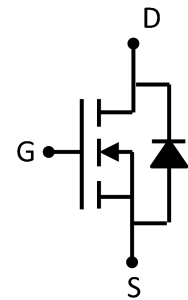


## Feature

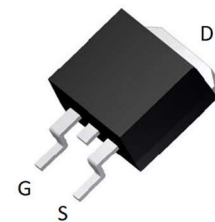
- 55V,110A  
 $R_{DS(ON)} < 10.0m\Omega @ V_{GS}=10V$  TYP:7 m $\Omega$
- Advanced Planar stripe DMOS Technology
- Lead free product is acquired
- Excellent  $R_{DS(ON)}$  and Low Gate Charge
- $T_{jmax}=175^{\circ}C$
- AEC-Q101 qualified



Schematic diagram

## Application

- PWM applications
- Load Switch
- Power management



TO-263

## Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity (PCS)
3205D-AU	AP3205D-AU	TO-263	-	-	800

## ABSOLUTE MAXIMUM RATINGS ( $T_J=25^{\circ}C$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	$V_{DS}$	55	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Continuous Drain Current ( $T_C=25^{\circ}C$ )	$I_D$	110	A
Avalanche Current <sup>(1)</sup>	$I_{AS}$	62	A
Pulsed Drain Current <sup>(1)</sup>	$I_{DM}$	390	A
Single Pulsed Avalanche Energy <sup>(2)</sup>	$E_{AS}$	484	mJ
Repetitive Avalanche Energy <sup>(2)</sup>	$E_{AR}$	20	mJ
Power Dissipation	$P_D$	200	W
Thermal Resistance from Junction to Case	$R_{\theta JC}$	0.75	$^{\circ}C/W$
Thermal Resistance from Junction to Ambient	$R_{\theta JA}$	40	$^{\circ}C/W$
Junction Temperature	$T_J$	175	$^{\circ}C$
Storage Temperature	$T_{STG}$	-55~ +175	$^{\circ}C$

**MOSFET ELECTRICAL CHARACTERISTICS(T<sub>J</sub>=25°C unless otherwise noted)**

Parameter	Symbol	Test Condition	Min	Type	Max	Unit
<b>Static Characteristics</b>						
Drain-source breakdown voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> = 0V, I <sub>D</sub> =250μA	55	-	-	V
Zero gate voltage drain current	I <sub>DSS</sub>	V <sub>DS</sub> =55V, V <sub>GS</sub> = 0V	-	-	1	μA
Gate-body leakage current	I <sub>GSS</sub>	V <sub>GS</sub> = ±20V, V <sub>DS</sub> = 0V	-	-	±100	nA
Gate threshold voltage <sup>(3)</sup>	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	2.0	-	4.0	V
Drain-source on-resistance <sup>(3)</sup>	R <sub>DS(on)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =30A	-	7.0	10.0	mΩ
<b>Dynamic characteristics</b>						
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =25V, V <sub>GS</sub> =0V, f =1.0MHz	-	3247	-	pF
Output Capacitance	C <sub>oss</sub>		-	780	-	
Reverse Transfer Capacitance	C <sub>rss</sub>		-	210	-	
<b>Switching characteristics</b>						
Turn-on delay time	t <sub>d(on)</sub>	V <sub>DD</sub> =28V, I <sub>D</sub> =62A, V <sub>GS</sub> =10V, R <sub>G</sub> =4.5Ω	-	14	-	ns
Turn-on rise time	t <sub>r</sub>		-	101	-	
Turn-off delay time	t <sub>d(off)</sub>		-	50	-	
Turn-off fall time	t <sub>f</sub>		-	65	-	
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> =44V, I <sub>D</sub> =62A, V <sub>GS</sub> =10V	-	-	146	nC
Gate-Source Charge	Q <sub>gs</sub>		-	-	35	
Gate-Drain Charge	Q <sub>gd</sub>		-	-	54	
<b>Source-Drain Diode characteristics</b>						
Diode Forward voltage <sup>(3)</sup>	V <sub>DS</sub>	V <sub>GS</sub> =0V, I <sub>S</sub> =62A	-	-	1.3	V
Diode Forward current <sup>(4)</sup>	I <sub>S</sub>		-	-	110	A
Body Diode Reverse Recovery Time	t <sub>rr</sub>	T <sub>J</sub> =25° , I <sub>F</sub> =62A, di/dt=100A/us		69		ns
Body Diode Reverse Recovery Charge	Q <sub>rr</sub>	T <sub>J</sub> =25° , I <sub>F</sub> =62A, di/dt=100A/us		143		nc

