

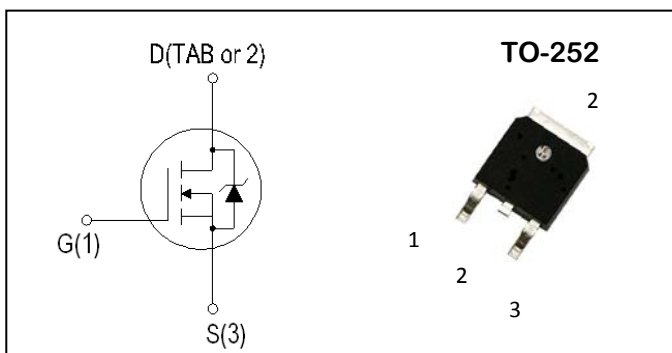
## N-Channel Enhancement Mode Field Effect Transistor

### PRODUCT SUMMARY

$V_{DSS}$	$I_D$	$R_{DS(ON)}$ (m $\Omega$ )
30V	150A	3m $\Omega$

### 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 ADM150N03E 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 ( $T_A = 25^\circ\text{C}$ unless otherwise specified )

Symbol	Parameter		Ratings	Unit
Common Ratings				
V <sub>DSS</sub>	Drain-Source Voltage		30	V
V <sub>GSS</sub>	Gate-Source Voltage		± 20V	
T <sub>J</sub>	Maximum Junction Temperature		150	°C
T <sub>STG</sub>	Storage Temperature Range		-55 to 175	°C
I <sub>S</sub>	Diode Continuous Forward Current	T <sub>C</sub> =25°C	150	A
Mounted on Large Heat Sink				
I <sub>DM</sub>	300μs Pulse Drain Current Tested <sup>(2)</sup>	T <sub>C</sub> =25°C	600	A
I <sub>D</sub>	Continuous Drain Current <sup>(1)</sup>	T <sub>C</sub> =25°C	150	A
		T <sub>C</sub> =100°C	98	A
P <sub>D</sub>	Maximum Power Dissipation	T <sub>C</sub> =25°C	108	W

### Thermal Characteristics

Symbol	Parameter	Ratings	Unit
$R_{thJC}$	Thermal resistance junction-case max <sup>(1)</sup>	1.4	$^\circ\text{C/W}$
$R_{thJA}$	Thermal resistance junction-ambient max <sup>(1)</sup>	68	$^\circ\text{C/W}$

