

100V N-Channel SGT Enhancement Mode MOSFET

Description

The NP1045G uses Shield Gate Trench technology that is uniquely optimized to provide the most efficient high frequency switching performance. Both conduction and switching power losses are minimized due to an extremely low combination of $R_{DS(ON)}$ and Q_g . This device is ideal for high-frequency switching and synchronous rectification.

General Features

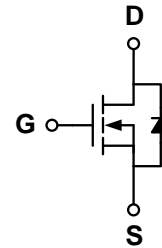
- ◆ $V_{DS} = 100V$ $I_D = 45A$
 $R_{DS(ON)}(Typ.) = 14.0m\Omega$ @ $V_{GS} = 10V$
 $R_{DS(ON)}(Typ.) = 18.5m\Omega$ @ $V_{GS} = 4.5V$
- ◆ Excellent gate charge x $R_{DS(on)}$ product(FOM)
- ◆ Very low on-resistance $R_{DS(on)}$
- ◆ 150 °C operating temperature
- ◆ 100% UIS tested

100% UIS TESTED!
100% ΔV_{ds} TESTED!

Application

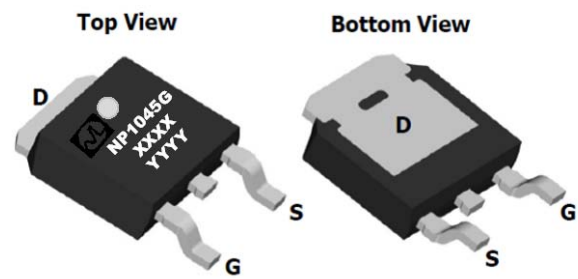
- ◆ Synchronous Rectification in DC/DC and AC/DC Converters
- ◆ Industrial and Motor Drive applications

Schematic diagram



Marking and pin assignment

TO-252-2L



Note:

XXXX—Wafer Information

YYYY—Quality Code



Ordering Information

Part Number	Storage Temperature	Package	Devices Per Reel
NP1045G-G	-55°C to +150°C	TO-252-2L	2500

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

parameter	symbol	limit	unit
Drain-source voltage	V_{DS}	100	V
Gate-source voltage	V_{GS}	±20	V
Continuous Drain Current	I_D	TC=25°C	45
		TC=70°C	36
Pulsed Drain Current	I_{DP}	180	A
Avalanche energy(L=0.5mH) ^(note1)	E_{AS}	200	mJ
Power Dissipation	P_D	TC=25°C	85
		TC=70°C	45
Operating junction Temperature range	T_j	-55—150	°C

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

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Static Characteristics						
Drain-source breakdown voltage	BV _{DSS}	V _{GS} =0V, I _D =250μA	100	-	-	V
Zero gate voltage drain current	I _{DSS}	V _{DS} =100V, V _{GS} =0V	-	-	1	μA
		T _J =55°C	-	-	5	
Gate Leakage Current	I _{GSS}	V _{DS} =0V, V _{GS} =±20V	-	-	±100	nA
Gate threshold voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	1.0	1.75	2.5	V
Drain-source on-state resistance ¹	R _{DS(ON)}	V _{GS} =10V, I _D =45A	-	14.0	18	mΩ
		V _{GS} =4.5V, I _D =30A	-	18.5	24	
Forward Transconductance	g _{FS}	V _{DS} =5V, I _D =20A	-	35	-	S
Diode Characteristics						
Diode Forward Voltage	V _{SD}	I _{SD} =1A, V _{GS} =0V	-	0.7	1.2	V
Diode Continuous Forward Current	I _S		-	-	60	A
Reverse Recovery Time	t _{rr}	T _J = 25°C, I _F =45A di/dt = 100A/μs	-	25	-	ns
Reverse Recovery Charge	Q _{rr}		-	80	-	nC
Dynamic Characteristics²						
Gate Resistance	R _G	V _{GS} =0V, V _{DS} =0V, f=1MHz	-	1.2	1.8	Ω
Input capacitance	C _{ISS}	V _{GS} =0V, V _{DS} =50V f=1.0MHz	-	1600	-	pF
Output capacitance	C _{OSS}		-	140	-	
Reverse transfer capacitance	C _{RSS}		-	11	-	
Turn-on delay time	t _{D(ON)}	V _{GS} =10V, V _{DS} =50V, R _L =2.5Ω, R _G =3Ω	-	6	-	ns
Turn-on Rise time	t _r		-	2	-	
Turn-off delay time	t _{D(OFF)}		-	18	-	
Turn-off Fall time	t _f		-	2	-	
Total gate charge	Q _g	V _{GS} =10V, V _{DS} =50V, I _D =20A	-	26	-	nC
Gate-source charge	Q _{gs}		-	7.4	-	
Gate-drain charge	Q _{gd}		-	3.8	-	

Note: 1: Pulse test; pulse width ≤ 300ns, duty cycle ≤ 2%.

