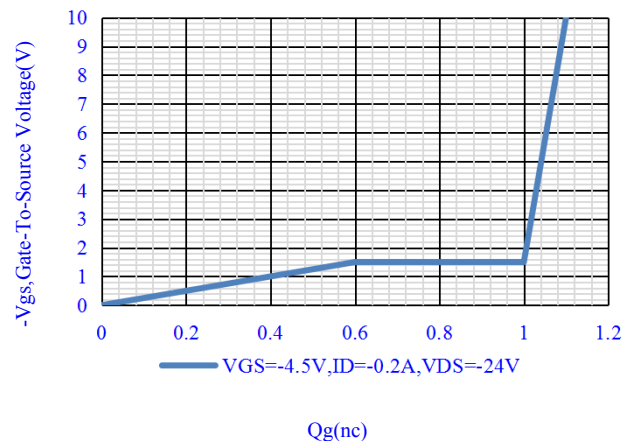


Fig.10-Gate Charge Waveform

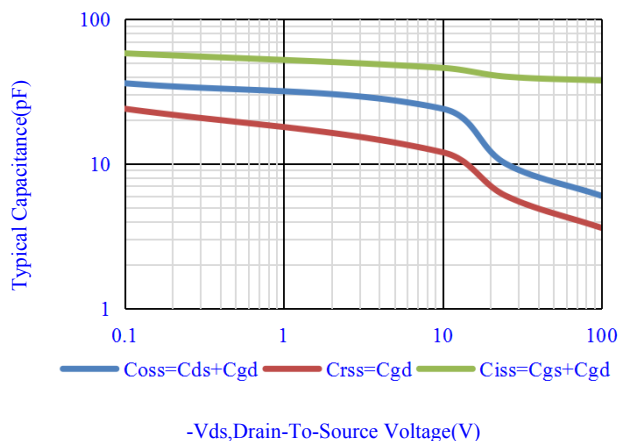


Fig.11-Typical Capacitance Vs. Drain-To-Source Voltage

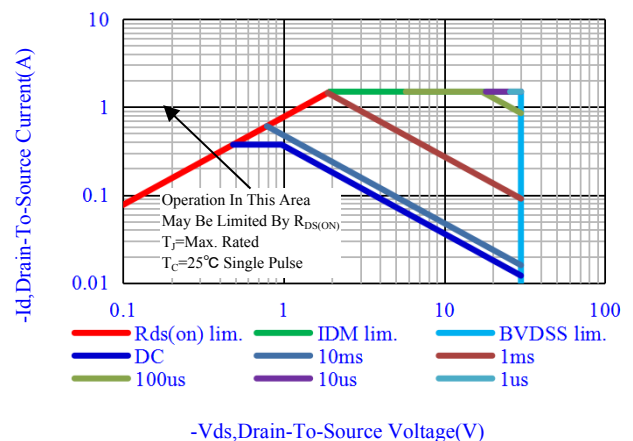


Fig.12-Maximum Safe Operating Area(SOA)

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Typical Characteristics Curves