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

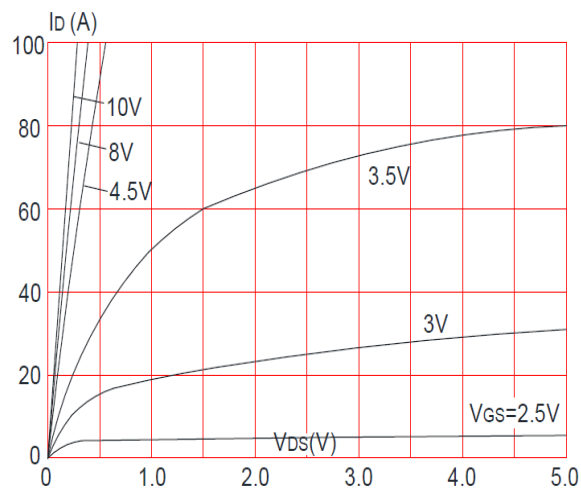
Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
On/off Characteristics						
V(BR)DSS	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>DS</sub> =250uA	30	--	--	V
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> =30V, V <sub>GS</sub> =0V , T <sub>J</sub> =25°C	--	--	1	uA
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>DS</sub> =250uA	1	1.6	2.5	V
I <sub>GSS</sub>	Gate Leakage Current	V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V	--	--	±100	nA
R <sub>DS(ON)</sub>	Drain-SourceOn-stateResistance <sup>(2)</sup>	V <sub>GS</sub> = 10V, I <sub>DS</sub> =30A	--	2.5	3	mΩ
Dynamic Characteristics						
C <sub>iss</sub>	Input Capacitance	V <sub>GS</sub> =0V,	--	3500	--	pF
C <sub>oss</sub>	Output Capacitance	V <sub>DS</sub> =15V,	--	500	--	
C <sub>rss</sub>	Reverse Transfer Capacitance	Frequency=1MHz	--	431	--	
Switching Characteristics						
t <sub>d(ON)</sub>	Turn-on Delay Time	V <sub>DS</sub> =15V,	--	26	--	nS
t <sub>r</sub>	Turn-on Rise Time	I <sub>D</sub> = 30A, V <sub>GS</sub> = 10V,	--	24	--	
t <sub>d(OFF)</sub>	Turn-off Delay Time	R <sub>GEN</sub> =3 Ω	--	91	--	
t <sub>f</sub>	Turn-off Fall Time		--	39	--	
Q <sub>g</sub>	Total Gate Charge	V <sub>DS</sub> =15V, V <sub>GS</sub> = 10V,	--	38	--	nC
Q <sub>gs</sub>	Gate-Source Charge	I <sub>DS</sub> =30A	--	9	--	
Q <sub>gd</sub>	Gate-Drain Charge		--	13	--	
Avalanche Characteristics						
EAS	Single Pulse Avalanche Energy <sup>(3)</sup>	L=0.5mH , T <sub>C</sub> =25°C	--	--	225	mJ
Diode Characteristics						
V <sub>SD</sub>	Diode Forward Voltage <sup>(2)</sup>	I <sub>SD</sub> = 30A, V <sub>GS</sub> = 0	--	--	1.2	V
t <sub>rr</sub>	Reverse Recovery Time	I <sub>SD</sub> =20A, dI <sub>SD</sub> /dt=100A/μs	--	42	--	ns
q <sub>rr</sub>	Reverse Recovery Charge		--	39	--	nC

## NOTES:

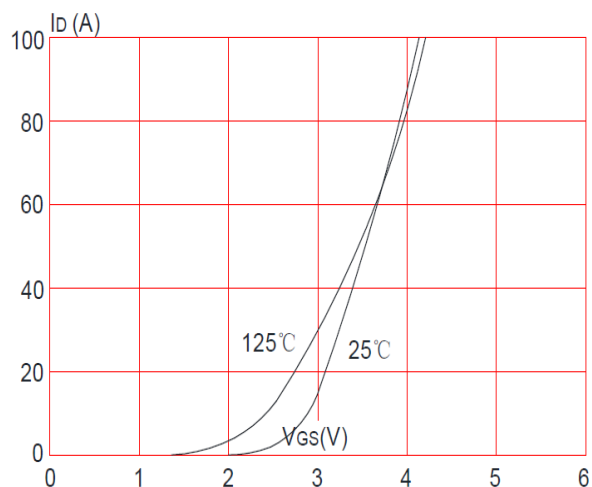
1. Surface Mounted on FR4 Board, t ≤ 10 sec.
2. The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 0.5%
3. The Min. value is 100% EAS tested guarantee.

