

MOSFET – Power, P-Channel

-60 V, 6.5 mΩ, -100 A

ATP304

Features

- ON-Resistance $R_{DS(on)1} = 5.0 \text{ m}\Omega$ (typ)
- Input Capacitance $C_{iss} = 13000 \text{ pF}$ (typ)
- 4.5 V Drive
- This Device is Pb-Free, Halogen Free and RoHS Compliant

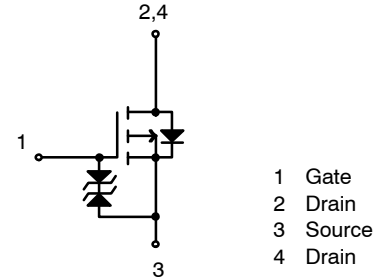
MAXIMUM RATINGS (Ta = 25°C) (Note 1)

Parameter	Symbol	Value	Unit
Drain-to-Source Voltage	V_{DS}	-60	V
Gate-to-Source Voltage	V_{GS}	± 20	V
Drain Current (DC)	I_D	-100	A
Drain Current (Pulse) PW ≤ 10 μs, duty cycle ≤ 1%	I_{DP}	-400	A
Allowable Power Dissipation Tc = 25°C	P_D	90	W
Channel Temperature	T_{ch}	150	°C
Storage Temperature	T_{stg}	-55 to +150	°C
Avalanche Energy (Single Pulse) (Note 1)	E_{AS}	656	mJ
Avalanche Current (Note 2)	I_{AV}	-75	A

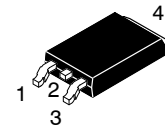
Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

- $V_{DD} = -36 \text{ V}$, $L = 100 \text{ }\mu\text{H}$, $I_{AV} = -75 \text{ A}$ (Figure 1)
- $L \leq 100 \text{ }\mu\text{H}$, Single pulse

V_{DS}	$R_{DS(on)} \text{ MAX}$	$I_D \text{ MAX}$
-60 V	6.5 mΩ @ -10 V	-100 A
	8.9 mΩ @ -4.5 V	

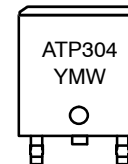


ELECTRICAL CONNECTION P-CHANNEL



DPAK-4
CASE 369AM

MARKING DIAGRAM



ATP304 = Specific Device Code
Y = Year of Production
M = Assembly Operation Month
W = Work Week in the Month

ORDERING INFORMATION

See detailed ordering, marking and shipping information in the package dimensions section on page 5 of this data sheet.

ATP304

ELECTRICAL CHARACTERISTICS (T_J = 25°C unless otherwise specified)

Parameter	Symbol	Test Condition	Value			Unit
			Min	Typ	Max	
Drain to Source Breakdown Voltage	V _{(BR)DSS}	I _D = -1 mA, V _{GS} = 0 V	-60	-	-	V
Zero-Gate Voltage Drain Current	I _{DSS}	V _{DS} = -60 V, V _{GS} = 0 V	-	-	-10	μA
Gate to Source Leakage Current	I _{GSS}	V _{GS} = +16 V, V _{DS} = 0 V	-	-	+10	μA
Cutoff Voltage	V _{GS(off)}	V _{DS} = -10 V, I _D = -1 mA	-1.2	-	-2.6	V
Forward Transfer Admittance	y _{fs}	V _{DS} = -10 V, I _D = -50 A	-	100	-	S
Static Drain to Source On-State Resistance	R _{DS(on)1}	I _D = -50 A, V _{GS} = -10 V	-	5.0	6.5	mΩ
	R _{DS(on)2}	I _D = -50 A, V _{GS} = -4.5 V	-	6.4	8.9	mΩ
Input Capacitance	C _{iss}	V _{DS} = -20 V, f = 1 MHz	-	13000	-	pF
Output Capacitance	C _{oss}		-	1080	-	pF
Reverse Transfer Capacitance	C _{rss}		-	760	-	pF
Turn-ON Delay Time	t _{d(on)}	(Figure 2)	-	80	-	ns
Rise Time	t _r		-	650	-	ns
Turn-OFF Delay Time	t _{d(off)}		-	780	-	ns
Fall Time	t _f		-	460	-	ns
Total Gate Charge	Q _g	V _{DS} = -36 V, V _{GS} = -10 V, I _D = -100 A	-	250	-	nC
Gate to Source Charge	Q _{gs}		-	55	-	nC
Gate to Drain "Miller" Charge	Q _{gd}		-	50	-	nC
Diode Forward Voltage	V _{SD}	I _S = -100 A, V _{GS} = 0 V	-	-1.0	-1.5	V
Reverse Recovery Time	t _{rr}	(Figure 3)	-	90	-	ns
Reverse Recovery Charge	Q _{rr}	I _S = -100 A, V _{GS} = 0 V, di/dt = -100 A / μs	-	245	-	nC

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.

