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NVATS68301PZ

Power MOSFET

–100 V, 75 mΩ, –31 A, P-Channel



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The NVATS68301PZ is a power MOSFET designed for compact size and high efficiency which can achieve high thermal performance. AEC-Q101 qualified MOSFET and PPAP capable suitable for automotive applications.

Features

- Low On-Resistance
- High Current Capability
- 100% Avalanche Tested
- AEC-Q101 qualified and PPAP capable
- ATPAK package is pin-compatible with DPAK (TO-252)
- Pb-Free, Halogen Free and RoHS compliance

Typical Applications

- Reverse Battery Protection
- Load Switch
- Automotive Front Lighting
- Automotive Body Controllers

SPECIFICATIONS

ABSOLUTE MAXIMUM RATING at Ta = 25°C (Note 1)

Parameter	Symbol	Value	Unit
Drain to Source Voltage	V _{DSS}	–100	V
Gate to Source Voltage	V _{GSS}	±20	V
Drain Current (DC)	I _D	–31	A
Drain Current (Pulse) PW ≤ 10 μs, duty cycle ≤ 1%	I _{DP}	–124	A
Power Dissipation Tc=25°C	P _D	84	W
Operating Junction and Storage Temperature	T _j , T _{stg}	–55 to +175	°C
Avalanche Energy (Single Pulse) (Note 2)	E _{AS}	54	mJ
Avalanche Current (Note 3)	I _{AV}	–28	A

Note 1 : Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

2 : V_{DD} = –30 V, L = 100 μH, I_{AV} = –28 A (Fig.1)

3 : L ≤ 100 μH, Single pulse

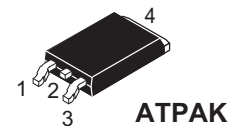
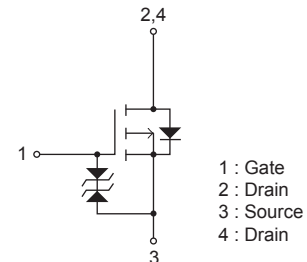
THERMAL RESISTANCE RATINGS

Parameter	Symbol	Value	Unit
Junction to Case Steady State (Tc = 25°C)	R _{θJC}	1.78	°C/W
Junction to Ambient (Note 4)	R _{θJA}	79.3	°C/W

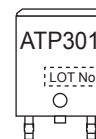
Note 4 : Surface mounted on FR4 board using a 130 mm², 1 oz. Cu pad

V _{DSS}	R _{DS(on)} Max	I _D Max
–100 V	75 mΩ @ –10 V	–31 A

ELECTRICAL CONNECTION P-Channel



MARKING



ORDERING INFORMATION

See detailed ordering and shipping information on page 6 of this data sheet.

ELECTRICAL CHARACTERISTICS at Ta = 25°C (Note 5)

Parameter	Symbol	Conditions	Value			Unit
			min	typ	max	
Drain to Source Breakdown Voltage	V(BR)DSS	ID = -1 mA, VGS = 0 V	-100			V
Zero-Gate Voltage Drain Current	IDSS	VDS = -100 V, VGS = 0 V			-1	μA
Gate to Source Leakage Current	IGSS	VGS = ±16 V, VDS = 0 V			±10	μA
Gate Threshold Voltage	VGS(th)	VDS = -10 V, ID = -1 mA	-2.0		-3.5	V
Forward Transconductance	gFS	VDS = -10 V, ID = -14 A		29		S
Static Drain to Source On-State Resistance	RDS(on)	ID = -14 A, VGS = -10 V		57	75	mΩ
Input Capacitance	Ciss	VDS = -20 V, f = 1 MHz		2,850		pF
Output Capacitance	Coss			270		pF
Reverse Transfer Capacitance	Crss			125		pF
Turn-ON Delay Time	td(on)	See Fig.2		26		ns
Rise Time	tr			150		ns
Turn-OFF Delay Time	td(off)			250		ns
Fall Time	tf			170		ns
Total Gate Charge	Qg		VDS = -60 V, VGS = -10 V, ID = -28 A		55	
Gate to Source Charge	Qgs			10		nC
Gate to Drain "Miller" Charge	Qgd			17		nC
Forward Diode Voltage	VSD	IS = -28 A, VGS = 0 V		-0.88	-1.5	V