**Notes:**

1. Repetitive Rating: pulse width limited by maximum junction temperature
2. EAS Condition: T<sub>J</sub>=25°C, V<sub>DD</sub>=50V, R<sub>G</sub>=25 Ω, L=0.5Mh, I<sub>AS</sub>=44A
3. Pulse Test: pulse width≤300μs, duty cycle≤2%
4. Surface Mounted on FR4 Board, t≤10 sec

Test circuits and waveforms

Figure A: Gate Charge Test Circuit & Waveforms

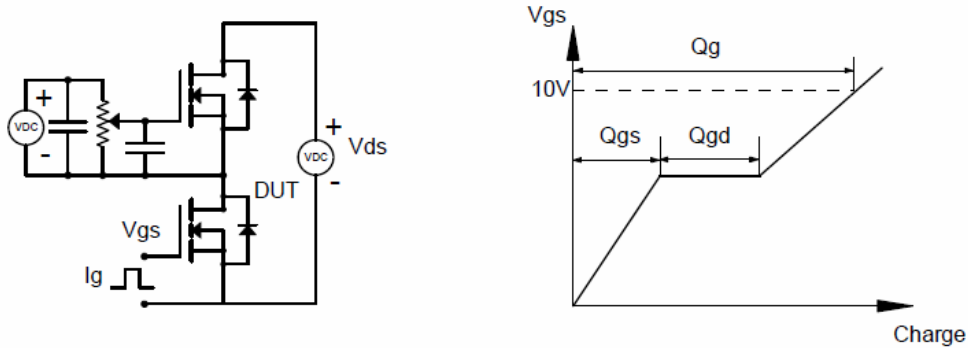


Figure B: Resistive Switching Test Circuit & Waveforms

