



### DESCRIPTION

The AM04N80 is available in TO-251, TO-252 Package

### FEATURE

- Proprietary New Planar Technology
- $R_{DS(ON),typ.}=3.7\ \Omega@V_{GS}=10V$
- Low Gate Charge Minimize Switching Loss
- Fast Recovery Body Diode

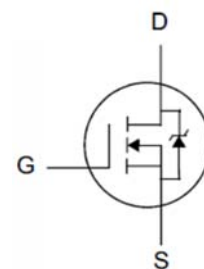
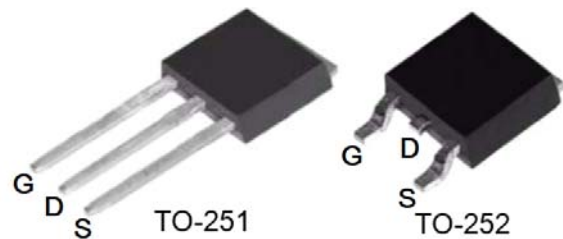
### APPLICATION

- CRT
- TV/Monitor

### ORDERING INFORMATION

Package Type	Part Number	
TO-251 SPQ: 75pcs /Tube	TS3	AM04N80TS3U
		AM04N80TS3VU
TO-252 SPQ: 2,500pcs/Reel	D	AM04N80DR
		AM04N80DVR
Note	V: Halogen free Package R: Tape & Reel U: Tube	
AiT provides all RoHS products		

### PIN DESCRIPTION



Pin#	Symbol	Function
1	G	Gate
2	D	Drain
3	S	Source

**ABSOLUTE MAXIMUM RATINGS**T<sub>A</sub> = 25°C, unless otherwise specified.

Parameter	Symbol	Value	Unit
Drain-to-Source Voltage <sup>(1)</sup>	V <sub>DSS</sub>	800	V
Gate-to-Source Voltage	V <sub>GSS</sub>	±30	
Continuous Drain Current	I <sub>D</sub>	4	A
Continuous Drain Current @ T <sub>c</sub> =100°C	I <sub>D @ T<sub>c</sub>=100°C</sub>	Fig 3.	
Pulsed Drain Current at V <sub>GS</sub> =10V <sup>(2)</sup>	I <sub>DM</sub>	Fig 6.	
Single Pulse Avalanche Energy	E <sub>AS</sub>	650	mJ
Peak Diode Recovery dv/dt <sup>(3)</sup>	dv/dt	5.0	V/ns
Power Dissipation	P <sub>D</sub>	85	W
Derating Factor above 25°C		0.68	W/°C
Maximum Temperature for Soldering Leads at 0.063in (1.6mm) from Case for 10 seconds, Package Body for 10 seconds	T <sub>L</sub> T <sub>PAK</sub>	300 260	°C
Operating and Storage Temperature Range	T <sub>J</sub> & T <sub>STG</sub>	-55 to 150	
<b>THERMAL RESISTANCE</b>			
Thermal Resistance, Junction-to-Case	R <sub>θJC</sub>	1.47	°C/W
Thermal Resistance, Junction-to-Ambient	R <sub>θJA</sub>	75	

<sup>(1)</sup> T<sub>A</sub>=+25°C to +150°C<sup>(2)</sup> Repetitive rating; pulse width limited by maximum junction temperature.

Stresses above may cause permanent damage to the device. These are stress ratings only and functional operation of the device at these or any other conditions beyond those indicated in the Electrical Characteristics are not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.



## ELECTRICAL CHARACTERISTICS

T<sub>A</sub> = 25°C, unless otherwise specified.