## Typical Performance Characteristics

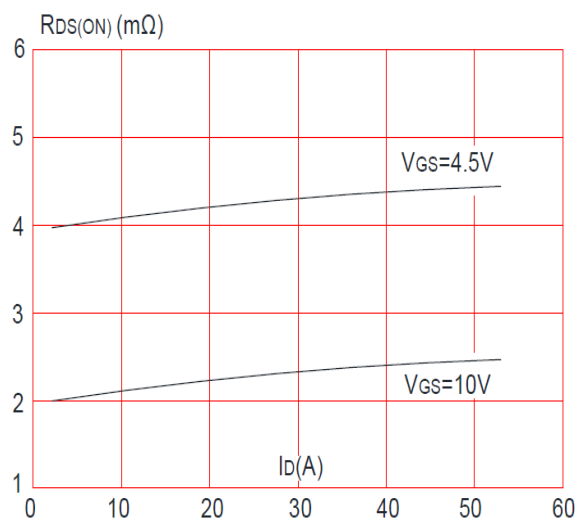
**Figure 1: On-Region Characteristics**



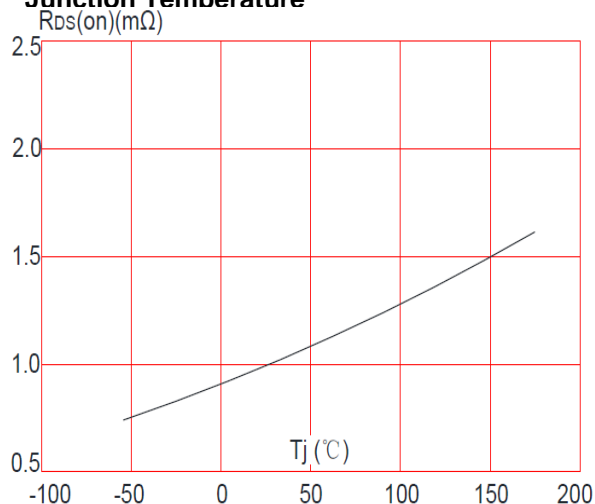
**Figure 2: Transfer Characteristics**



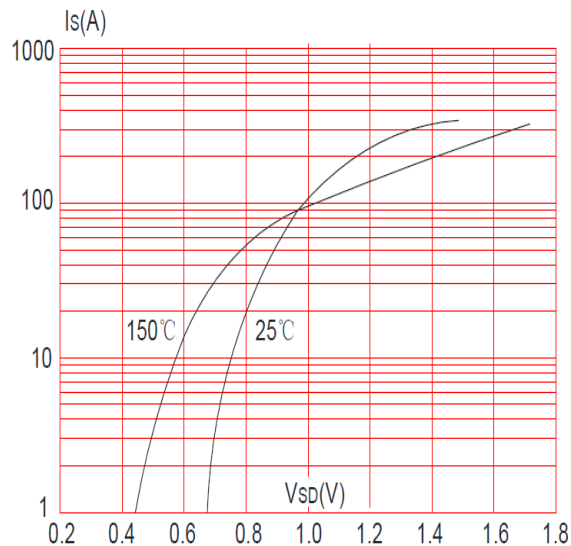
**Figure 3: Rdson- Drain Current**



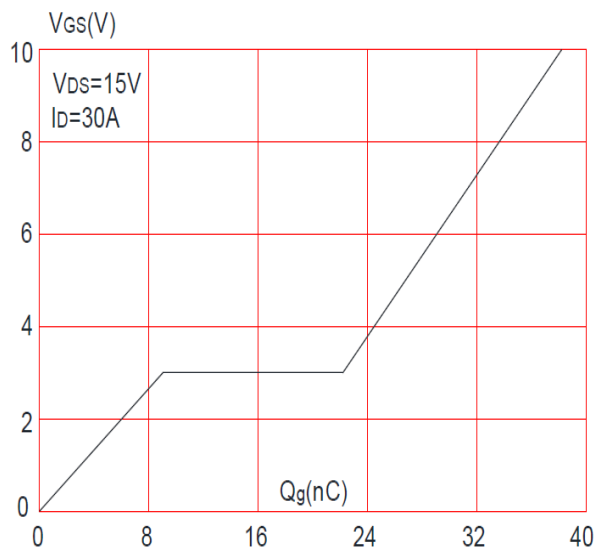
**Figure 4: Normalized on Resistance vs. Junction Temperature**