Note 5 : Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

Fig.1 Unclamped Inductive Switching Test Circuit

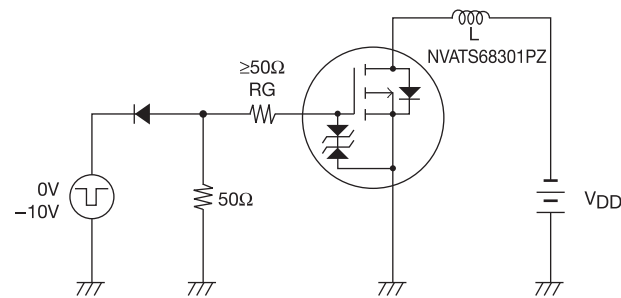
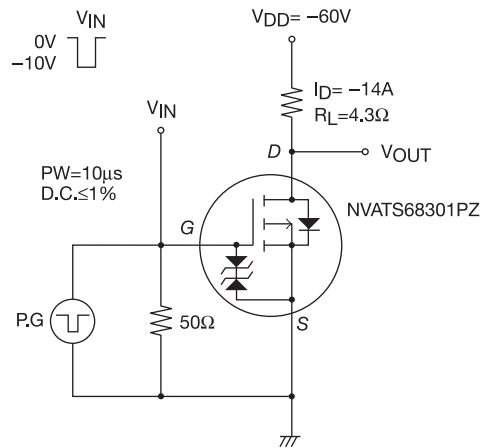