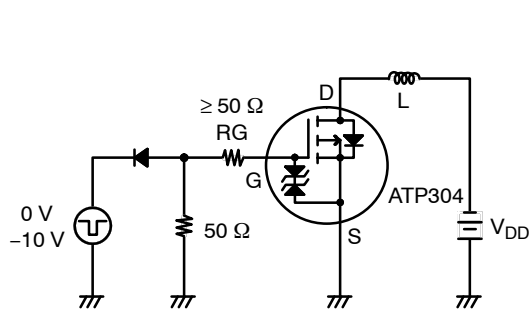


Figure 1. Unclamped Inductive Switching Test Circuit

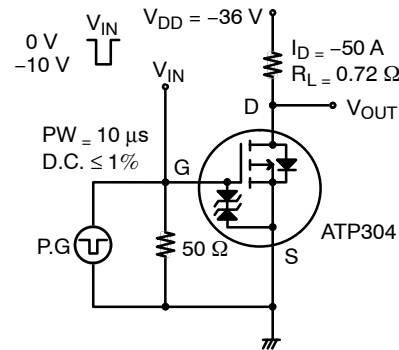


Figure 2. Switching Time Test Circuit

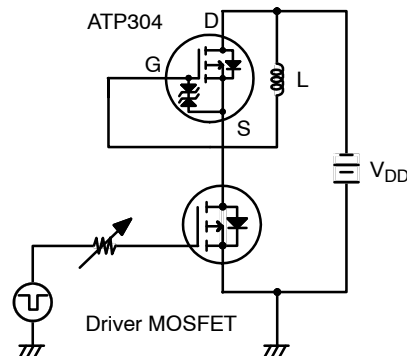


Figure 3. Reverse Recovery Time Test Circuit

TYPICAL CHARACTERISTICS

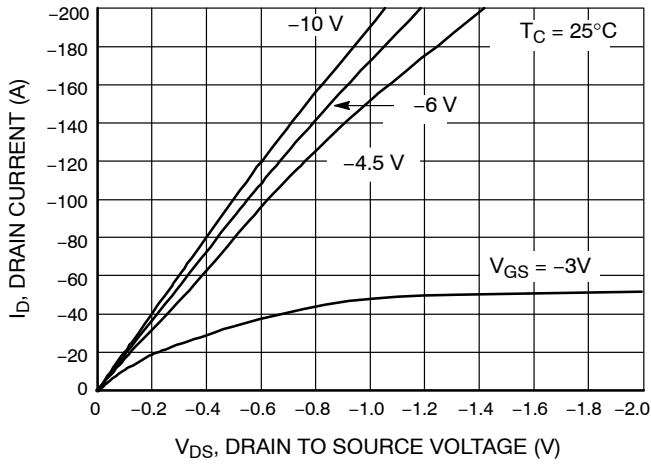


Figure 4. $I_D - V_{DS}$

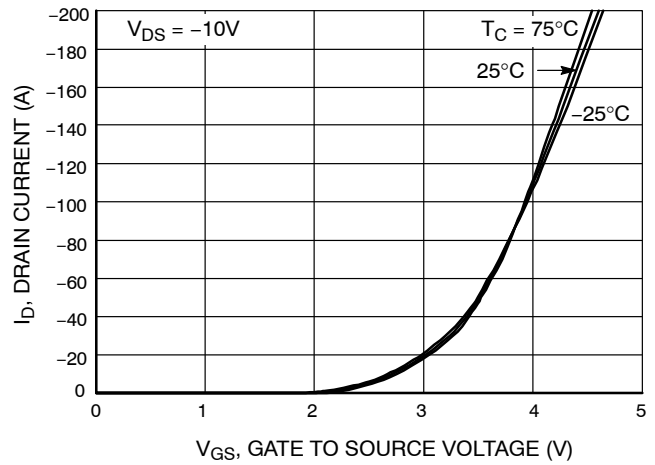


Figure 5. $I_D - V_{GS}$ (off)