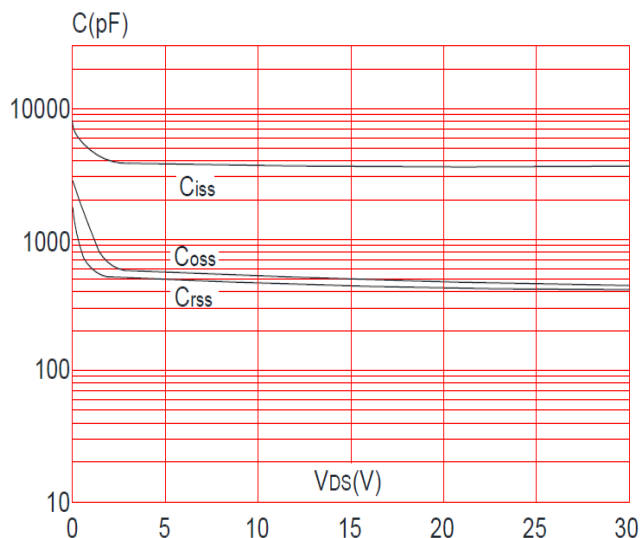
**Figure 5: Source- Drain Diode Forward**



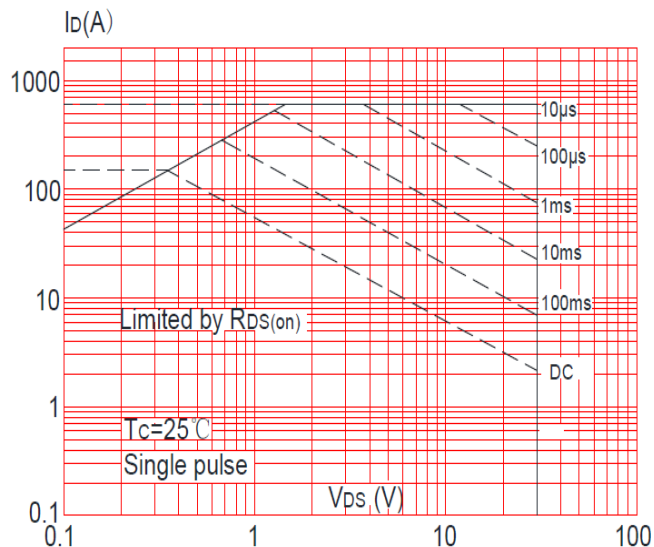
**Figure 6: Gate Charge Characteristics**