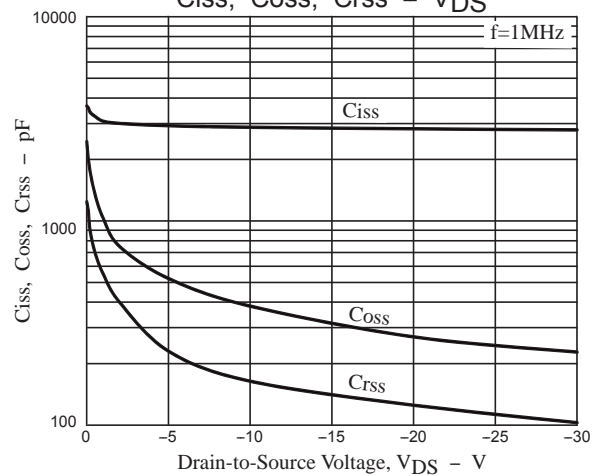
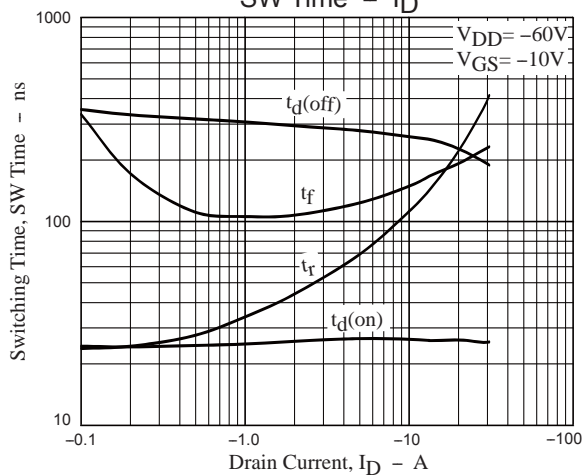
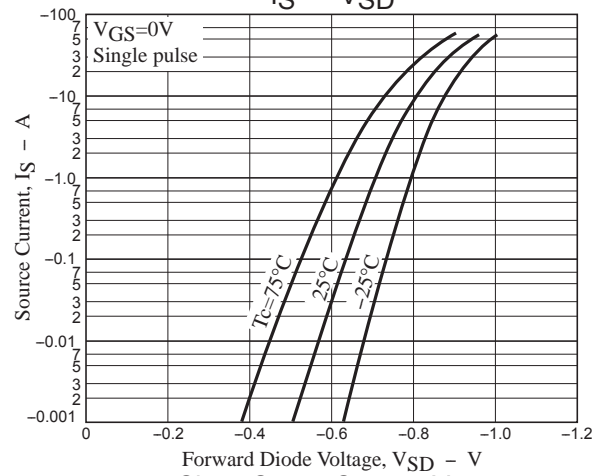
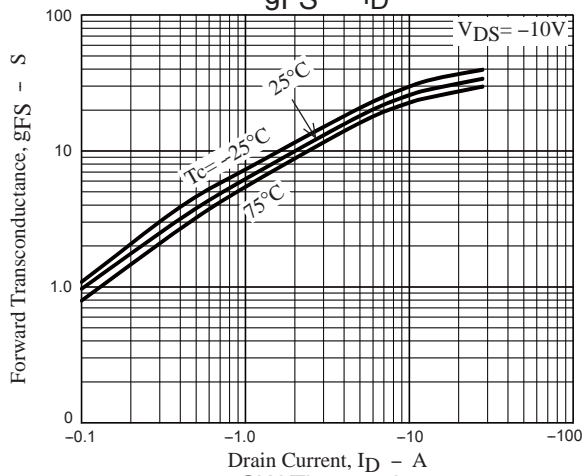