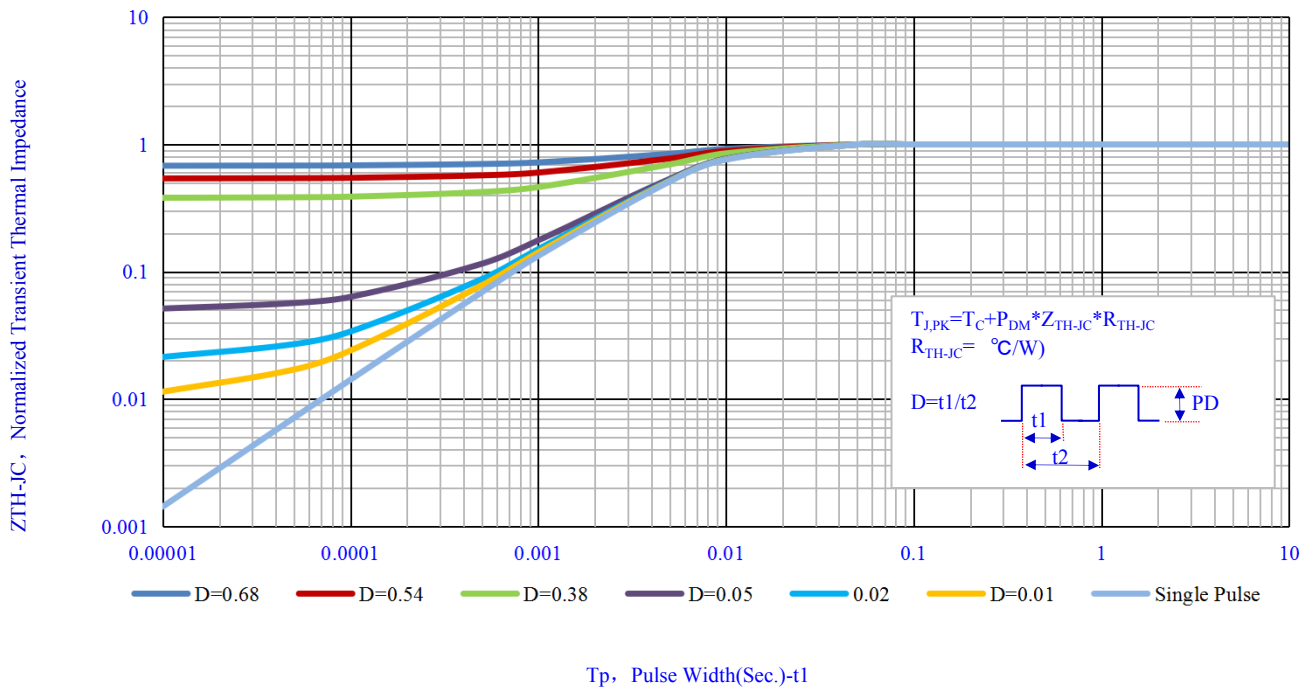


Fig.12- Normalized Maximum Transient Thermal Impedance Vs.Pulse Width

Test Circuit & Waveform

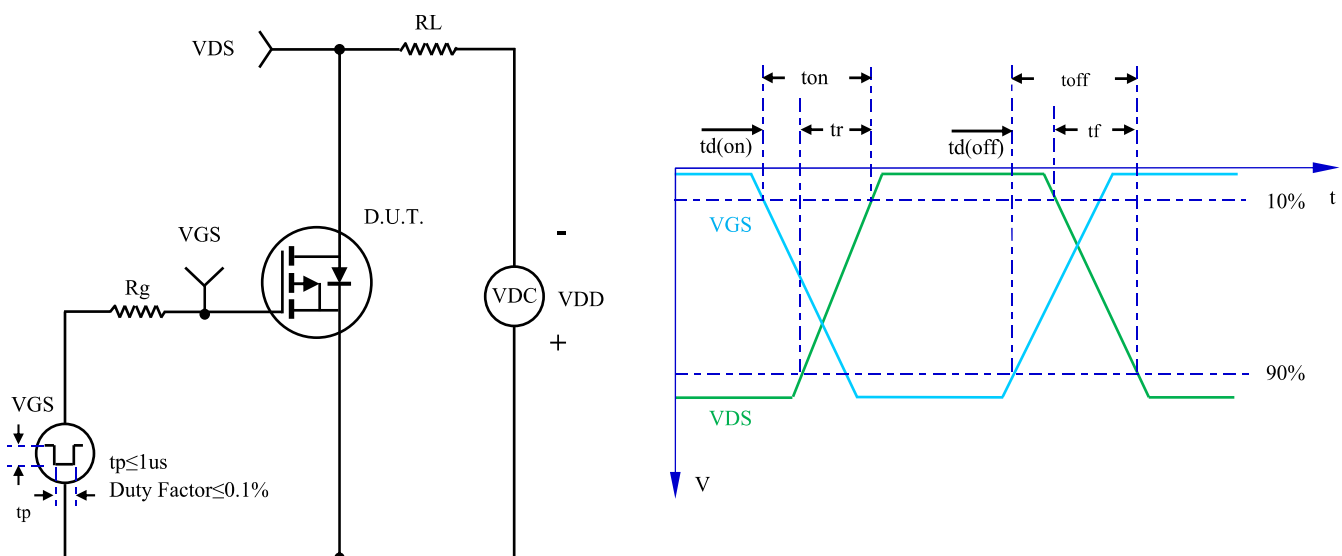


Fig.13- Resistive Switching Test Circuit & Waveform