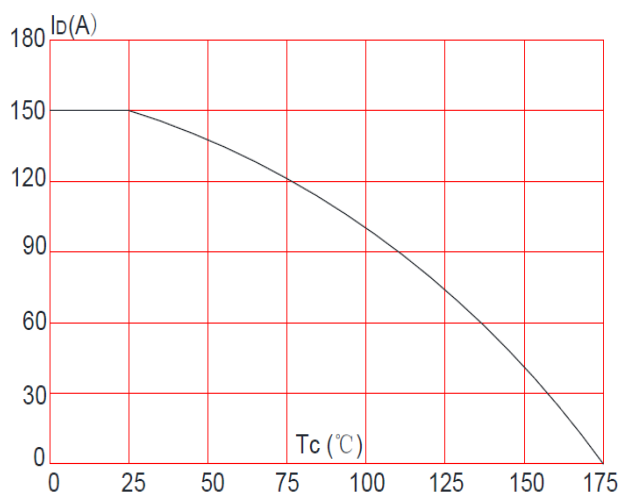
**Figure 7: Capacitance vs Vds**



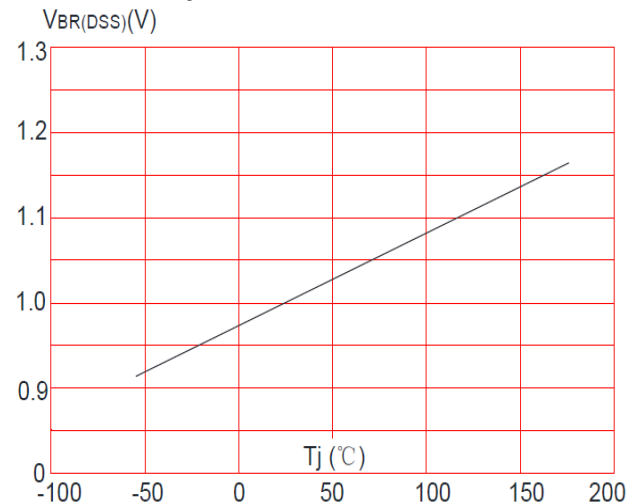
**Figure 8: Safe Operation Area**



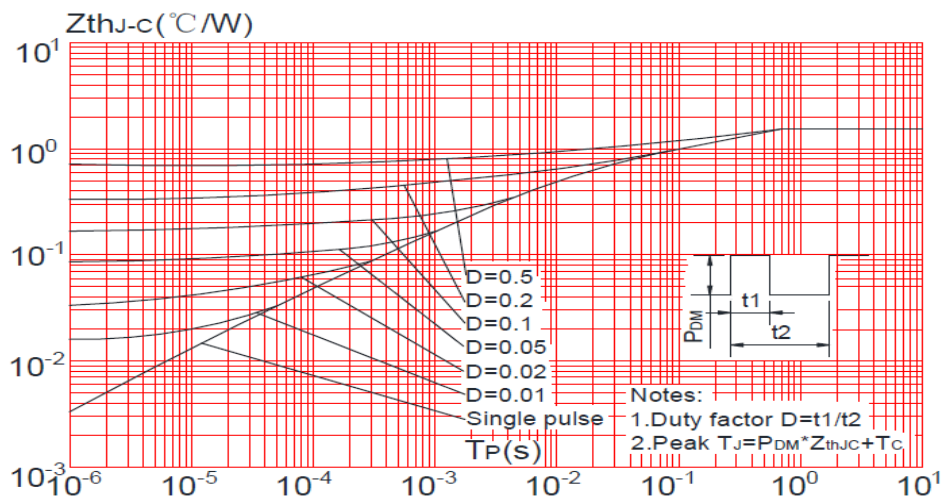
**Figure 9: Maximum Drain Current vs. Case Temperature**