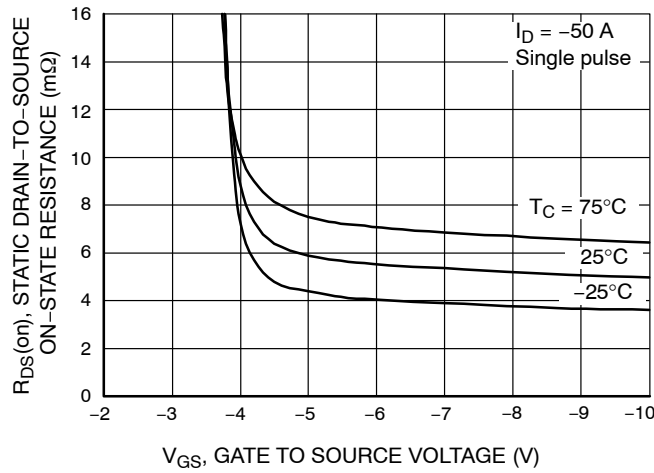


Figure 6. $R_{DS(on)} - V_{GS}$

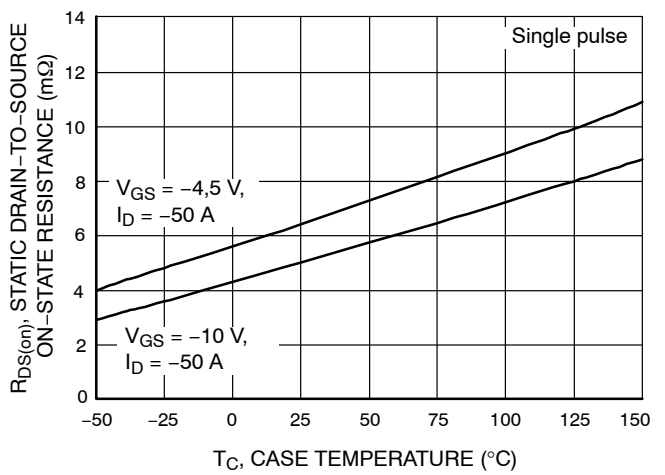


Figure 7. $R_{DS(on)} - T_C$

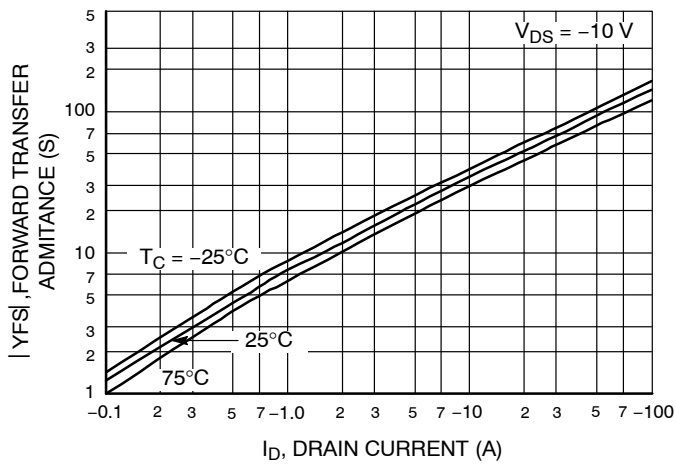


Figure 8. $|y_{fs}| - I_D$

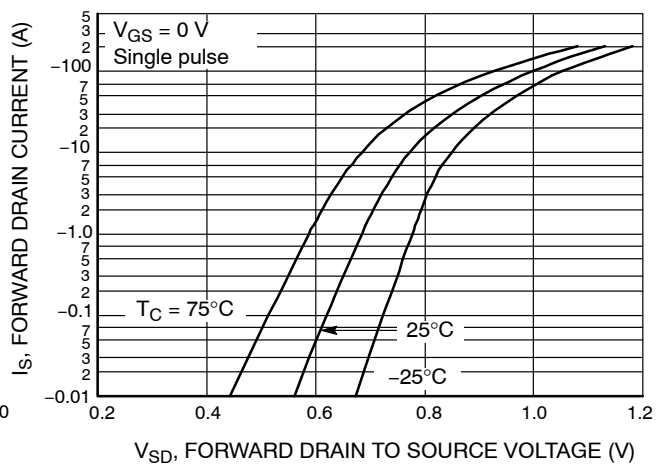


Figure 9. $I_S - V_{SD}$

TYPICAL CHARACTERISTICS (CONTINUED)