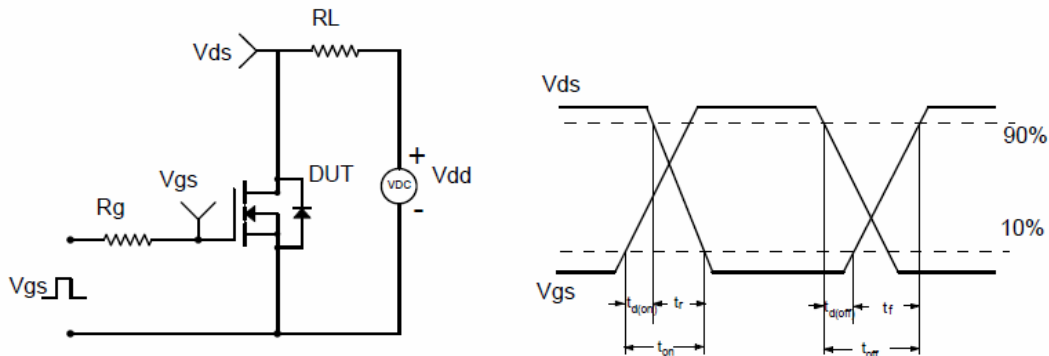


Figure C: Unclamped Inductive Switching (UIS) Test

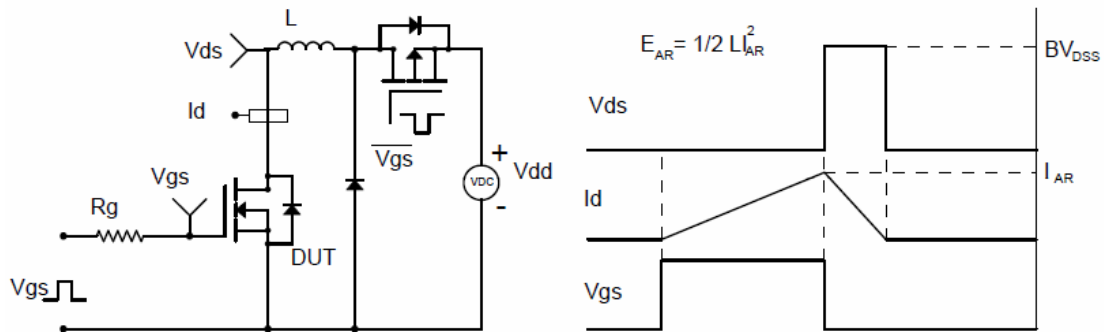
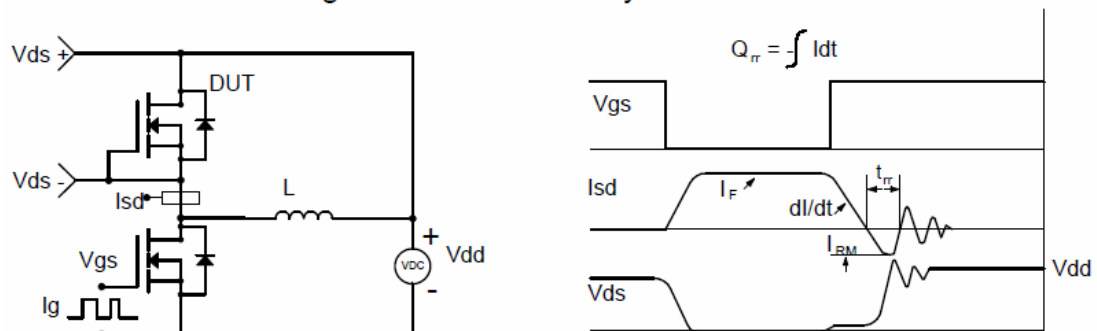
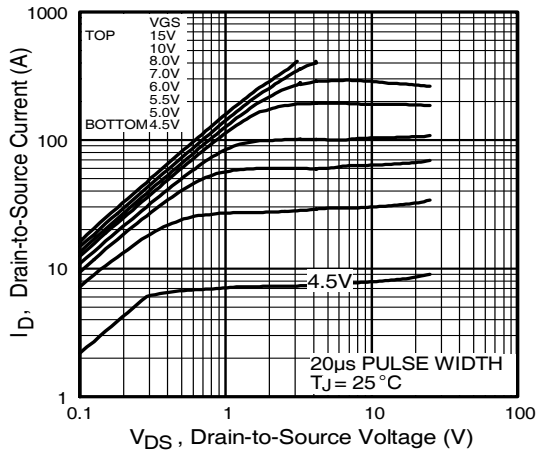


Figure D: Diode Recovery Test Circuit & Waveforms

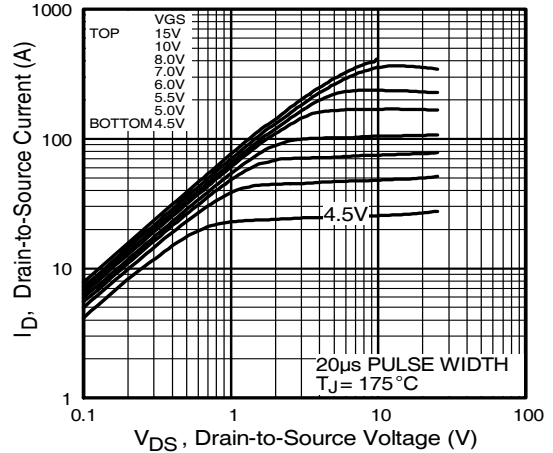


**Typical Electronic and Thermal Characteristics**

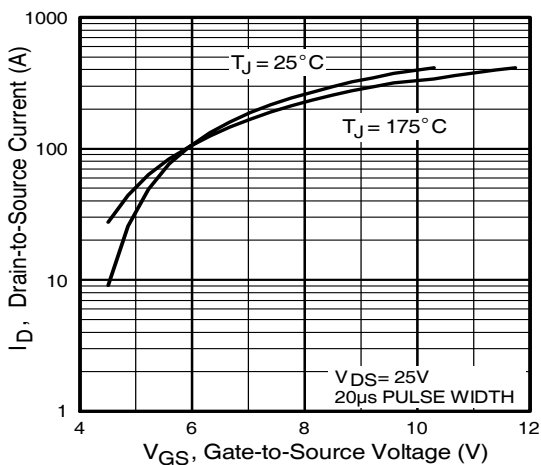
**Fig 1. Typical Output Characteristics**