**Figure 10: Normalized Breakdown Voltage vs. Junction Temperature**

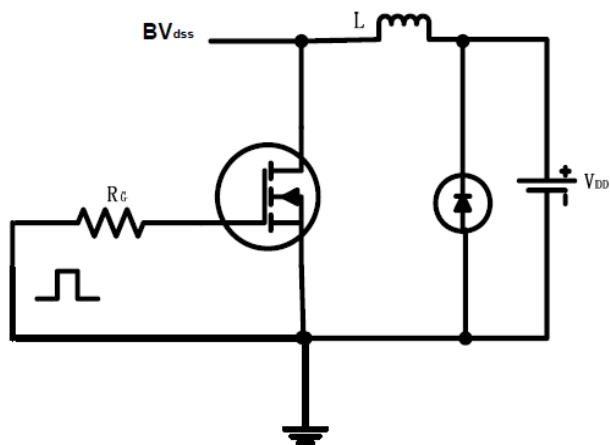


**Figure 11: Maximum Effective Transient Thermal Impedance, Junction-to-Case**

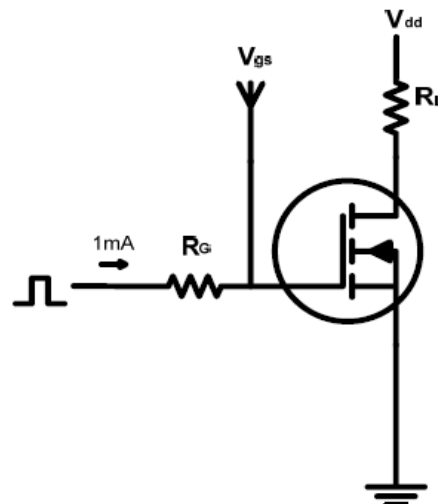


## Test circuits and Waveforms

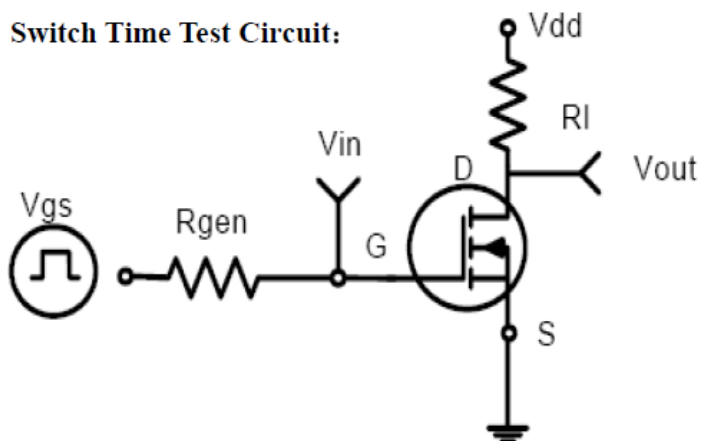
EAS test circuits:



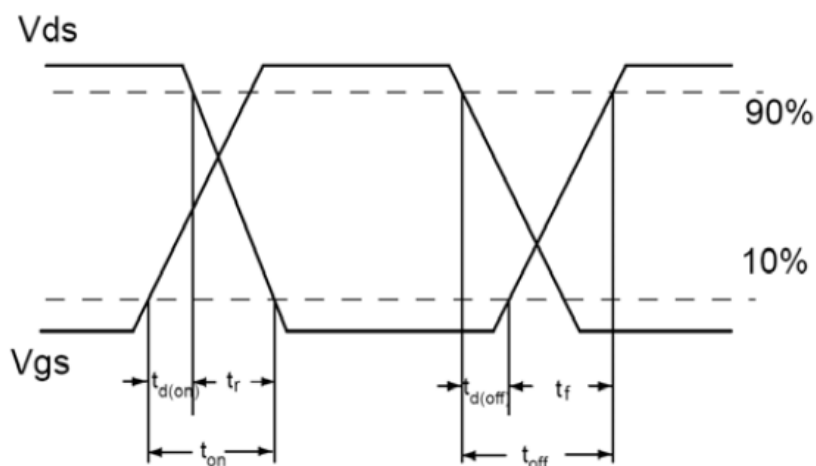
Gate charge test circuit:



Switch Time Test Circuit:

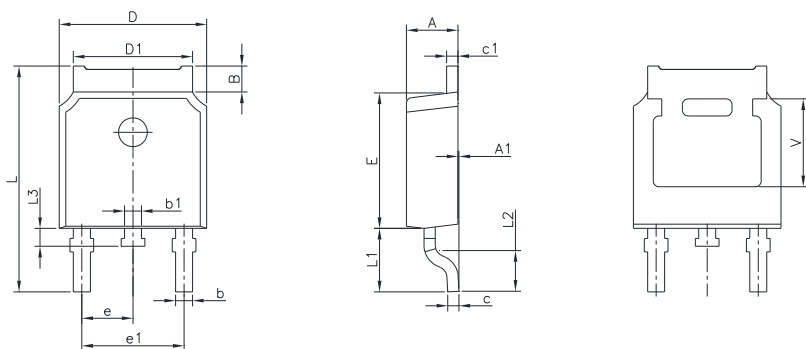


Switch Waveforms:



### 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	6.650	0.250	0.262
D1	5.200	5.400	0.205	0.213
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
V	3.950 REF.		0.155 REF.	

#### Ordering information

Part number	Package	Marking	Packing	Quantity
ADM150N03E	TO-252-2	ADM150N06E	Tube	80pcs
			Embossed tape	2500pcs

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