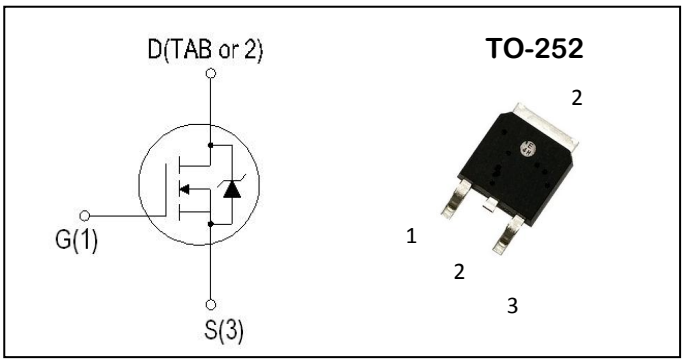
N-Channel Enhancement Mode Field Effect Transistor

PRODUCT SUMMARY

V_{DSS}	I_D	$R_{DS(ON)}$ (mΩ)
30V	70A	4.9mΩ@ V_{GS}= 10V



Features:

- Low Gate Charge for Fast Switching Application
- Low $R_{DS(ON)}$ to Minimize Conductive Loss
- 100% EAS Guaranteed
- Optimized $V_{(BR)DSS}$ Ruggedness
- Lead-Free,RoHS Compliant

Description:

The ADM3080E uses advanced trench technology and design to provide excellent $R_{DS(ON)}$ with low gate charge. It can be used in a wide variety of applications.

Absolute Maximum Ratings (T_A = 25°C unless otherwise specifed)

Symbol	Parameter		Ratings	Unit
Common Ratings				
V_{DSS}	Drain-Source Voltage		30	V
V_{GSS}	Gate-Source Voltage		±15V	
T_J	Maximum Junction Temperature		175	°C
T_{STG}	Storage Temperature Range		-55 to175	°C
I_S	Diode Continuous Forward Current	T_C =25°C	70	A
Mounted on Large Heat Sink				
I_{DM}	300μs Pulse Drain Current Tested (2)	T_C=25°C	300	A
I_D	Continuous Drain Current (1)	T_C=25°C	70	A
		T_C=100°C	50	A
P_D	Maximum Power Dissipation	T_C=25°C	70	W

Thermal Characteristics

Symbol	Parameter	Ratings	Unit
R_{thJC}	Thermal resistance junction-case max (1)	2.0	°C/W
R_{thJA}	Thermal resistance junction-ambient max (1)	65	°C/W

Electrical Characteristics (TA=25°C Unless Otherwise Noted)

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
On/off Characteristics						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	V_{GS}=0V, I_{DS}=250uA	30	--	--	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=30V,V_{GS}=0V , T_J=25°C	--	--	1.0	uA
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_{DS}=250uA	1.0	1.6	2.5	V
I_{GSS}	Gate Leakage Current	V_{GS}=±15V, V_{DS}=0V	--	--	±100	nA
$R_{DS(ON)}$	Drain-SourceOn-stateResistance (2)	V_{GS}= 10V, I_{DS}=25A	--	4	4.9	mΩ
		V_{GS}= 4.5V, I_{DS}=20A	--	5.1	6.6	
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{GS}=0V, V_{DS}=15V, Frequency=1MHz	--	2200	--	pF
C_{oss}	Output Capacitance		--	370	--	
C_{rss}	Reverse Transfer Capacitance		--	250	--	
Switching Characteristics						
$t_{d(ON)}$	Turn-on Delay Time	V_{DS}=15V, I_D= 70A, V_{GS}= 10V, R_{GEN}=2.7Ω	--	7	--	nS
t_r	Turn-on Rise Time		--	12	--	
$t_{d(OFF)}$	Turn-off Delay Time		--	26	--	
t_f	Turn-off Fall Time		--	10	--	
Q_g	Total Gate Charge	V_{DS}=15V, V_{GS}= 10V, I_{DS}=70A	--	32	--	nC
Q_{gs}	Gate-Source Charge		--	5	--	
Q_{gd}	Gate-Drain Charge		--	10	--	
Avalanche Characteristics						
EAS	Single Pulse Avalanche Energy (3)	L=0.5mH I_{AS} =28A, Vgs = 10V, R_G =50Ω , Starting T_J = 25°C	--	--	290	mJ
Diode Characteristics						
V_{SD}	Diode Forward Voltage (2)	I_{SD} = 70A, V_{GS} = 0	--	--	1.4	V
t_{rr}	Reverse Recovery Time	I_{SD}=70A, dI_{SD}/dt=100A/μs	--	35	--	ns
q_{rr}	Reverse Recovery Charge		--	25	--	nC