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
<b>OFF CHARACTERISTICS</b>						
Drain-to-Source Breakdown Voltage	BV <sub>DSS</sub>	V <sub>GS</sub> =0V, I <sub>D</sub> =250uA	800			V
Drain-to-Source Leakage Current	I <sub>DSS</sub>	V <sub>DS</sub> =800V, V <sub>GS</sub> =0V			1	uA
		V <sub>DS</sub> =640V, V <sub>GS</sub> =0V, T <sub>A</sub> =125°C			100	
Gate-to-Source Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> =+30V, V <sub>DS</sub> =0V			+100	nA
		V <sub>GS</sub> =-30V, V <sub>DS</sub> =0V			-100	
<b>ON CHARACTERISTICS</b>						
Static Drain-to-Source On-Resistance <sup>(4)</sup>	R <sub>DS(ON)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =2.0A		3.7	4.8	Ω
Gate Threshold Voltage	V <sub>GS(TH)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250uA	2.0		4.0	V
Forward Transconductance <sup>(4)</sup>	g <sub>fs</sub>	V <sub>DS</sub> =15V, I <sub>D</sub> =4.0A		5.5		S
<b>Dynamic CHARACTERISTICS</b>						
Input Capacitance	C <sub>iss</sub>	V <sub>GS</sub> =0V, V <sub>DS</sub> =25V, f=1.0MHz		490		pF
Reverse Transfer Capacitance	C <sub>rss</sub>			25		
Output Capacitance	C <sub>oss</sub>			50		
Total Gate Charge	Q <sub>g</sub>	V <sub>DD</sub> =400V, I <sub>D</sub> =4A, V <sub>GS</sub> =0 to 10V		16		nC
Gate-to-Source Charge	Q <sub>gs</sub>			3.0		
Gate-to-Drain (Miller) Charge	Q <sub>gd</sub>			6.0		
<b>Resistive Switching CHARACTERISTICS</b>						
Turn-on Delay Time	t <sub>d(ON)</sub>	V <sub>DD</sub> =400V, I <sub>D</sub> =4A, V <sub>GS</sub> =10V R <sub>G</sub> =12Ω		10		nS
Rise Time	t <sub>rise</sub>			10		
Turn-Off Delay Time	t <sub>d(OFF)</sub>			30		
Fall Time	t <sub>fall</sub>			15		
<b>Source-Drain Diode CHARACTERISTICS</b>						
Continuous Source Current <sup>(4)</sup>	I <sub>SD</sub>	Integral PN-diode in MOSFET			4.0	A
Pulsed Source Current <sup>(4)</sup>	I <sub>SM</sub>				16	
Diode Forward Voltage	V <sub>SD</sub>	I <sub>S</sub> =4.0A, V <sub>GS</sub> =0V			1.5	V
Reverse Recovery Time	t <sub>rr</sub>	V <sub>GS</sub> =0V, I <sub>F</sub> =4.0A,		235		ns
Reverse Recovery Charge	Q <sub>rr</sub>	dI <sub>F</sub> /dI=100A/μs		446		nC

<sup>(3)</sup> I<sub>SD</sub>= 4A di/dt < 100 A/μs, V<sub>DD</sub> < BV<sub>DSS</sub>, T<sub>J</sub>=+150°C.

<sup>(4)</sup> Pulse width≤380μs; duty cycles≤2%.