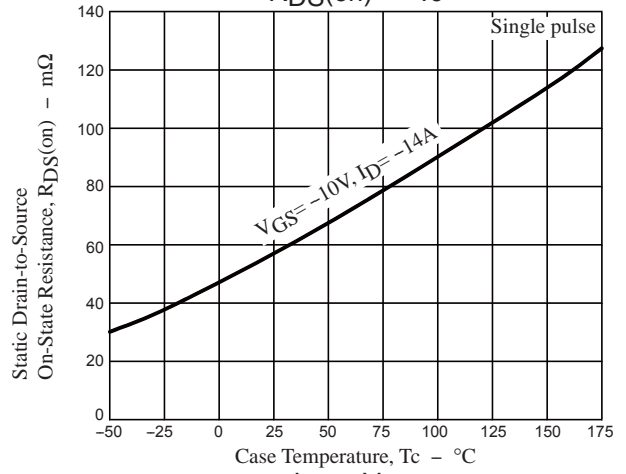
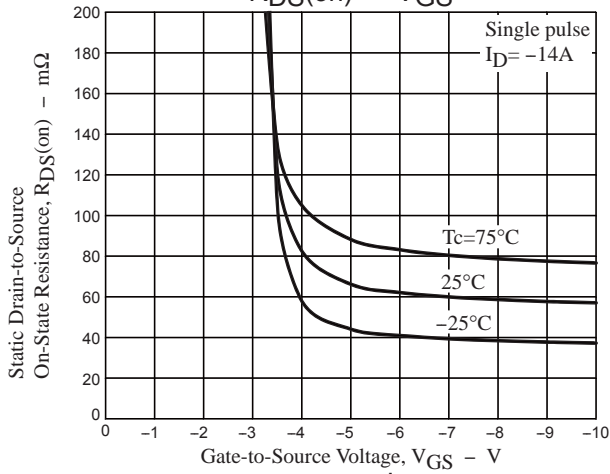
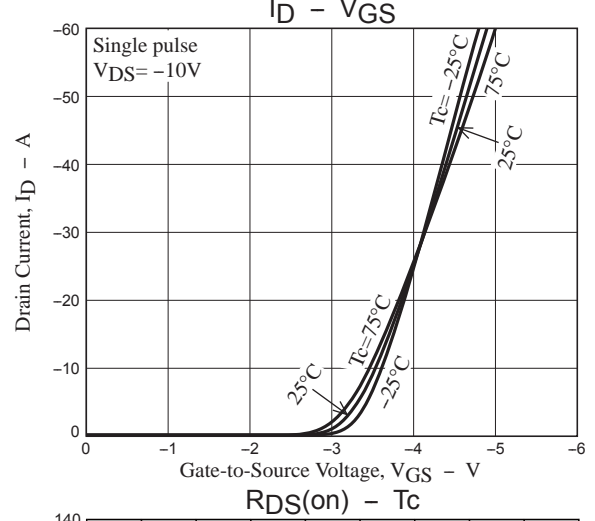
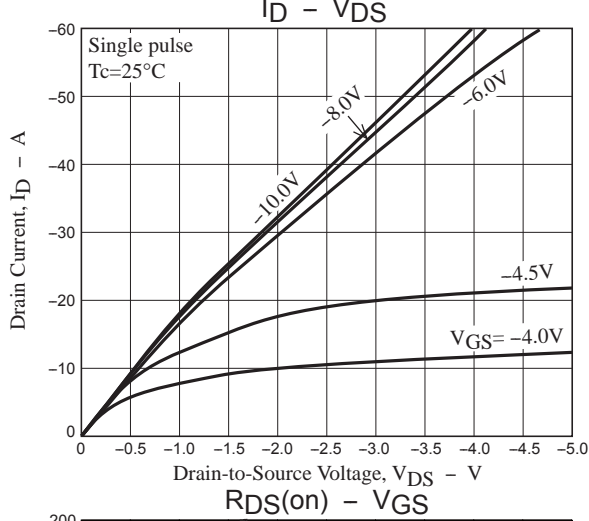
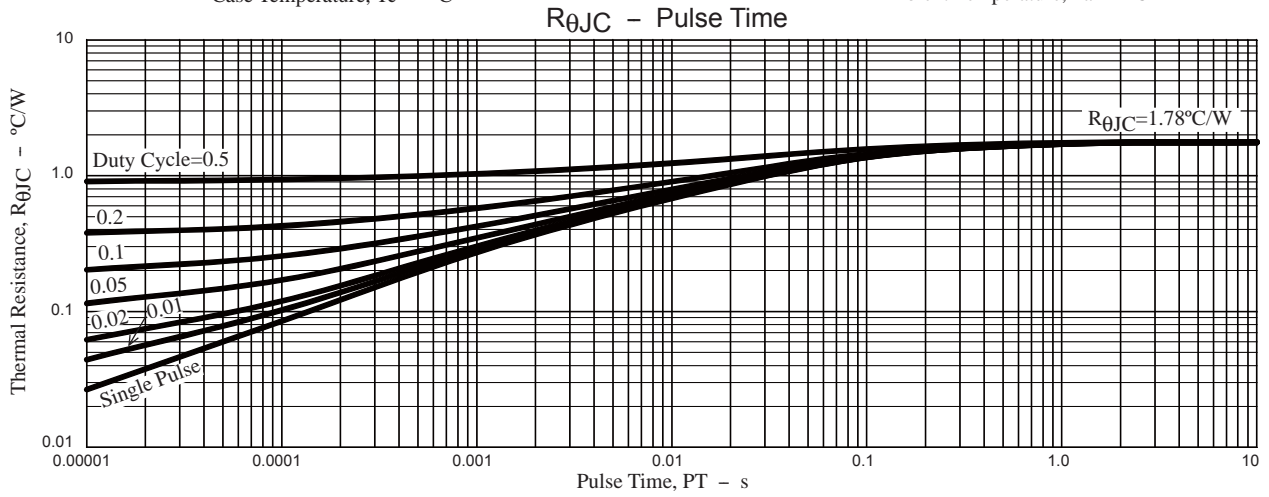