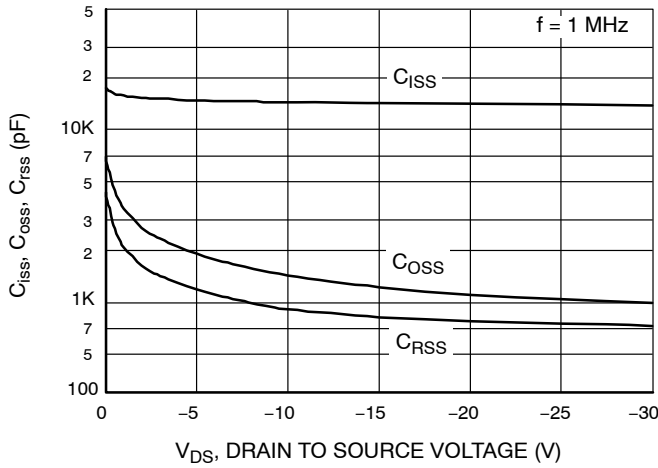


Figure 10. C_{iss} , C_{oss} , C_{rss} - V_{DS}

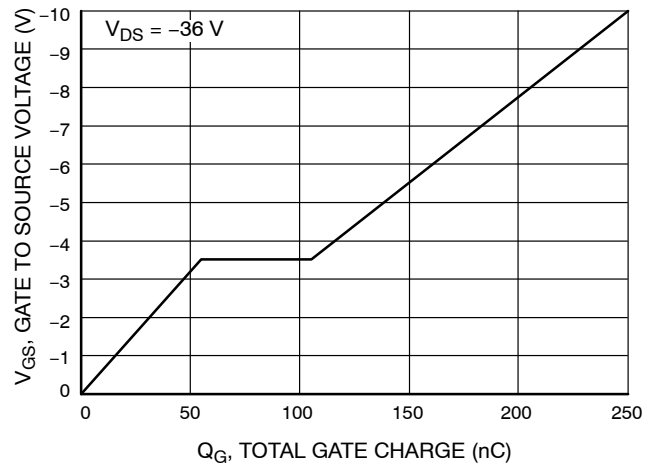


Figure 11. Q_g - V_{GS}

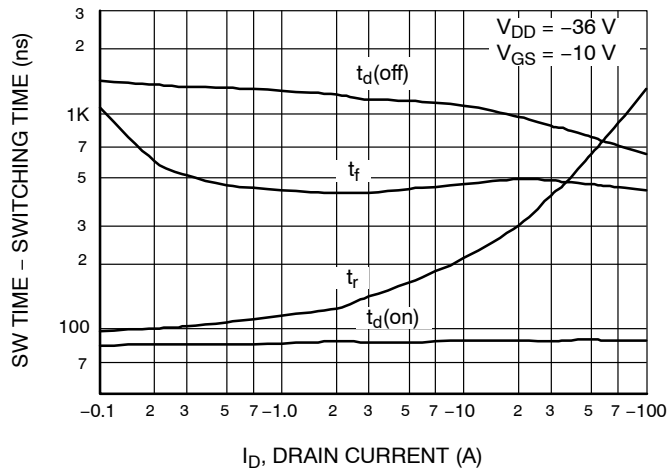


Figure 12. SW Time - I_D

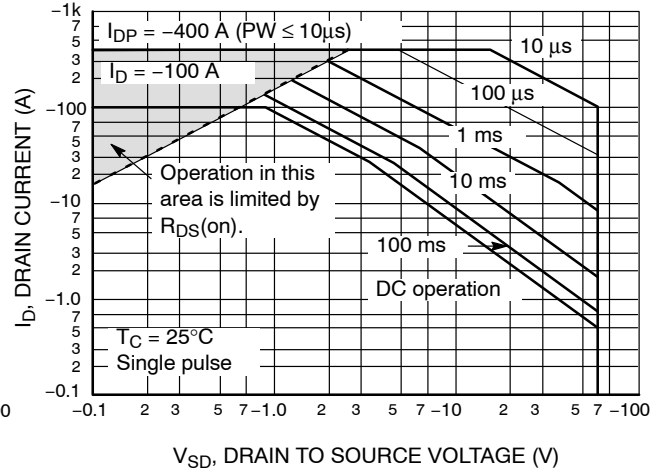