## TYPICAL PERFORMANCE CHARACTERISTICS

Fig 1. Maximum Effective Thermal Impedance, Junction-to-Case

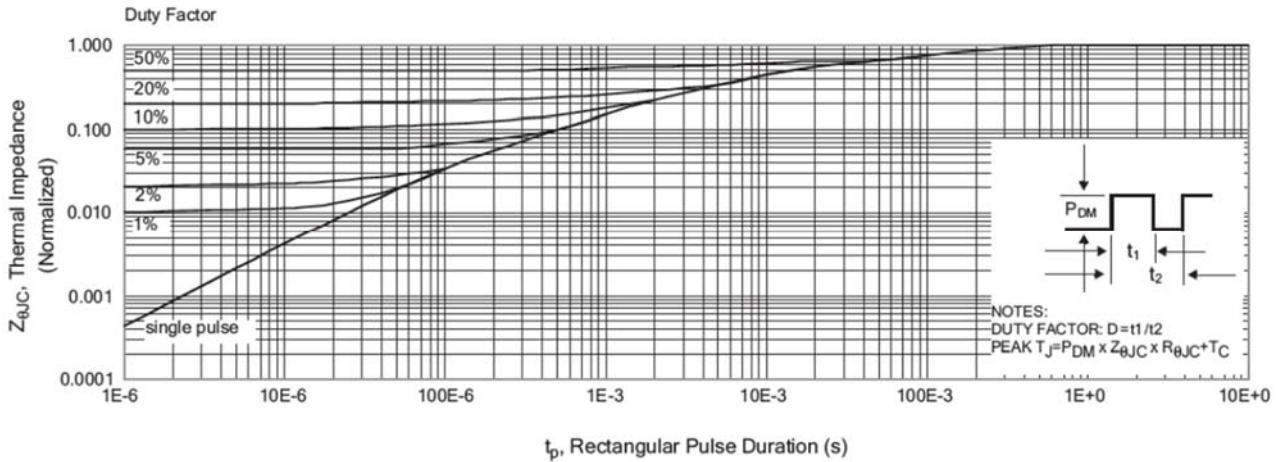


Fig 2. Maximum Power Dissipation vs Case Temperature

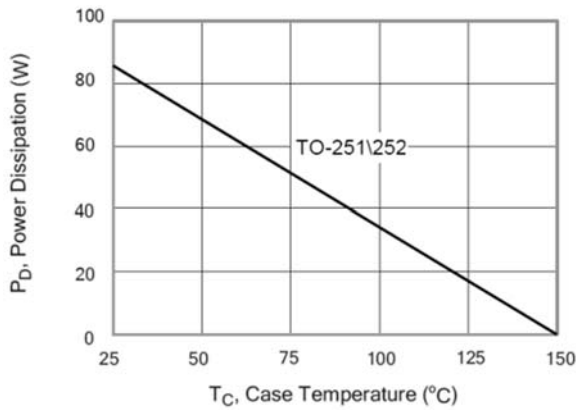


Fig 3. Maximum Continuous Drain Current vs Case Temperature

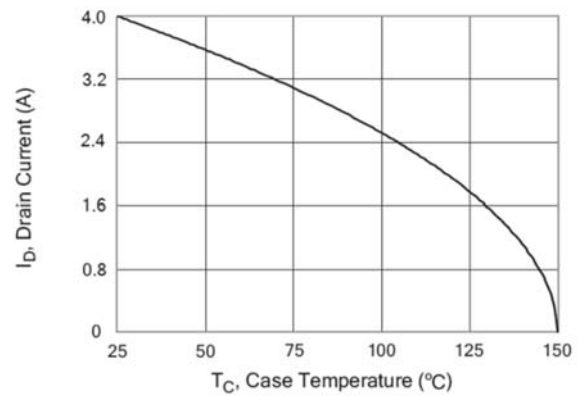


Fig 4. Typical Output Characteristics

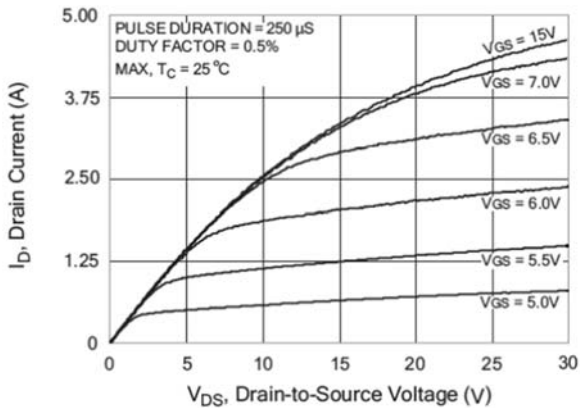


Fig 5. Typical Drain-to-Source ON Resistance Vs Gate Voltage and Drain Current