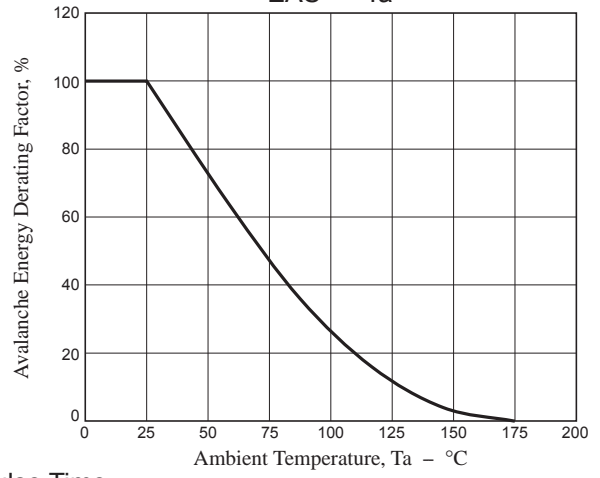
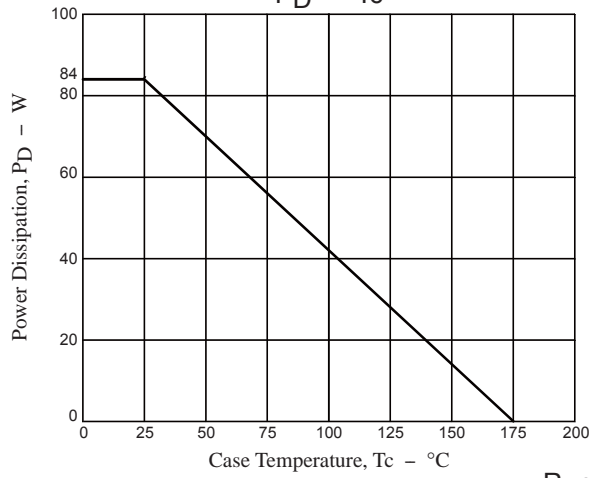
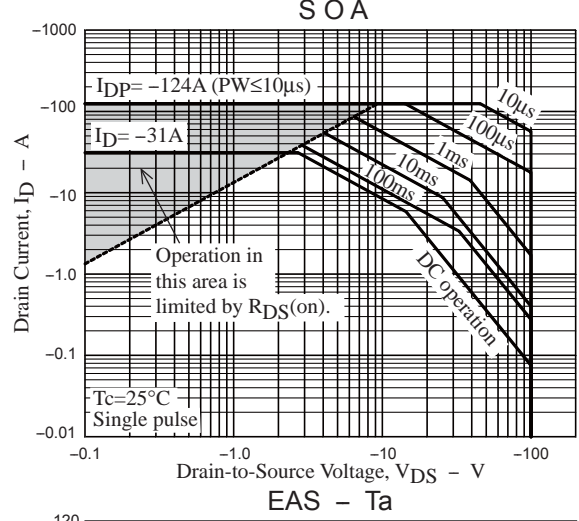
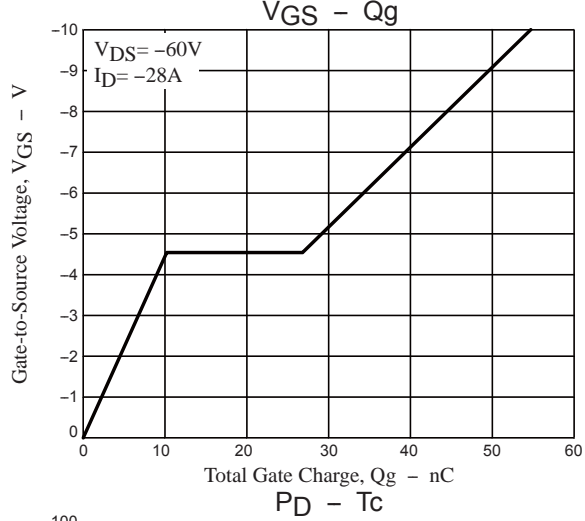