Figure 13. SOA

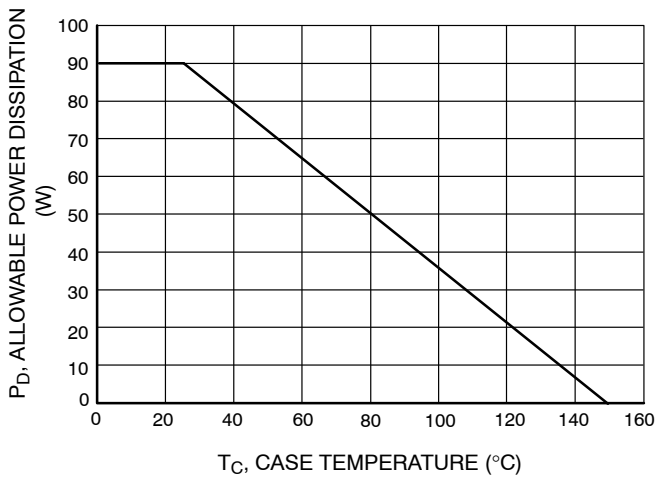


Figure 14. P_D - T_C

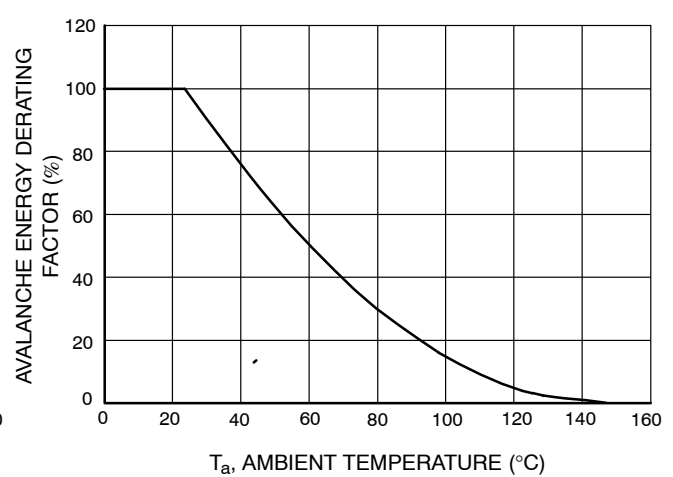


Figure 15. E_{AS} - T_a

ATP304

TYPICAL CHARACTERISTICS (CONTINUED)

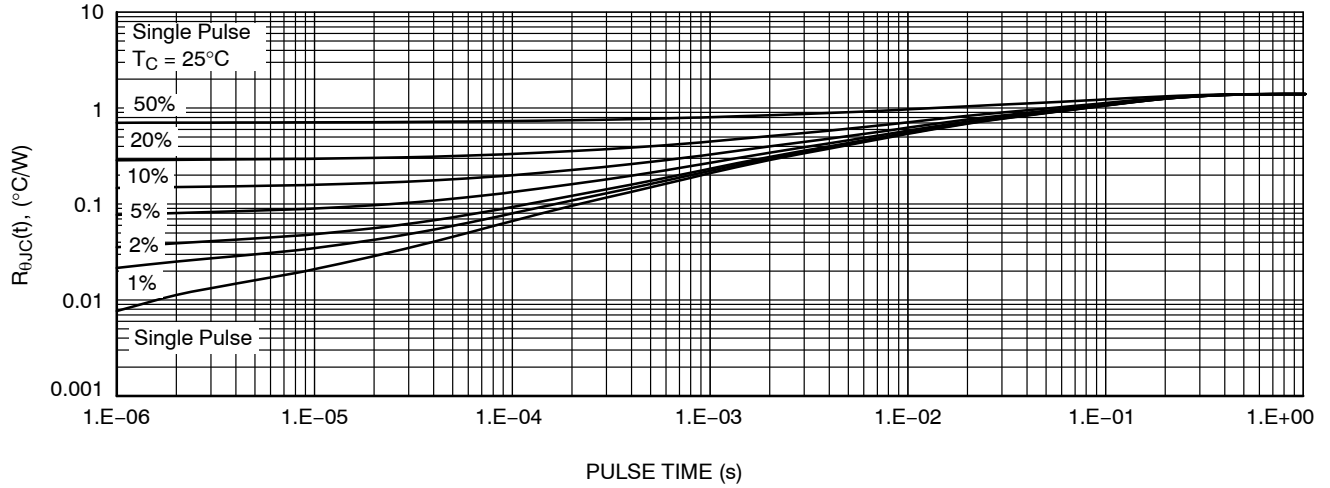
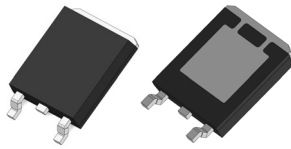