NOTES:

1. Surface Mounted on FR4 Board, t ≤ 10 sec.

2.The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 0.5%

3.The Min. value is 100% EAS tested guarantee.

Typical Performance Characteristics

Figure 1: On-Region Characteristics

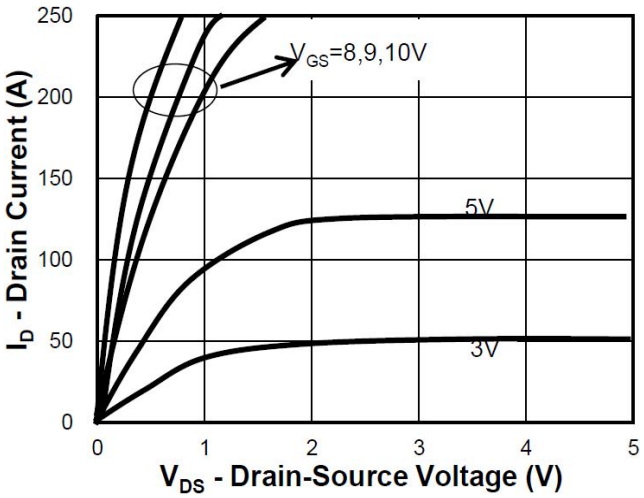


Figure 2: Power Dissipation

