

**DESCRIPTION**

The AM45P04D is available in TO-252 Package.

VDSS	RDS(ON)	ID
-40V	8.9 mΩ	-45A

APPLICATIONS

- Load Switch
- PWM Application
- Power Management

ORDERING INFORMATION

Package Type	Part Number	
TO-252 SPQ: 2,500pcs/Reel	D	AM45P04DVR
Note	R: Tape & Reel V: Halogen free Package	
AiT provides all RoHS products		

ABSOLUTE MAXIMUM RATINGS

T_J = 25°C, unless otherwise specified.

V _{DS} , Drain-to-Source Voltage	-40V	
V _{GS} , Gate-to-Source Voltage	±20V	
I _D , Continuous Drain Current	T _C = 25°C	-45A
	T _C = 100°C	-27A
I _{DM} , Pulsed Drain Current ⁽¹⁾	-180A	
E _{AS} , Single Pulse Avalanche Energy ⁽²⁾	100mJ	
P _D , Power Dissipation	T _C = 25°C	40W
R _{θJC} , Thermal Resistance, Junction to Case	3.1°C/W	
T _{STG} , Storage Temperature Range	-55°C ~ +150°C	
T _J , Junction Temperature Range	-55°C ~ +150°C	

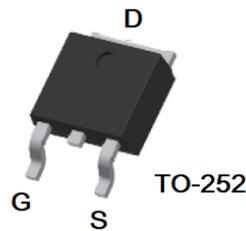
Stresses above may cause permanent damage to the device. These are stress ratings only and functional operation of the device at these or any other conditions beyond those indicated in the Electrical Characteristics are not implied. Exposure to absolute maximum rating conditions for extended periods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

(1) Repetitive Rating: pulse width limited by maximum junction temperature.

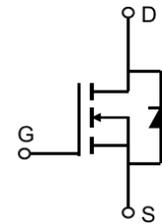
(2) E_{AS} condition: Starting T_J=25°C, V_{DD}=20V, V_G=10V, R_G=25ohm, L=0.5mH, I_{AS}=17A

FEATURE

- -40V, -45A
- R_{DS(ON)} Typ. = 8.9mΩ @ V_{GS} = -10V
- R_{DS(ON)} Typ. = 12.8mΩ @ V_{GS} = -4.5V
- Advanced Trench Technology
- Excellent R_{DS(ON)} and Low Gate Charge

PIN DESCRIPTION

TO-252



Pin #	Symbol	Function
1	G	Gate
2,4	D	Drain
3	S	Source



ELECTRICAL CHARACTERISTICS

T_J = 25°C, unless otherwise specified.

Parameter	Symbol	Conditions	Min	Typ.	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	V _{(BR)DSS}	V _{GS} = 0V, I _D = -250μA	-40	-	-	V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = -40V, V _{GS} = 0V	-	-	-1	μA
Gate-Body Leakage Current	I _{GSS}	V _{GS} = ±20V, V _{DS} = 0V	-	-	±100	nA
On Characteristics						
Gate Threshold Voltage	V _{GS(TH)}	V _{DS} = V _{GS} , I _D = -250μA	-1.1	-1.5	-2.2	V
Static Drain-Source ON-Resistance *	R _{DS(ON)}	V _{GS} = -10V, I _D = -15A	-	8.9	11.6	mΩ
		V _{GS} = -4.5V, I _D = -10A	-	12.8	16.6	
Dynamic Characteristics						
Input Capacitance	C _{iss}	V _{DS} = -20V, V _{GS} = 0V, f = 1.0MHz	-	1997	-	pF
Output Capacitance	C _{oss}		-	258	-	
Reverse Transfer Capacitance	C _{rss}		-	205	-	
Total Gate Charge	Q _g	V _{DS} = -20V, I _D = -11V V _{GS} = 0V ~ -10V	-	35	-	nC
Gate-Source Charge	Q _{gs}		-	6.2	-	
Gate-Drain Charge	Q _{gd}		-	7.3	-	
Switching Characteristics						
Turn-On Delay Time	t _{d(on)}	V _{DD} = -20V, I _D = -11A R _{GEN} = 2.5Ω, V _{GS} = -10V,	-	10	-	ns
Turn-On Rise Time	t _r		-	20	-	
Turn-Off Delay Time	t _{d(off)}		-	51	-	
Turn-Off Fall Time	t _f		-	28	-	
Reverse Diode						
Maximum Continuous Drain to Source Diode Forward Current	I _S	-	-	-	-45	A
Maximum Pulsed Drain to Source Diode Forward Current	I _{SM}	-	-	-	-180	A
Drain to Source Diode Forward Voltage	V _{SD}	I _S = -11A, V _{GS} = 0V	-	-	1.2	V
Body Diode Reverse Recovery Time	t _{rr}	I _F = -11A di/dt = 100A/us	-	35	-	ns
Body Diode Reverse Recovery Charge	Q _{rr}		-	40	-	nC