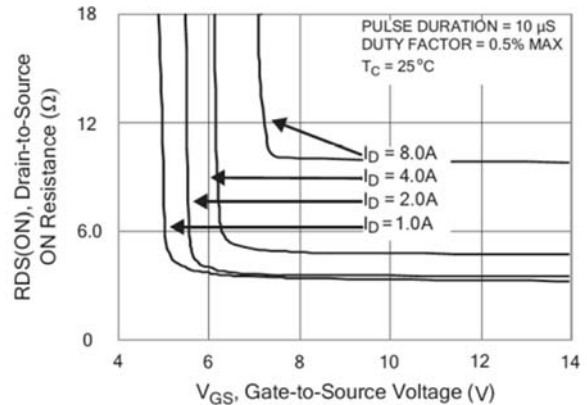




Fig 6. Maximum Peak Current Capability

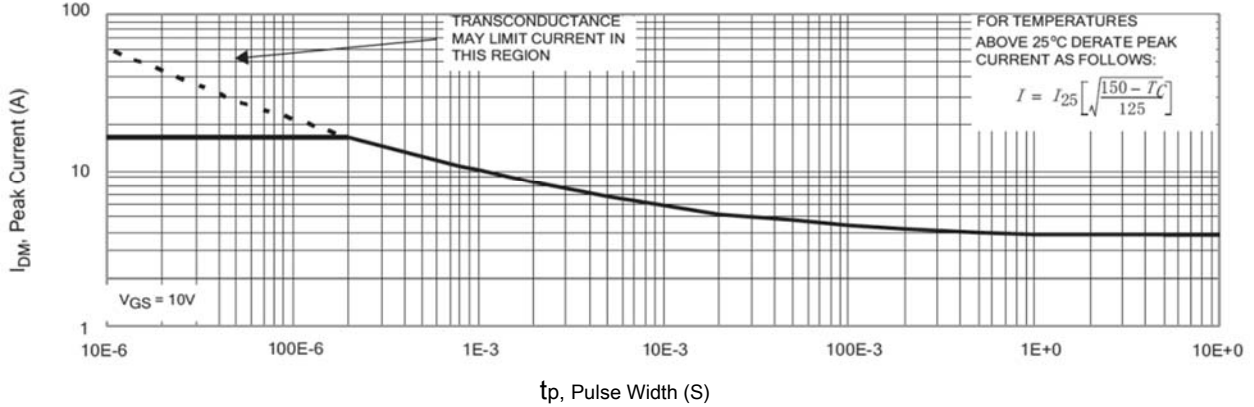


Fig 7. Typical Transfer Characteristics

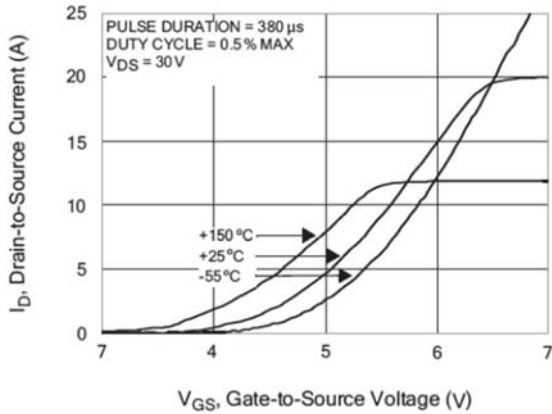


Fig 8. Unclamped Inductive Switching Capability

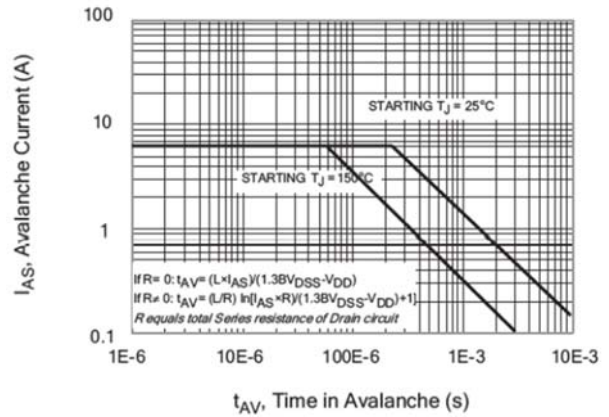


Fig 9. Typical Drain-to-Source ON Resistance vs Drain Current

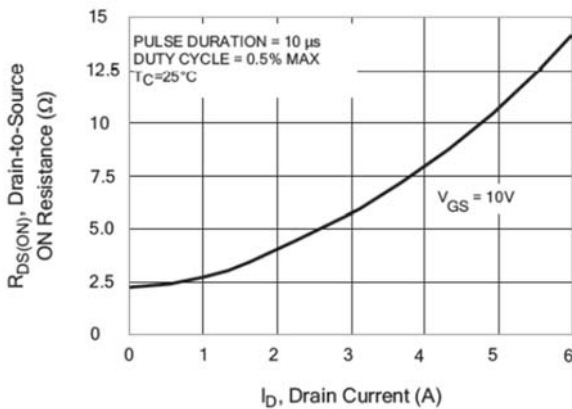


Fig 10. Typical Drain-to-Source ON Resistance vs Junction Temperature

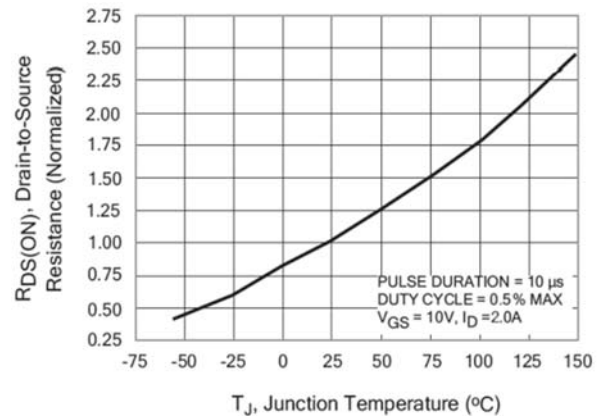