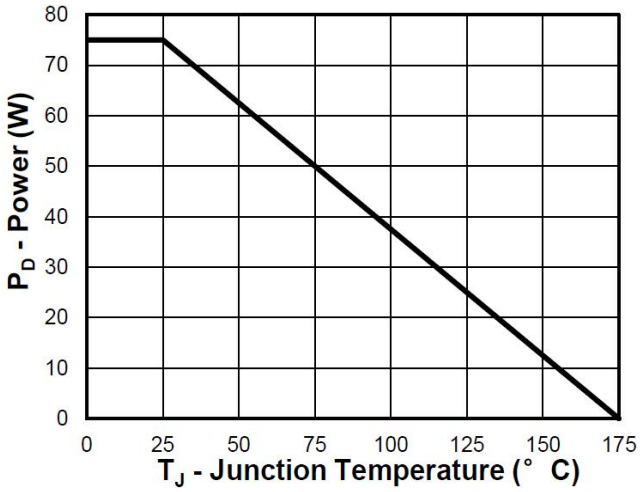


Figure 3: Maximun Drain Current vs. Case Temperaturet

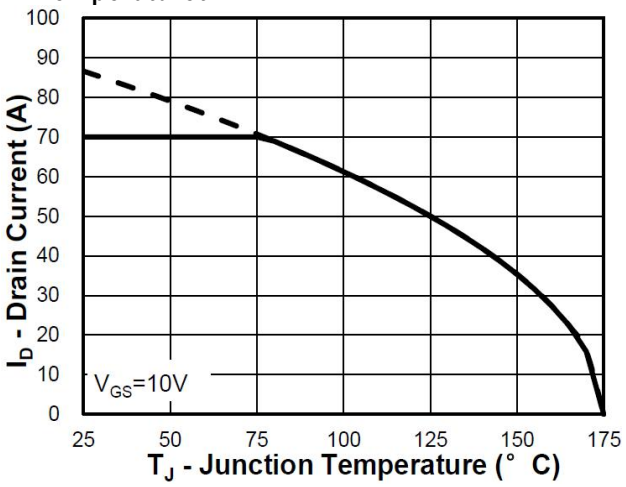


Figure 4: Drain-Source on Resistance

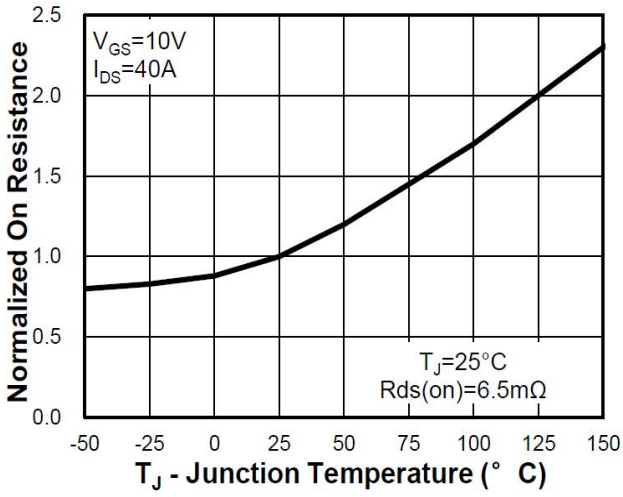


Figure 5: Source- Drain Diode Forward

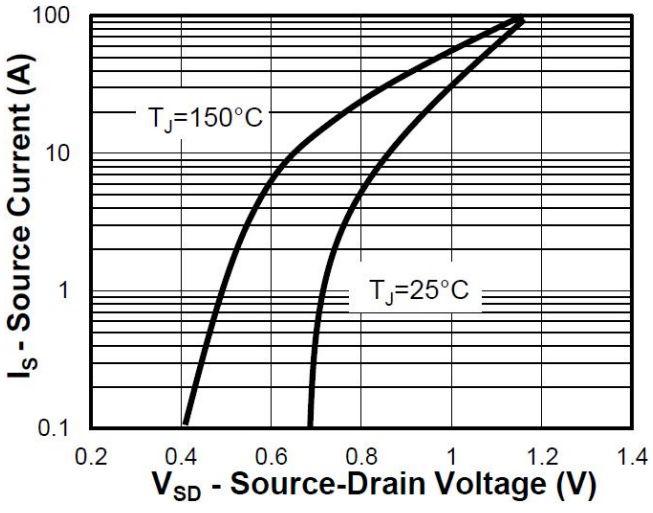