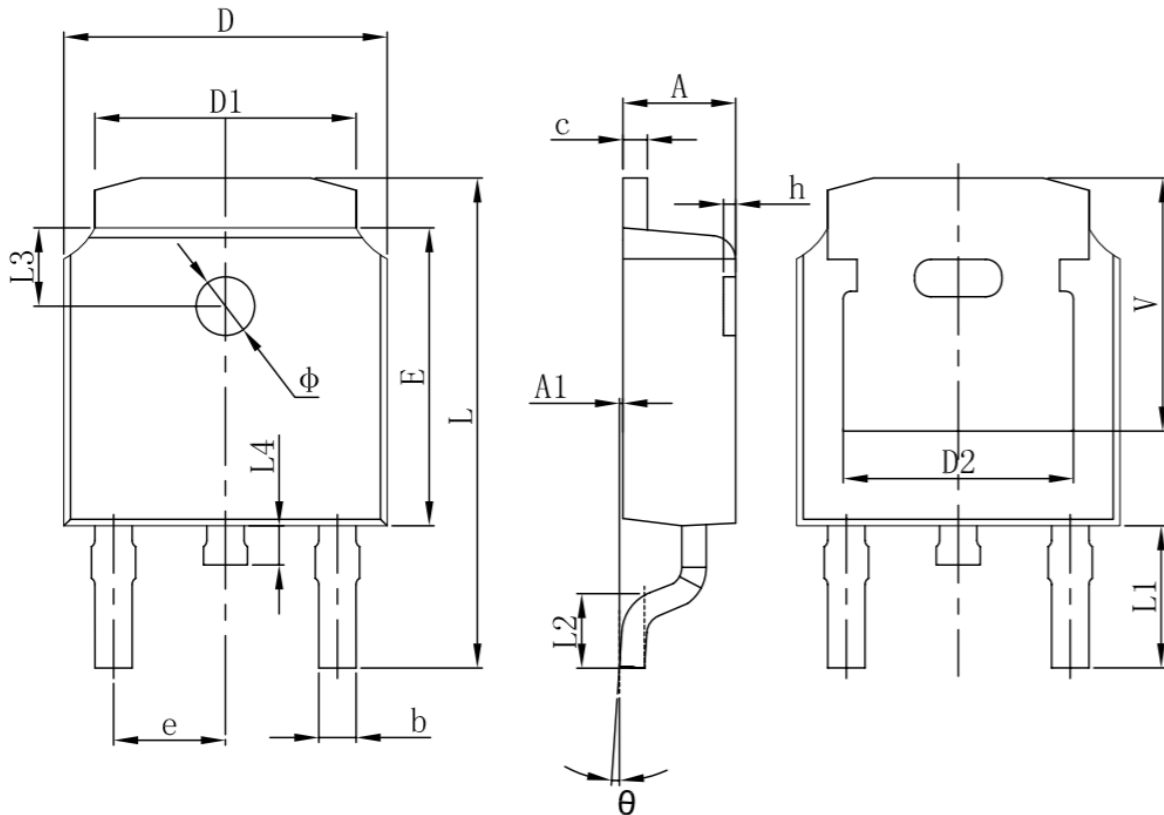
2: Guaranteed by design, not subject to production testing.

Thermal Characteristics

Parameter	Symbol	Typical	Unit
Thermal Resistance-Junction to Case	R _{θJC}	1.7	°C/W
Thermal Resistance junction-to ambient	R _{θJA}	62.5	

Package Information

- TO-252-2L



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.200	2.400	0.087	0.094
A1	0.000	0.127	0.000	0.005
b	0.635	0.770	0.025	0.030
c	0.460	0.580	0.018	0.023
D	6.500	6.700	0.256	0.264
D1	5.100	5.460	0.201	0.215
D2	4.830 REF.		0.190 REF.	
E	6.000	6.200	0.236	0.244
e	2.186	2.386	0.086	0.094
L	9.712	10.312	0.382	0.406
L1	2.900 REF.		0.114 REF.	
L2	1.400	1.700	0.055	0.067
L3	1.600 REF.		0.063 REF.	
L4	0.600	1.000	0.024	0.039
Φ	1.100	1.300	0.043	0.051
θ	0°	8°	0°	8°
h	0.000	0.300	0.000	0.012
V	5.250 REF.		0.207 REF.	