NIC5004TS1, NIC5004ATS1

Self-Protected FET with Temperature and Current Limit

40 V, 6.5 A, Single N−Channel

Self−protected FETs are a series of power MOSFETs which utilize ON Semiconductor HDPlus™ technology. The self−protected MOSFET incorporates protection features such as integrated thermal and current limits. The self−protected MOSFETs include an integrated Drain−to−Gate Clamp that provides overvoltage protection from transients and avalanche. The device is protected from Electrostatic Discharge (ESD) by utilizing an integrated Gate−to−Source Clamp.

MOSFET MAXIMUM RATINGS (T_J = 25°C unless otherwise noted)

Rating	Symbol	Value	Unit
Drain−to−Source Voltage Internally Clamped	V_{DSS}	44	Vdc
Gate−to−Source Voltage	V_{GS}	±14	Vdc
Drain Current Continuous	I_D	Internally Limited	
Operating and Storage Temperature Range (Note 1)	T_J, T_{stg}	−55 to 150	°C
Electrostatic Discharge Capability Human Body Model (HBM) Machine Model (MM)	ESD	 >4000 >400	V

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

1. Normal pre−fault operating range.

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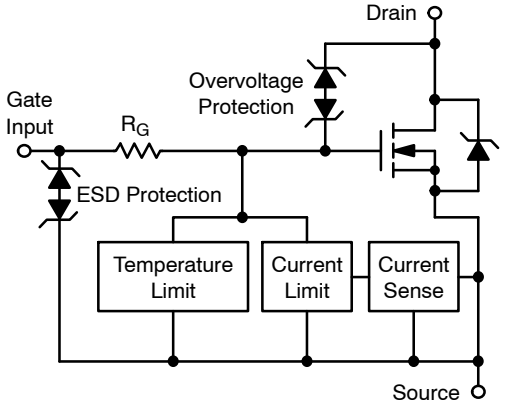
V_{DSS} (Clamped)	$R_{DS(on)}$ Typ	I_D Typ (Limited)
40 V	110 mΩ @ 10 V	6.5 A



ORDERING INFORMATION

See detailed ordering and shipping information in the package dimensions section on page 2 of this data sheet.

MOSFET ELECTRICAL CHARACTERISTICS (T_J = 25°C unless otherwise noted) (Note 2)

Characteristic	Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS					
Drain−to−Source Clamped Breakdown Voltage (V_{GS} = 0 V, I_D = 2 mA)	$V_{(BR)DSS}$	36	40	44	V
Zero Gate Voltage Drain Current (V_{DS} = 32 V, V_{GS} = 0 V)	I_{DSS}	–	27	100	μA
Gate Input Current (V_{GS} = 5.0 V, V_{DS} = 0 V)	I_{GSS}	–	45	200	μA
ON CHARACTERISTICS					
Gate Threshold Voltage (V_{DS} = V_{GS}, I_D = 150 μA)	$V_{GS(th)}$	1.0	1.85	2.2	V
Static Drain−to−Source On−Resistance (V_{GS} = 10 V, I_D = 2.0 A)	$R_{DS(on)}$	–	110	130	mΩ
Static Drain−to−Source On−Resistance (V_{GS} = 5.0 V, I_D = 2.0 A)	$R_{DS(on)}$	–	130	150	mΩ
Source−Drain Forward On Voltage (I_S = 7.0 A, V_{GS} = 0 V)	V_{SD}	–	0.9	1.1	V

SELF PROTECTION CHARACTERISTICS (T_J = 25°C unless otherwise noted)

Current Limit	V_{DS} = 10 V, V_{GS} = 5.0 V, T_J = 25°C V_{DS} = 10 V, V_{GS} = 5.0 V, T_J = 100°C V_{DS} = 10 V, V_{GS} = 10 V, T_J = 25°C	I_{LIM}	– – –	6.5 5.5 7.9	– – –	A

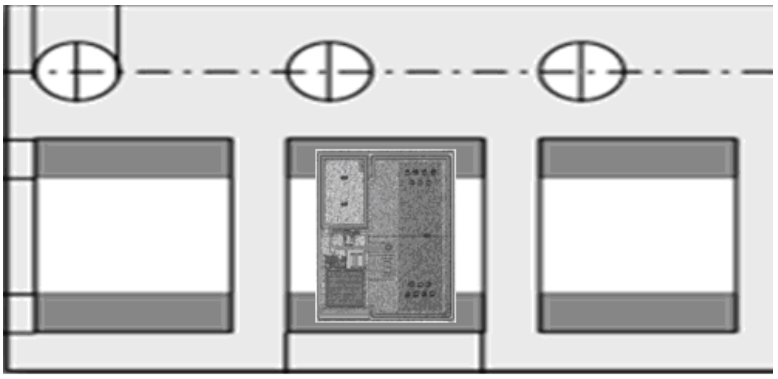
2. Wafers tested prior to sawing.

ORDERING INFORMATION

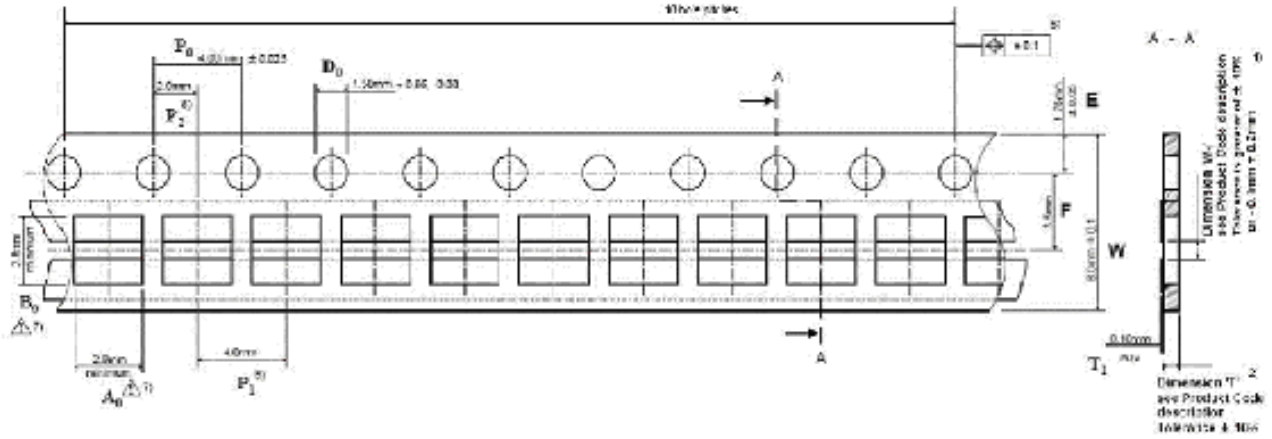
Device	Package	Shipping†
NIC5004TS1	Die−in−Reel Carrier	3500 / Reel
NIC5004ATS1	Die−in−Reel Carrier	3500 / Reel

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

LAYOUT VIEW OF THE DIE IN REEL



Option B



W_1 = 0.7 + 0.2 – 0.1 mm
T = 0.7 mm +/- 0.07 mm
Drawing according to ISO 8015 General tolerances ± 0.05mm

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PUBLICATION ORDERING INFORMATION

LITERATURE FULFILLMENT:
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