Figure 6: Gate Charge Characteristics

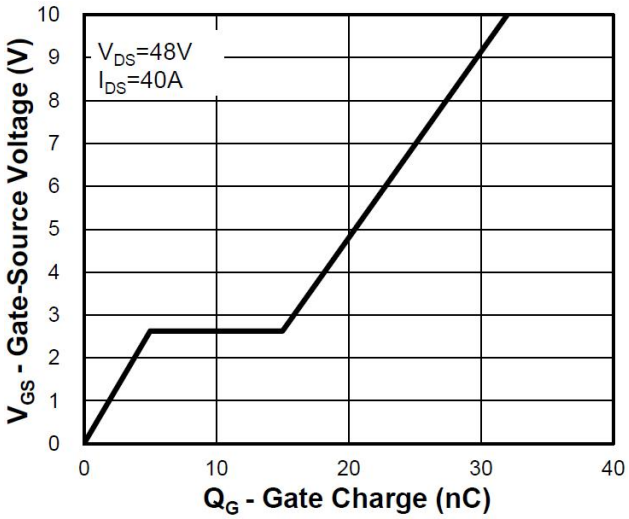


Figure 7: Capacitance vs Vds

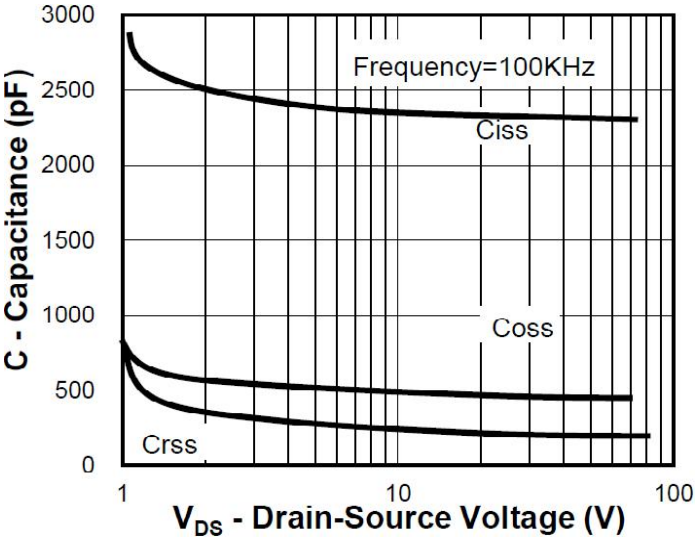


Figure 8: Safe Operation Area

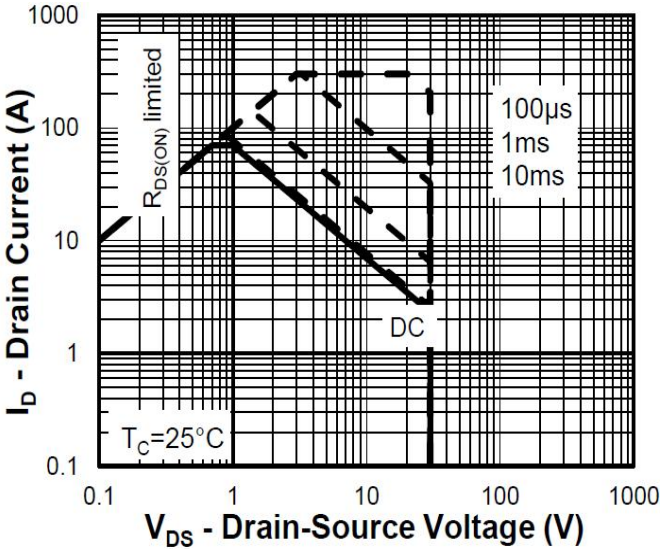
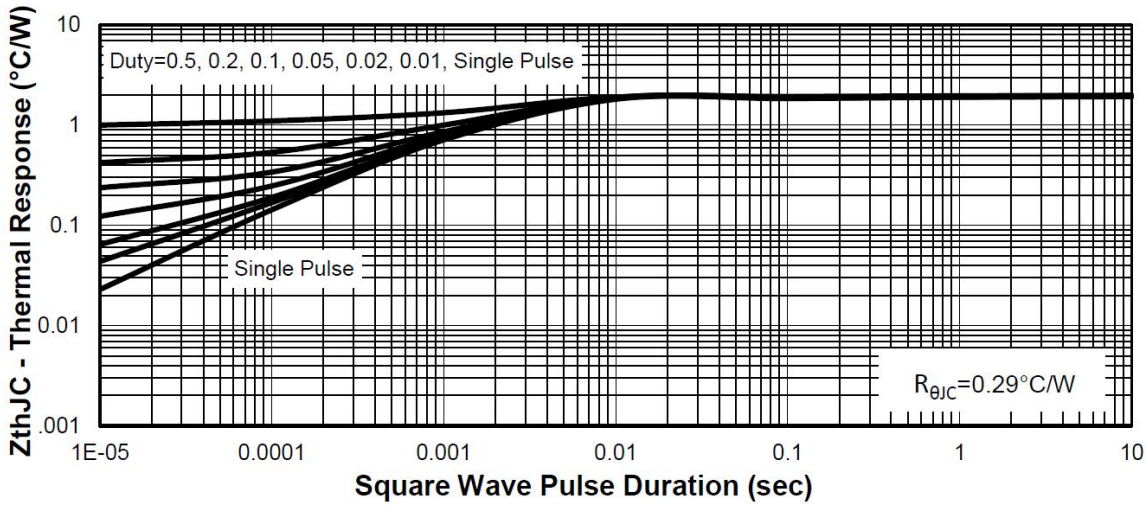
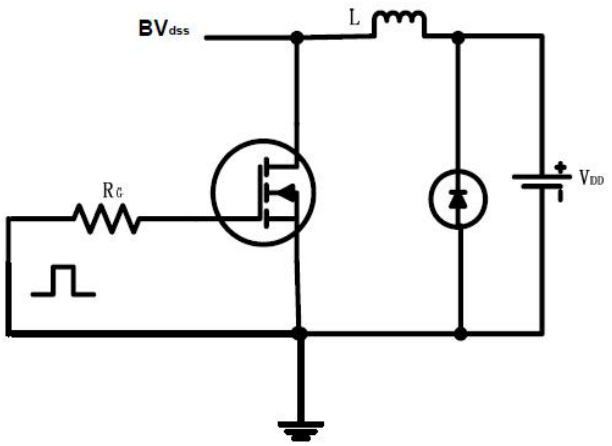