Fig11. Typical Breakdown Voltage vs Junction Temperature

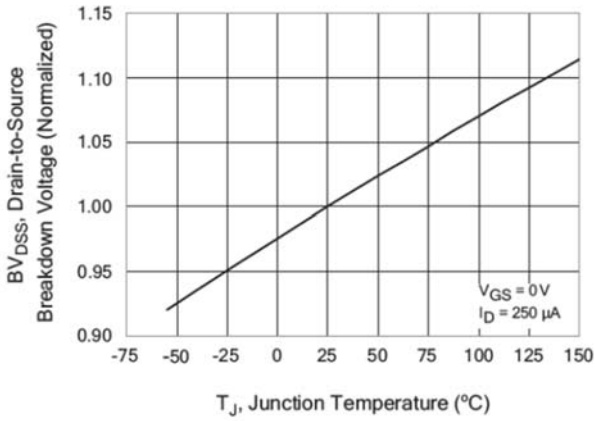


Fig 12. Typical Threshold Voltage vs Junction Temperature

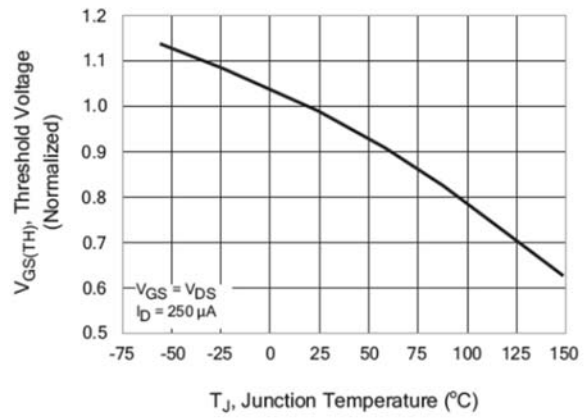


Fig 13. Maximum Safe Operating Area

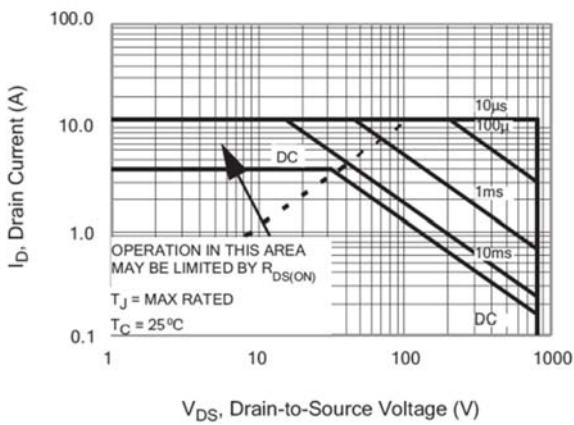


Fig 14. Typical Capacitance vs Drain-to-Source Voltage

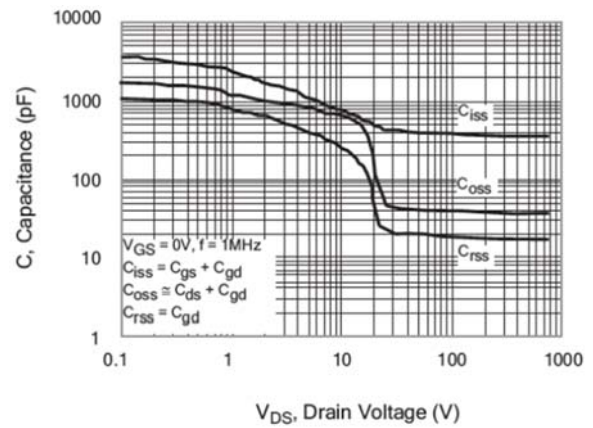


Fig 15. Typical Gate Charge vs Gate-to-Source Voltage

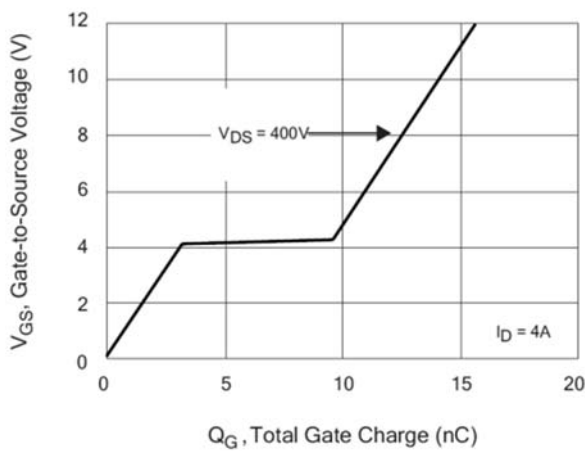
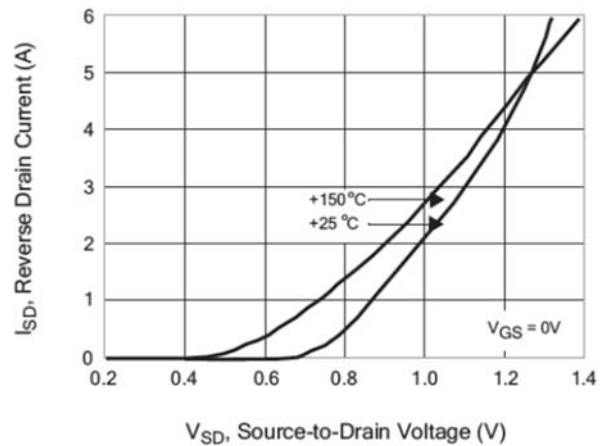