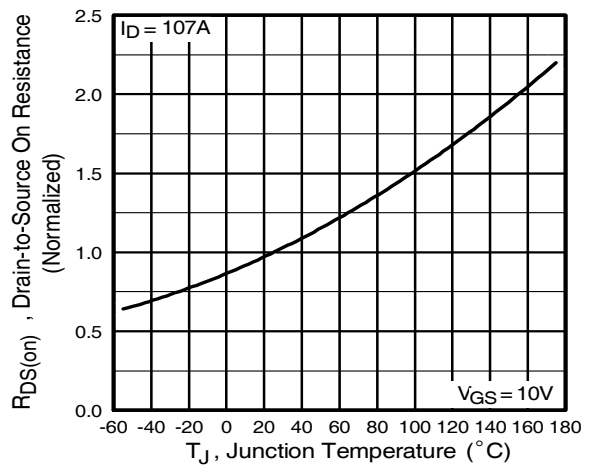
**Fig 2. Typical Output Characteristics**



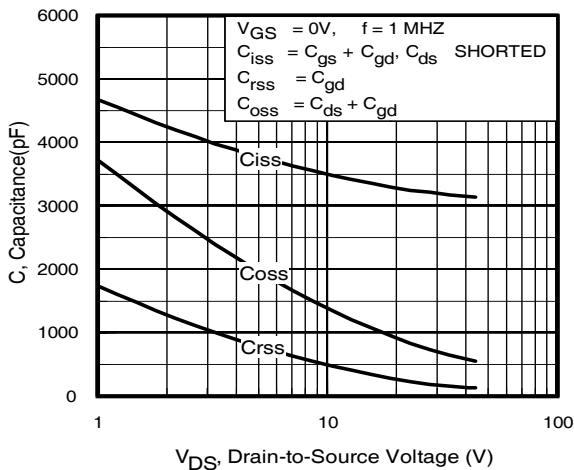
**Fig 3. Typical Transfer Characteristics**



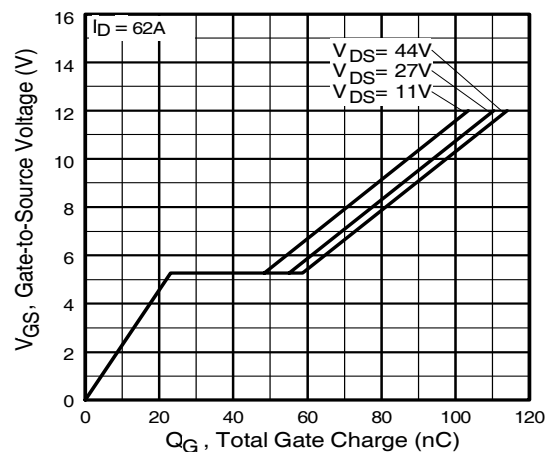
**Fig 4. Normalized On-Resistance Vs. Temperature**