Figure 9: Transient Thermal Impedance

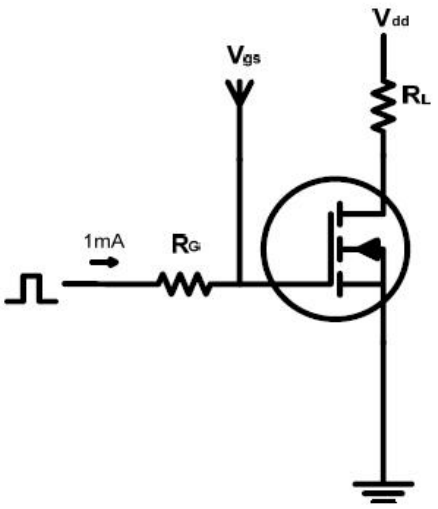


Test circuits and Waveforms

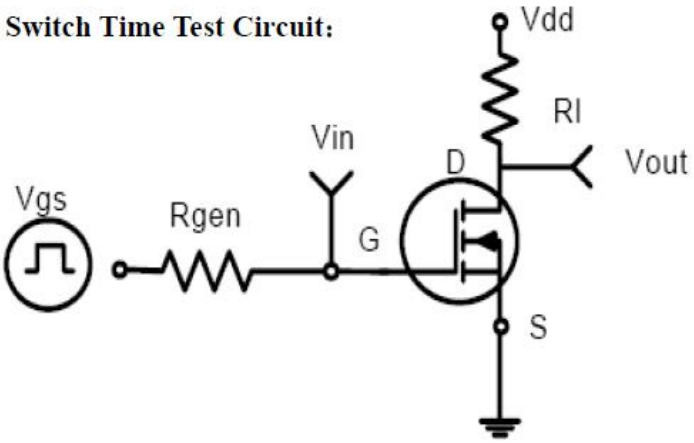
EAS test circuits:



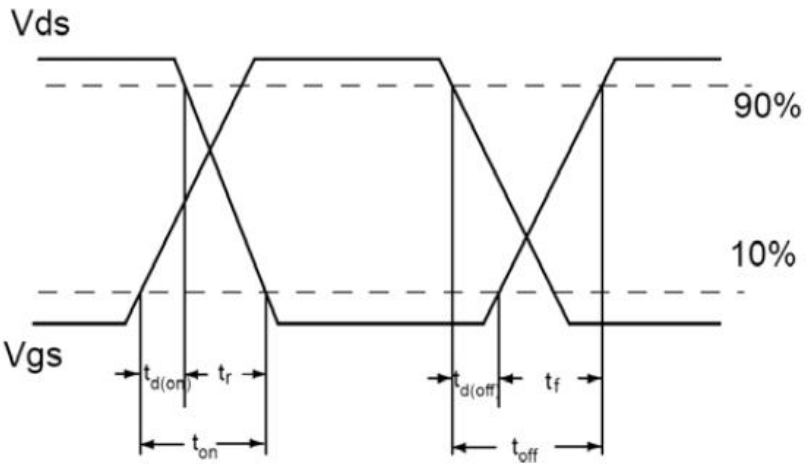
Gate charge test circuit:



Switch Time Test Circuit:

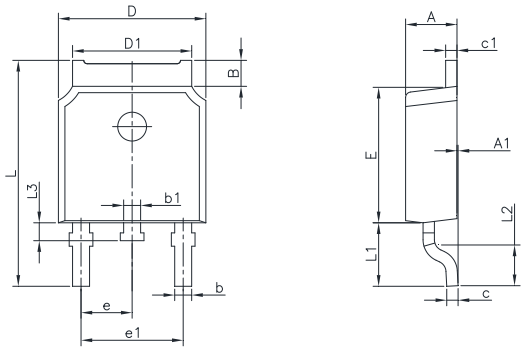


Switch Waveforms:



PACKAGE MECHANICAL DATA

TO-252-2 Package Dimension



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	1.070	1.220	0.042	0.048
b	0.720	0.850	0.028	0.033
b1	0.720	0.850	0.028	0.033
c	0.450	0.620	0.017	0.024
c1	0.450	0.620	0.017	0.024
D	6.350	6.800	0.250	0.280
D1	5.200	5.500	0.205	0.220
E	5.900	6.200	0.232	0.244
e	2.300 TYP.		0.091 TYP.	
e1	4.500	4.700	0.177	0.185
L	9.500	10.60	0.374	0.396
L1	2.550	2.900	0.100	0.114
L2	1.400	1.780	0.055	0.070
L3	0.600	0.900	0.024	0.035

Ordering information

Part number	Package	Marking	Packing	Quantity
ADM3080E	TO-252-2	ADM3080E	Tube	80pcs
			Embossed tape	2500pcs

Notice

1. All information included in this document such as product data, diagrams, charts, programs, algorithms, and application circuit examples, is current as of the date this document is issued. Such information, however, is subject to change without any prior notice. Before purchasing or using any ADV products listed in this document, please confirm the latest product information with a ADV sales office. Also, please pay regular and careful attention to additional and different information to be disclosed by ADV such as that disclosed through our website. (http://www.advsemi.com)
2. ADV has used reasonable care in compiling the information included in this document, but ADV assumes no liability whatsoever for any damages incurred as a result of errors or omissions in the information included in this document.
3. You should use the products described herein within the range specified by ADV, especially with respectvto the maximum rating, operating supply voltage range, movement power voltage range, heat radiation characteristics, installation and other product characteristics. ADV shall have no liability for malfunctions or damages arising out of the use of ADV products beyond such specified ranges.
4. When using or otherwise relying on the information in this document, you should evaluate the information in light of the total system before deciding about the applicability of such information to the intended application.ADV makes no representations, warranties or guaranties regarding the suitability of its products for any particular application and specifically disclaims any liability arising out of the application and use of the information in this document or ADV products.
5. Although ADV endeavors to improve the quality and reliability of its products, IC products have specific characteristics such as the occurrence of failure at a certain rate and malfunctions under certain use conditions. Please be sure to implement safety measures to guard against the possibility of physical injury, and injury or damage caused by fire in the event of the failure of a ADV product, such as safety design for hardware and software including but not limited to redundancy, fire control and malfunction prevention, appropriate treatment for aging degradation or any other applicable measures. Among others, since the evaluation of microcomputer software alone is very difficult, please evaluate the safety of the final products or system manufactured by you.
6. This document is provided for reference purposes only so that ADV customers may select the appropriate ADV products for their use. ADV neither makes warranties or representations with respect to the accuracy or completeness of the information contained in this document nor grants any license to any intellectual property rights or any other rights of ADV or any third party with respect to the information in this document.
7. ADV shall have no liability for damages or infringement of any intellectual property or other rights arising out of the use of any information in this document, including, but not limited to, product data, diagrams, charts,programs, algorithms, and application circuit examples.
8. This document may not be reproduced or duplicated, in any form, in whole or in part, without prior written approval from ADV.