Fig 16. Typical Body Diode Transfer Characteristics





**TEST CIRCUITS AND WAVEFORMS**

Fig 17. Peak Diode Recovery dv/dt Test Circuit

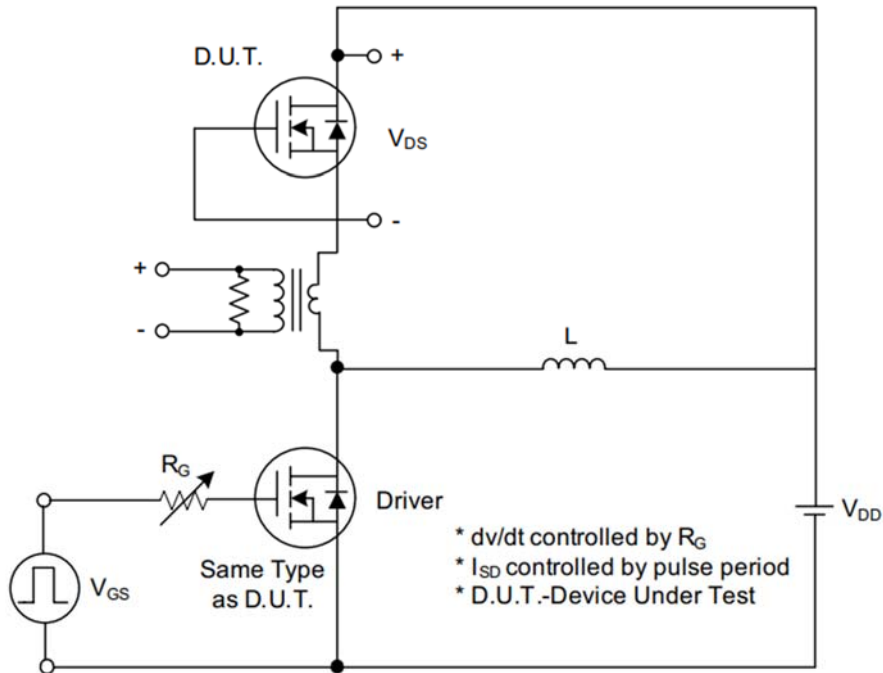


Fig 18. Peak Diode Recovery dv/dt Waveforms

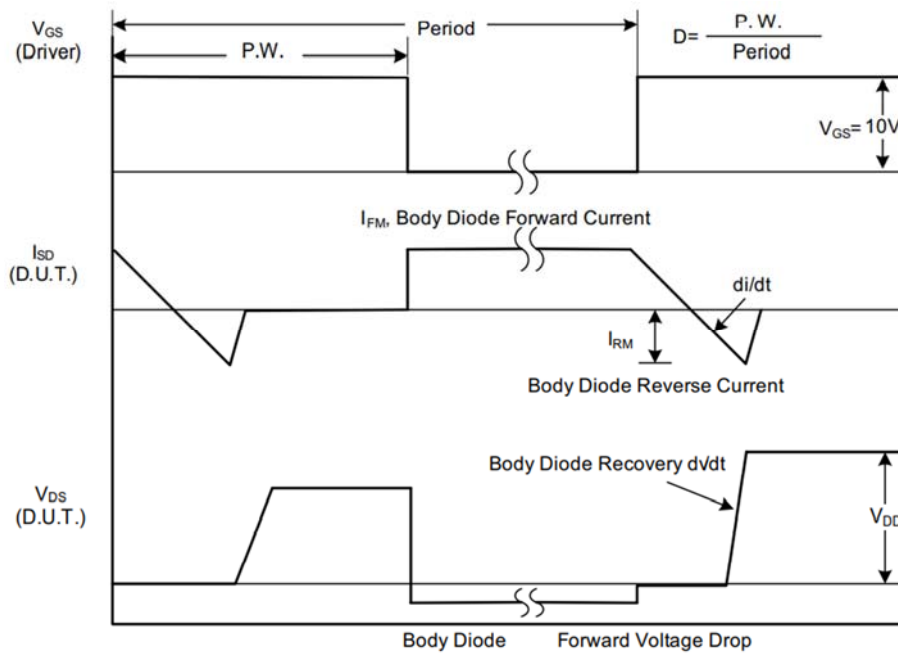




Fig 19. Switching Test Circuit

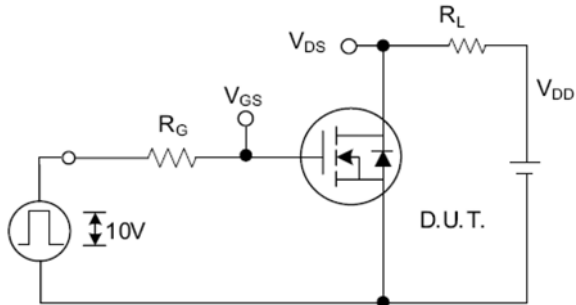