**Fig 5. Typical Capacitance Vs. Drain-to-Source Voltage**

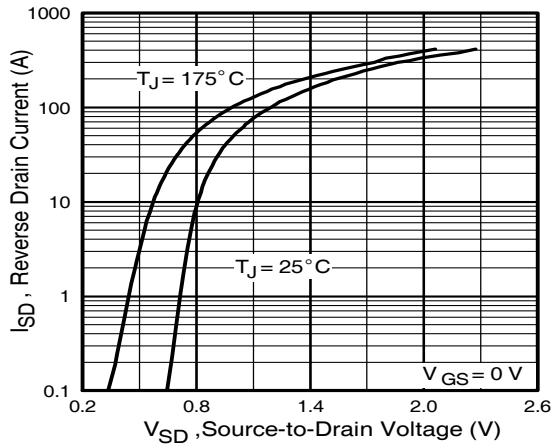


**Fig 6. Typical Gate Charge Vs. Gate-to-Source Voltage**

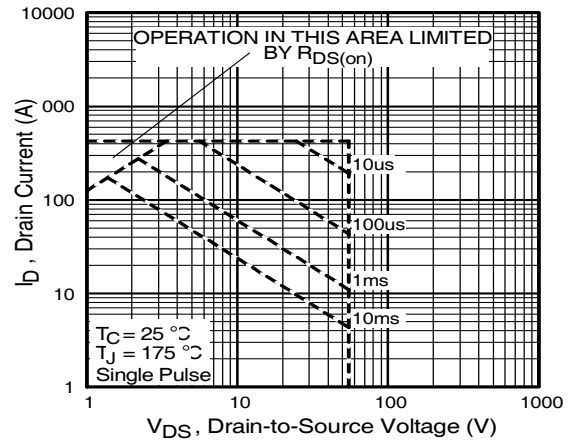


**Typical Electronic and Thermal Characteristics**

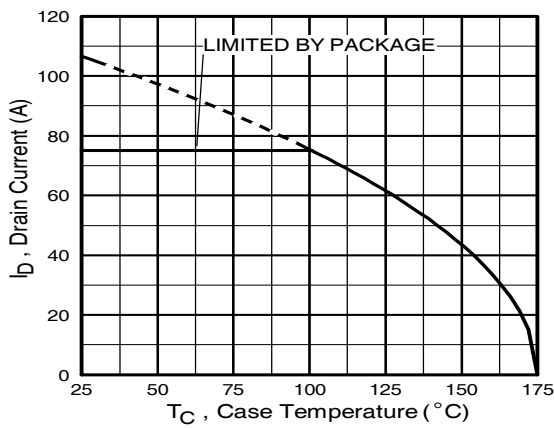
**Fig 7.** Typical Source-Drain Diode Forward Voltage



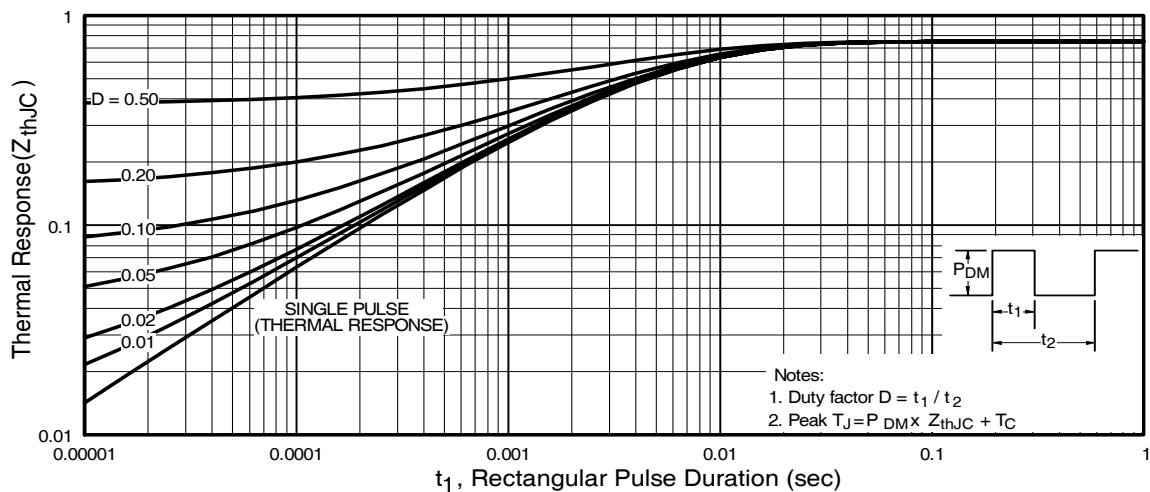
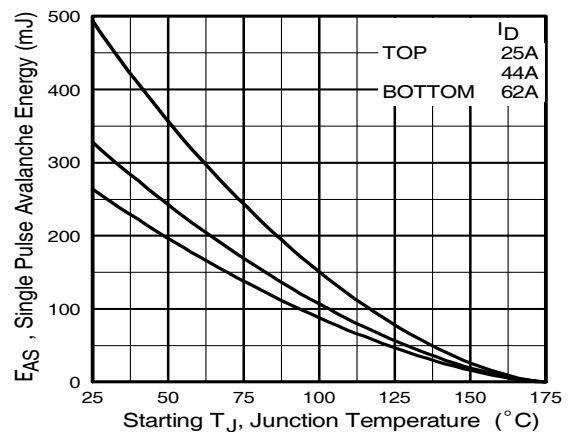
**Fig 8.** Maximum Safe Operating Area