* Pulse test: Pulse width ≤ 300μs, Duty Cycle ≤ 2%.



TEST CIRCUIT

Fig 1. Gate Charge Test Circuit & Waveform

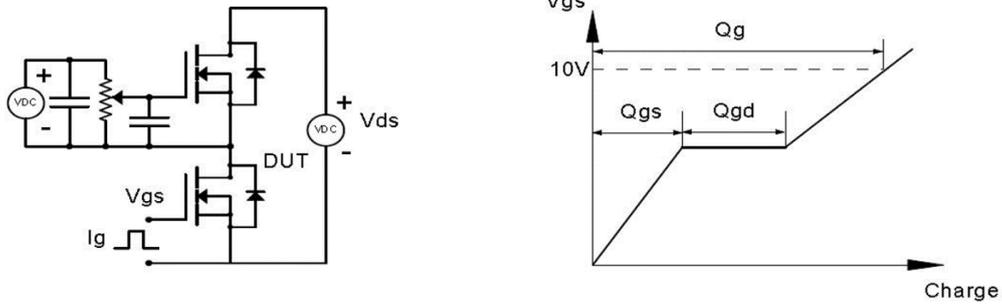


Fig 2. Resistive Switching Test Circuit & Waveforms

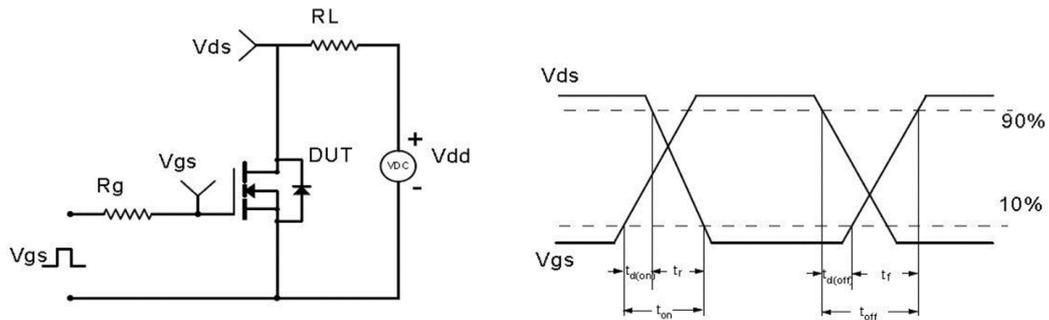


Fig 3. Unclamped Inductive Switching (UIS) Test Circuit & Waveforms

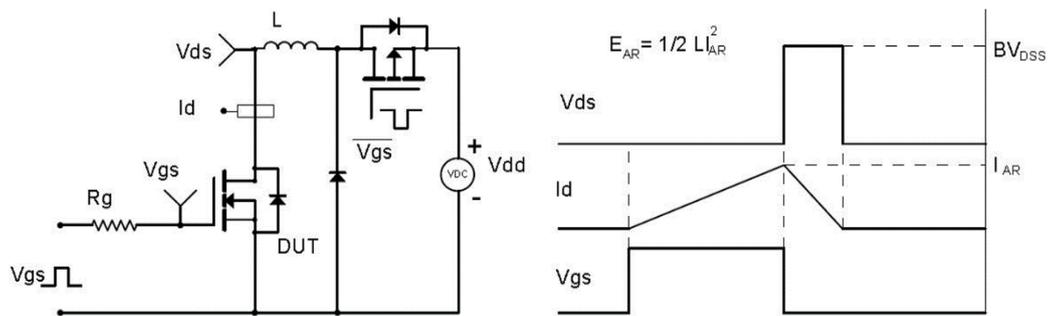
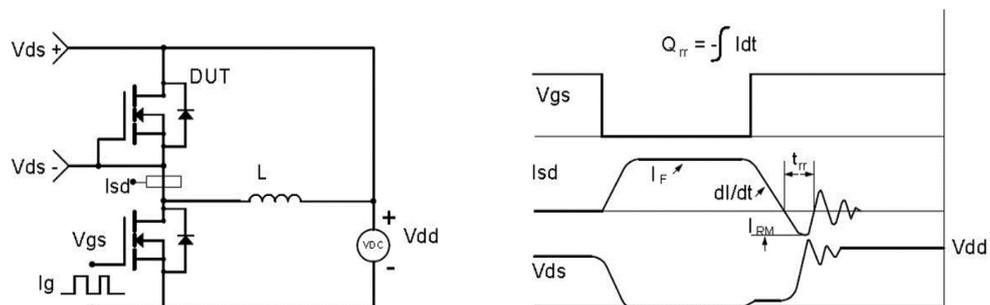


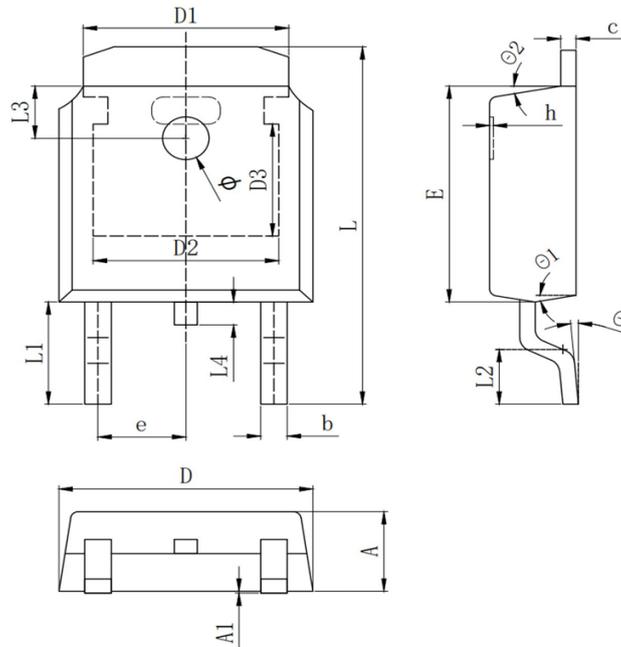
Fig 4. Diode Recovery Test Circuit & Waveforms





PACKAGE INFORMATION

Dimension in TO-252 (Unit: mm)



Symbol	Millimeters	
	Min.	Max.
A	2.200	2.400
A1	0.000	0.127
b	0.640	0.740
c	0.460	0.580
D	6.500	6.700
D1	5.334 REF.	
D2	4.826 REF.	
D3	3.166 REF.	
E	6.000	6.200
e	2.286 REF.	
h	0.000	0.200
L	9.900	10.300
L1	2.888 REF.	
L2	1.400	1.700
L3	1.600 REF.	
L4	0.600	1.000
φ	1.100	1.300
θ	0°	8°
θ1	9° TYP.	
θ2	9° TYP.	



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