Fig 20. Switching Waveforms

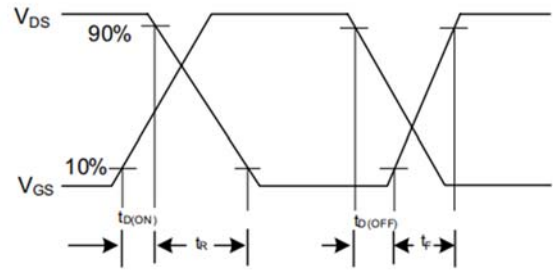


Fig 21. Gate Charge Test Circuit

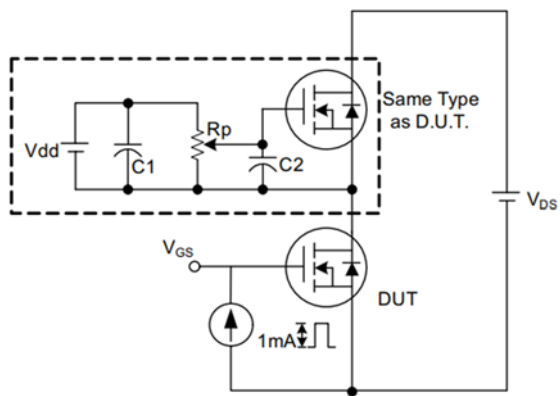


Fig 22. Gate Charge Waveform

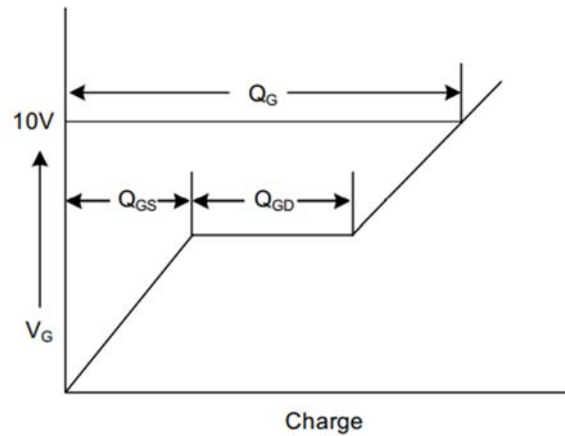


Fig 23. Unclamped Inductive Switching Test Circuit

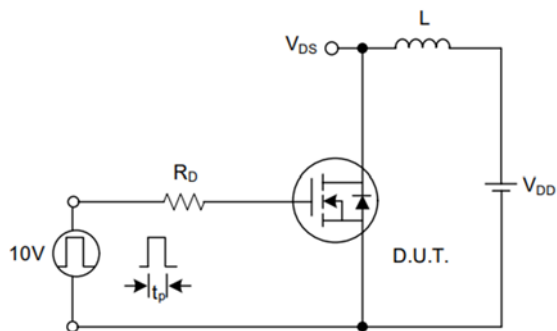
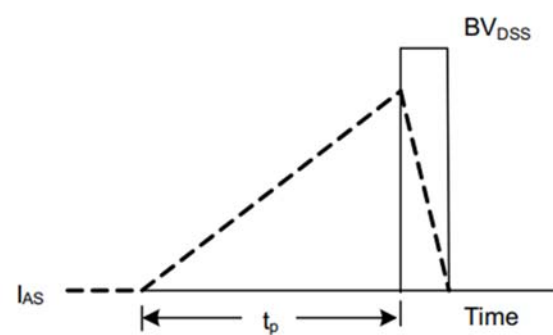