**Fig 9.** Maximum Drain Current Vs. Case Temperature

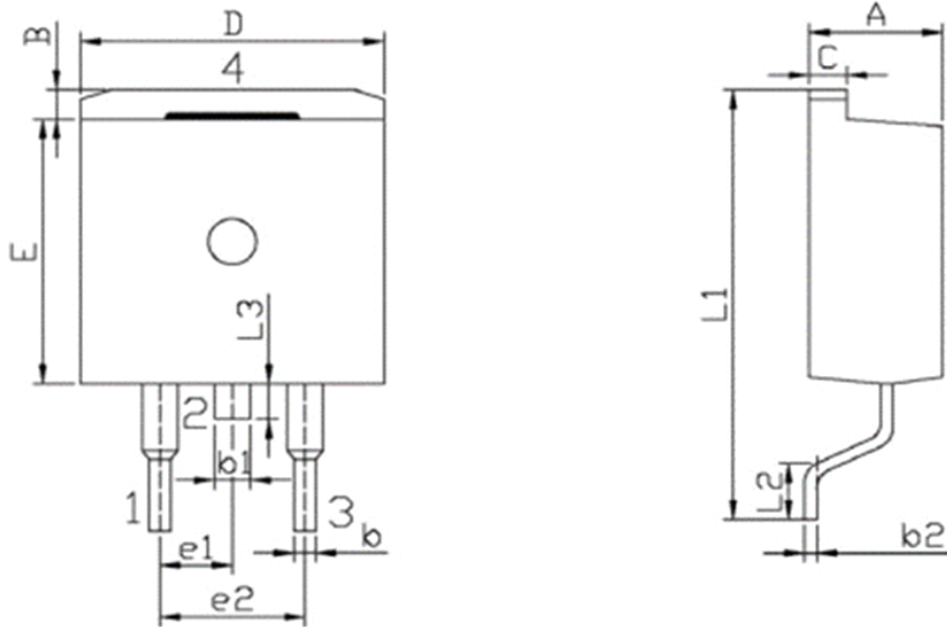


**Fig 10.** Maximum Avalanche Energy v Vs. Drain Current



**Fig 11.** Maximum Effective Transient Thermal Impedance, Junction-to-Case

**TO-263 Package Information**



单位: mm

Symbol	Dimensions In Millimeters		Symbol	Dimensions In Millimeters	
	Min	Max		Min	Max
A	4.30	4.70	E	9.00	9.40
B	1.00	1.40	e1	2.34	2.74
b	0.70	0.90	e2	4.88	5.28
b1	1.15	1.35	L1	15.00	16.00
b2	0.40	0.60	L2	2.24	2.84
C	1.20	1.40	L3	1.20	1.60
D	9.80	10.20			

## Revision History

Revision	Release	Remark
V1.0	2022/12/15	Initial Release

## Disclaimer

The information given in this document describes the independent performance of the product, but similar performance is not guaranteed under other working conditions, and cannot be guaranteed when installed with other products or equipment. To achieve the required performance of the product in actual scenarios, the customer should conduct a complete application test to assess the functionality of the product.

Allpower assumes no responsibility for equipment failures result from using products at values that exceed the ratings, operating conditions, or other parameters listed in the product specifications.

The product described in this specification is not applicable for aerospace or other applications which requires high reliability. Customers using or selling these products for use in medical, life-saving, or life-sustaining applications do so at their own risk and agree to fully indemnify.

Due to product or technical improvements, the information described or contained herein may be changed without prior notice.