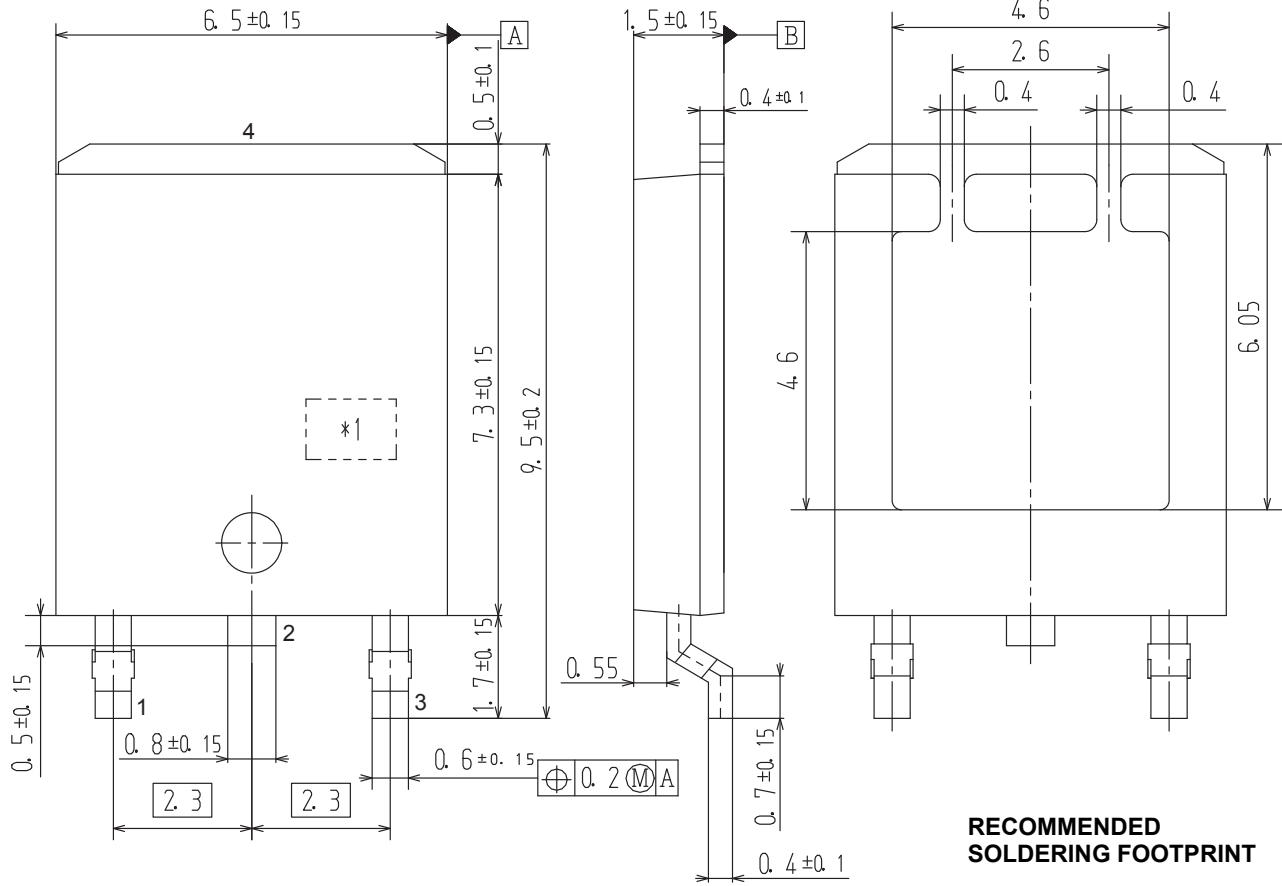
Fig.2 Switching Time Test Circuit



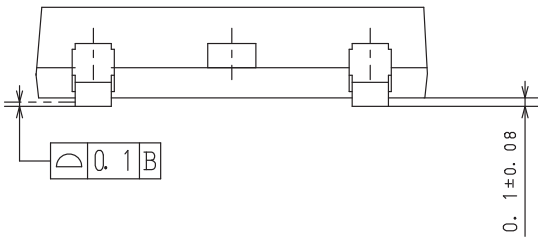




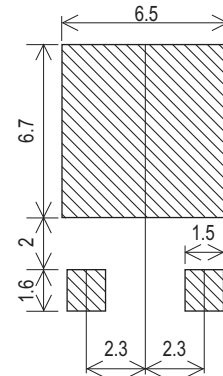
DPAK (Single Gauge) / ATPAK
 CASE 369AM
 ISSUE O



**RECOMMENDED
 SOLDERING FOOTPRINT**



- 1 : Gate
- 2 : Drain
- 3 : Source
- 4 : Drain



Pin2 is idle pin with electrical designation only carried

*1: Lot indication

ORDERING INFORMATION

Device	Marking	Package	Shipping (Qty / Packing)
NVATS68301PZT4G	ATP301	DPAK(Single Gauge) / ATPAK (Pb-Free / Halogen Free)	3,000 / Tape & 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. http://www.onsemi.com/pub_link/Collateral/BRD8011-D.PDF

Note on usage : Since the NVATS68301PZ is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

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