Fig 24. Unclamped Inductive Switching Waveforms

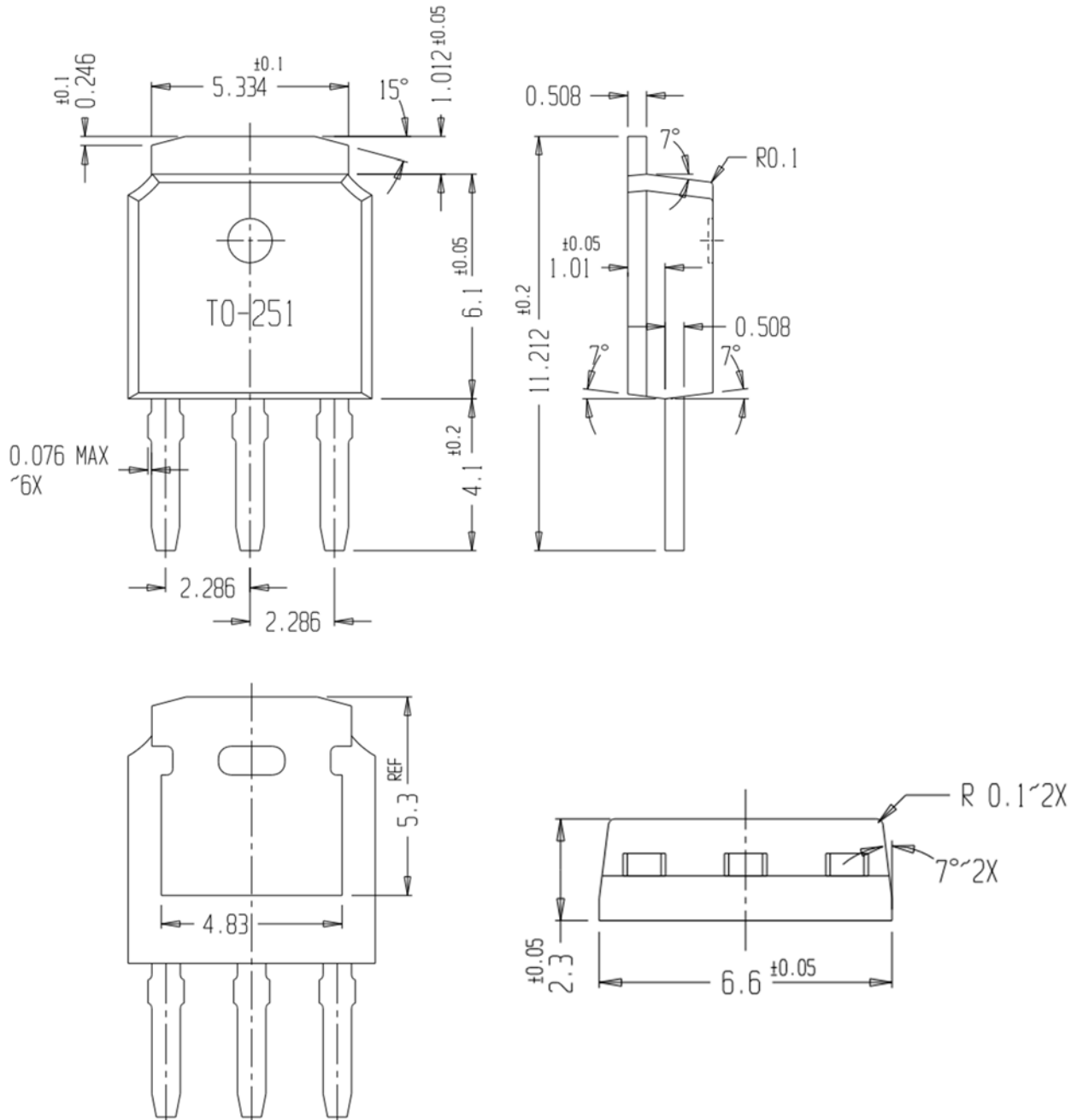






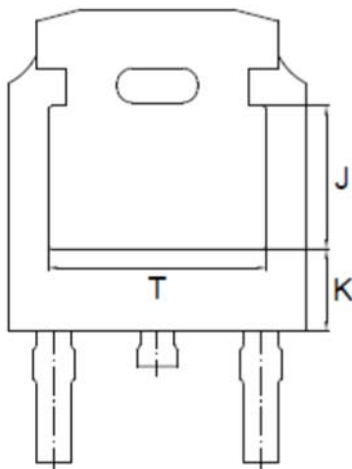
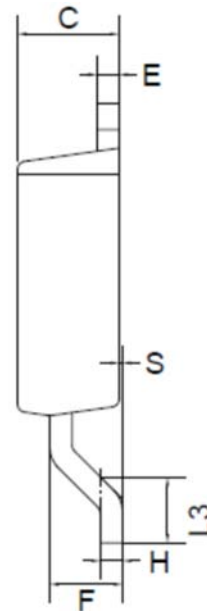
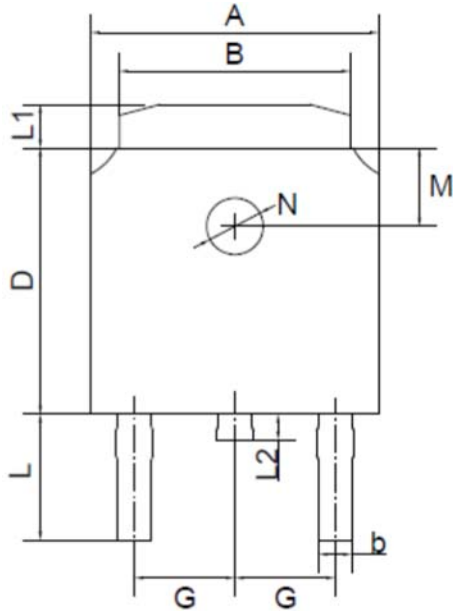
**PACKAGE INFORMATION**

Dimension in TO-251 (Unit: mm)





Dimension in TO-252 (Unit: mm)



Symbol	Min.	Max.
A	6.3	6.7
B	5.1	5.5
b	0.3	0.8
C	2.1	2.5
D	5.9	6.3
E	0.4	0.6
F	1.3	1.8
G	2.29 TYPICAL	
H	0.45	0.55
L	2.7	3.1
L1	0.8	1.2
L2	0.6	1.0
L3	1.40	1.75
S	0.0	0.1
M	1.8 TYPICAL	
N	1.3 TYPICAL	
J	3.16 ref.	
K	1.80 ref.	
T	4.83 ref.	



## IMPORTANT NOTICE

AiT Semiconductor Inc. (AiT) reserves the right to make changes to any its product, specifications, to discontinue any integrated circuit product or service without notice, and advises its customers to obtain the latest version of relevant information to verify, before placing orders, that the information being relied on is current.

AiT Semiconductor Inc. integrated circuit products are not designed, intended, authorized, or warranted to be suitable for use in life support applications, devices or systems or other critical applications. Use of AiT products in such applications is understood to be fully at the risk of the customer. As used herein may involve potential risks of death, personal injury, or server property, or environmental damage. In order to minimize risks associated with the customer's applications, the customer should provide adequate design and operating safeguards.

AiT Semiconductor Inc. assumes to no liability to customer product design or application support. AiT warrants the performance of its products of the specifications applicable at the time of sale.