ON Semiconductor

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Power MOSFET -60 V, 13 mΩ, -80 A, P-Channel

Automotive Power MOSFET designed for compact and efficient designs and including high thermal performance.

 $AEC\mbox{-}Q101$ qualified MOSFET and PPAP capable suitable for automotive applications.



- 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)

V _{DSS} V _{GSS} I _D	-60 ±20 -80	> >
	_	-
lD	-80	Α
IDP	-320	Α
PD	84	W
Tj, Tstg	-55 to +175	ô
Eas	197	mJ
lΑV	-42	Α
P Tj	D j, Tstg AS	D 84 j, Tstg -55 to +175 AS 197

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.

- $2:V_{\mbox{\footnotesize{DD}}}$ = -36 V, L = 100 $\mu\mbox{H},$ IAV = -42 A (Fig.1)
- 3 : L ≤ 100 μ H, Single pulse

THERMAL RESISTANCE RATINGS

Parameter	Symbol	Value	Unit		
Junction to Case Steady State (Tc = 25°C)	R ₀ JC	1.78	°C/W		
Junction to Ambient (Note 4)	R_{θ} JA	79.1	°C/W		

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

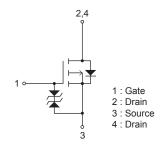


ON Semiconductor®

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VDSS	R _{DS} (on) Max	ID Max
-60 V	13 mΩ @ –10 V	00.4
	18 mΩ @ –4.5 V	–80 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)

Development	0	O and difference	Value			1.1
Parameter	Symbol	Conditions	min	typ	max	Unit
Drain to Source Breakdown Voltage	V(BR)DSS	I _D = -1 mA, V _{GS} = 0 V	-60			V
Zero-Gate Voltage Drain Current	IDSS	V _{DS} = -60 V, V _{GS} = 0 V			-10	μΑ
Gate to Source Leakage Current	IGSS	V _{GS} = ±16 V, V _{DS} = 0 V			±10	μА
Gate Threshold Voltage	VGS(th)	V _{DS} = -10 V, I _D = -1 mA	-1.2		-2.6	V
Forward Transconductance	gFS	V _{DS} = -10 V, I _D = -35 A		75		S
Static Drain to Source On-State Resistance	R _{DS} (on)1	I _D = -35 A, V _{GS} = -10 V		10	13	mΩ
	R _{DS} (on)2	I _D = -35 A, V _{GS} = -4.5 V		13	18	mΩ
Input Capacitance	Ciss			5,400		pF
Output Capacitance	Coss	V _{DS} = -20 V, f = 1 MHz		500		pF
Reverse Transfer Capacitance	Crss			370		pF
Turn-ON Delay Time	t _d (on)			35		ns
Rise Time	t _r	San Fire 2		430		ns
Turn-OFF Delay Time	t _d (off)	See Fig.2		420		ns
Fall Time	tf			500		ns
Total Gate Charge	Qg			115		nC
Gate to Source Charge	Qgs	$V_{DS} = -36 \text{ V}, V_{GS} = -10 \text{ V}, I_{D} = -70 \text{ A}$		20		nC
Gate to Drain "Miller" Charge	Qgd			25		nC
Forward Diode Voltage	V _{SD}	I _S = -70 A, V _{GS} = 0 V		-1.0	-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