Figure 16. Thermal Response

DEVICE ORDERING INFORMATION

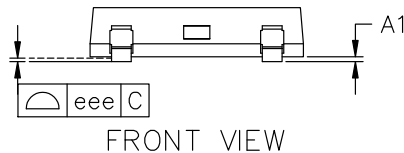
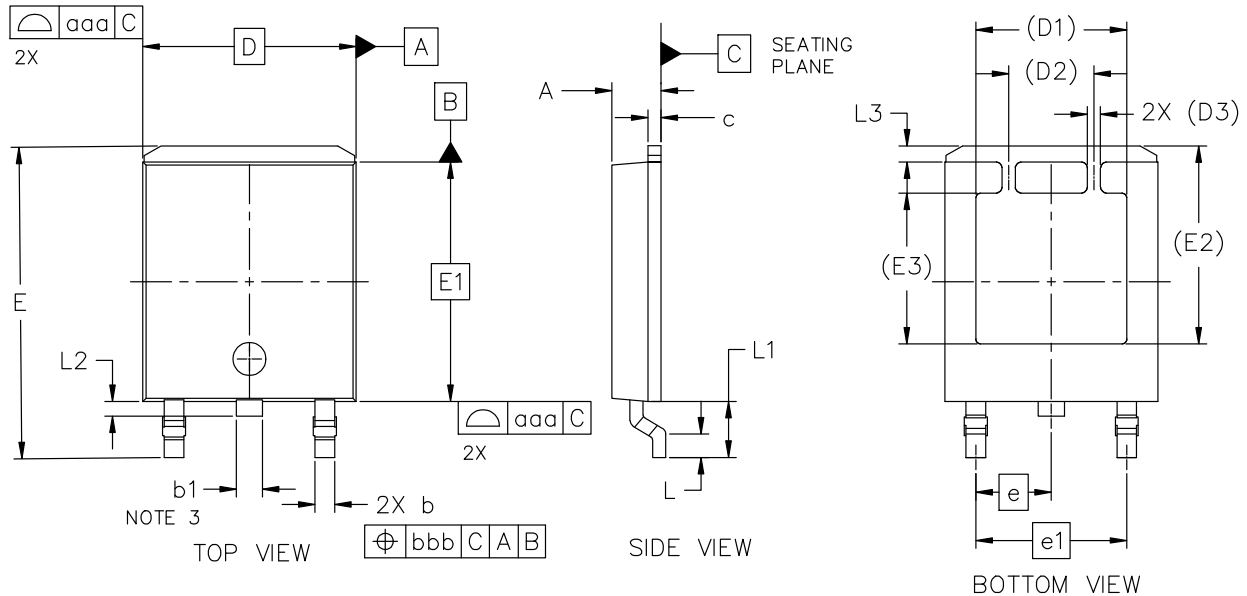
Device	Marking	Package	Shipping [†]
ATP304-TL-H	ATP304	DPAK (Single Gauge) / ATPAK (Pb-Free / Halogen Free)	3000/ Tape & Reel

[†]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](#).



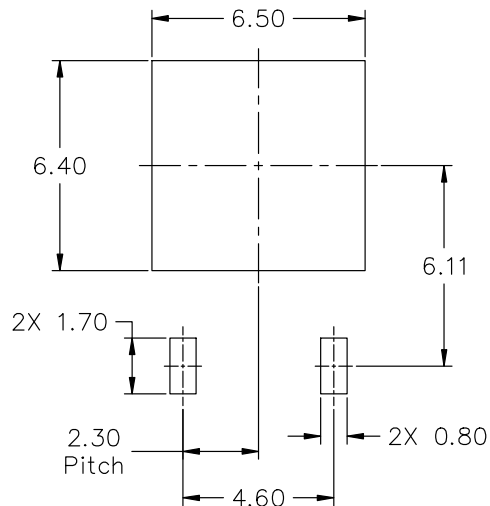
DPAK-4 6.50x7.30x1.50, 2.30P
CASE 369AM
ISSUE A

DATE 06 NOV 2025



NOTES:

1. DIMENSIONING AND TOLERANCING AS PER ASME-Y14.5M, 2018.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. PIN 2 IS IDLE PIN WITH ELECTRICAL DESIGNATION ONLY CARRIED.



RECOMMENDED MOUNTING FOOTPRINT

*For additional information on our Pb-free strategy and soldering details, please download the onsemi Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

MILLIMETERS			
DIM	MIN	NOM	MAX
A	1.35	1.50	1.65
A1	0.02	0.10	0.18
b	0.45	0.60	0.75
b1	0.65	0.80	0.95
c	0.30	0.40	0.50
D	6.50 BSC		
D1	4.60 REF		
D2	2.60 REF		
D3	0.40 REF		
E	9.30	9.50	9.70
E1	7.30 BSC		
E2	6.05 REF		
E3	4.60 REF		
e	2.30 BSC		
e1	4.60 BSC		
L	0.55	0.70	0.85
L1	1.55	1.70	1.85
L2	0.35	0.50	0.65
L3	0.35	0.50	0.65
TOLERANCE FORM & POSITION			
aaa	0.15		
bbb	0.20		
eee	0.10		

DOCUMENT NUMBER:	98AON67243E	Electronic versions are uncontrolled except when accessed directly from the Document Repository. Printed versions are uncontrolled except when stamped "CONTROLLED COPY" in red.
DESCRIPTION:	DPAK-4 6.50x7.30x1.50, 2.30P	PAGE 1 OF 1

onsemi and Onsemi are trademarks of Semiconductor Components Industries, LLC dba onsemi or its subsidiaries in the United States and/or other countries. onsemi reserves the right to make changes without further notice to any products herein. onsemi makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does onsemi assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. onsemi does not convey any license under its patent rights nor the rights of others.

onsemi, **Onsemi**, and other names, marks, and brands are registered and/or common law trademarks of Semiconductor Components Industries, LLC dba "**onsemi**" or its affiliates and/or subsidiaries in the United States and/or other countries. **onsemi** owns the rights to a number of patents, trademarks, copyrights, trade secrets, and other intellectual property. A listing of **onsemi**'s product/patent coverage may be accessed at www.onsemi.com/site/pdf/Patent-Marking.pdf. **onsemi** reserves the right to make changes at any time to any products or information herein, without notice. The information herein is provided "as-is" and **onsemi** makes no warranty, representation or guarantee regarding the accuracy of the information, product features, availability, functionality, or suitability of its products for any particular purpose, nor does **onsemi** assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. Buyer is responsible for its products and applications using **onsemi** products, including compliance with all laws, regulations and safety requirements or standards, regardless of any support or applications information provided by **onsemi**. "Typical" parameters which may be provided in **onsemi** data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. **onsemi** does not convey any license under any of its intellectual property rights nor the rights of others. **onsemi** products are not designed, intended, or authorized for use as a critical component in life support systems or any FDA Class 3 medical devices or medical devices with a same or similar classification in a foreign jurisdiction or any devices intended for implantation in the human body. Should Buyer purchase or use **onsemi** products for any such unintended or unauthorized application, Buyer shall indemnify and hold **onsemi** and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that **onsemi** was negligent regarding the design or manufacture of the part. **onsemi** is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner.

ADDITIONAL INFORMATION

TECHNICAL PUBLICATIONS:

Technical Library: www.onsemi.com/design/resources/technical-documentation
onsemi Website: www.onsemi.com

ONLINE SUPPORT: www.onsemi.com/support

For additional information, please contact your local Sales Representative at
www.onsemi.com/support/sales