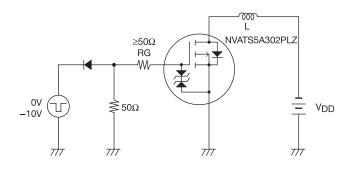
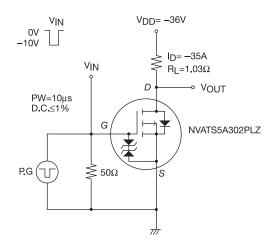
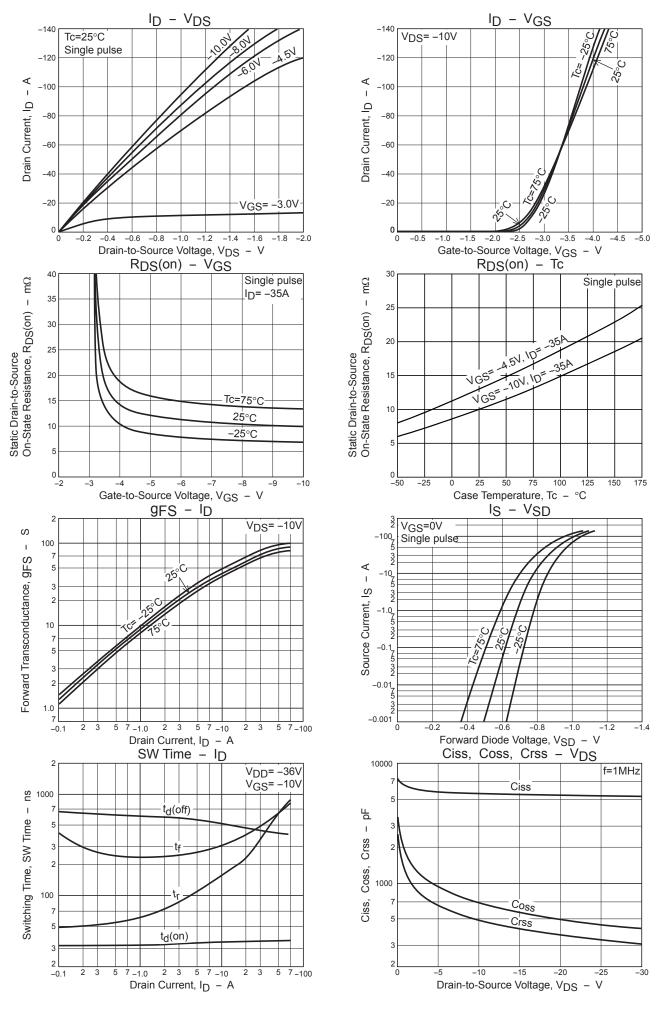
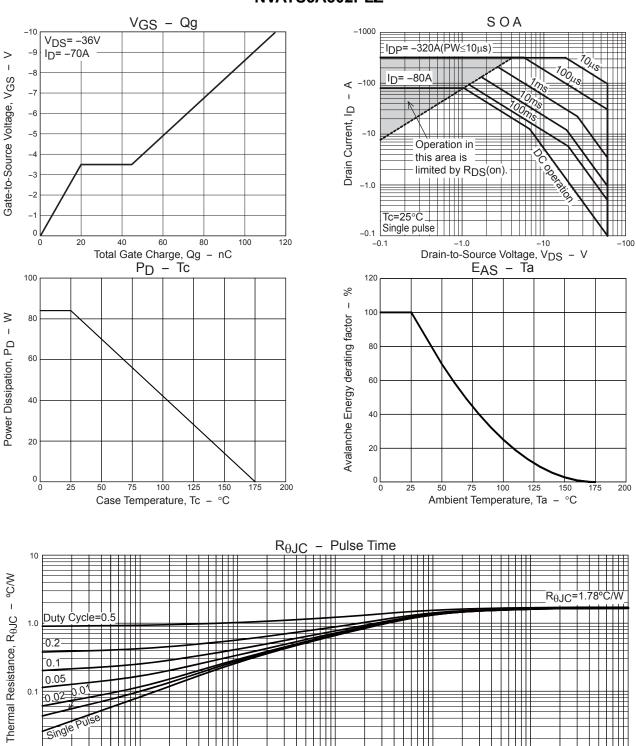


Fig.2 Switching Time Test Circuit







0.01

Pulse Time, PT - s

1.0

0.1

0.001

0.0001

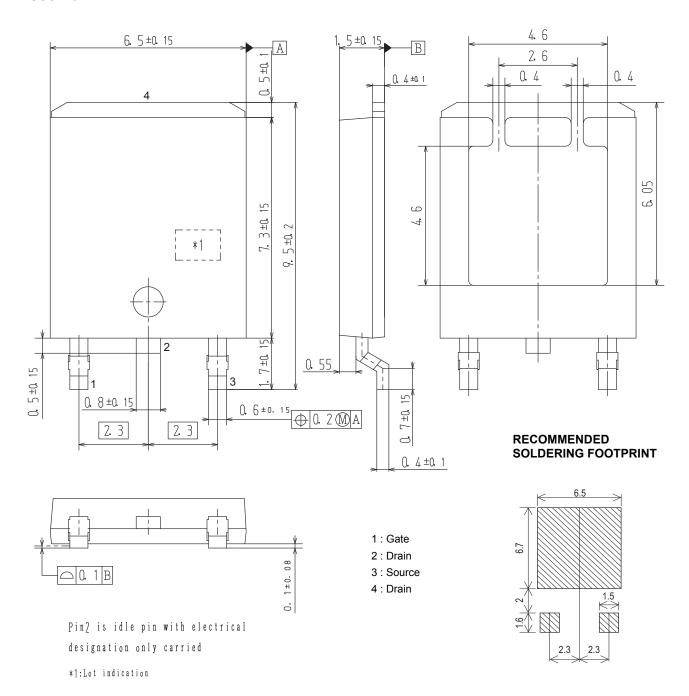
0.01

PACKAGE DIMENSIONS

unit: mm

DPAK (Single Gauge) / ATPAK

CASE 369AM ISSUE O



ORDERING INFORMATION

Device	Marking	Package	Shipping (Qty / Packing)
NVATS5A302PLZT4G	ATP302	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 NVATS5A302PLZ is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

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