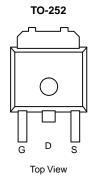


AOD454Y-VB Datasheet N-Channel 40-V (D-S) MOSFET

PRODUCT SUMMARY						
V _{DS} (V)	$R_{DS(on)}(\Omega)$	I _D (A) ^{a, e}	Q _g (Typ)			
40	0.012 at V _{GS} = 10 V	55	42 nC			
40	0.014 at $V_{GS} = 4.5 \text{ V}$	45	42 110			



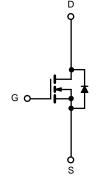
FEATURES

- Trench Power MOSFET
- 100 % R_g and UIS Tested
- Compliant to RoHS Directive 2011/65/EU





- OR-ing
- Server
- DC/DC



N-Channel MOSFET

Parameter	Symbol	Limit	Unit		
Drain-Source Voltage	V _{DS}	40	V		
Gate-Source Voltage	V _{GS}	± 20			
	T _C = 25 °C		55 ^{a, e}		
Continuous Drain Current (T _J = 175 °C)	T _C = 70 °C		45 ^e		
Continuous Diain Current (1, = 175°C)	T _A = 25 °C	I _D	15.8 ^{b, c}		
	T _A = 70 °C		12 ^{b, c}	^	
Pulsed Drain Current	I _{DM}	200			
Avalanche Current Pulse	L = 0.1 mH	I _{AS}	39		
Single Pulse Avalanche Energy	L = 0.1 IIII	E _{AS}	94.8	mJ	
Continuous Source-Drain Diode Current	T _C = 25 °C	I _S	90 ^{a, e}	А	
Continuous Source-Drain Diode Current	T _A = 25 °C	'S	3.13 ^{b, c}	A	
	T _C = 25 °C		100 ^a		
Maximum Pawar Dissination	T _C = 70 °C	P _D	75	10/	
Maximum Power Dissipation	T _A = 25 °C	r _D	3.75 ^{b, c}	W	
	T _A = 70 °C		2.63 ^{b, c}		
Operating Junction and Storage Temperature R	T _J , T _{stg}	- 55 to 175	°C		

THERMAL RESISTANCE RATINGS						
Parameter		Symbol	Тур.	Max.	Unit	
Maximum Junction-to-Ambient ^{b, d}	t ≤ 10 sec	R _{thJA}	32	40	°C/W	
Maximum Junction-to-Case	Steady State	R _{thJC}	0.5	0.6]	

Notes:

- a. Based on T_C = 25 °C. b. Surface mounted on 1" x 1" FR4 board. c. t = 10 sec.
- d. Maximum under steady state conditions is 90 °C/W.
- e. Calculated based on maximum junction temperature. Package limitation current is 90 A.



Parameter	Symbol	Test Conditions	Min.	Тур.	Max.	Unit
Static						•
Drain-Source Breakdown Voltage	V _{DS}	$V_{GS} = 0 \text{ V}, I_D = 250 \mu\text{A}$	40			V
V _{DS} Temperature Coefficient	$\Delta V_{DS}/T_{J}$	I _D = 250 μA		35		m\//9/
V _{GS(th)} Temperature Coefficient	$\Delta V_{GS(th)}/T_J$	I _D = 250 μA		- 7.5		mV/°C
Gate-Source Threshold Voltage	V _{GS(th)}	$V_{DS} = V_{GS}, I_D = 250 \mu A$	1.5		2.5	V
Gate-Source Leakage	I _{GSS}	$V_{DS} = 0 \text{ V}, V_{GS} = \pm 20 \text{ V}$			± 100	nA
Zero Gate Voltage Drain Current	I _{DSS}	$V_{DS} = 40 \text{ V}, V_{GS} = 0 \text{ V}$			1	
		V _{DS} = 40 V, V _{GS} = 0 V, T _J = 55 °C			10	μΑ
On-State Drain Current ^a	I _{D(on)}	$V_{DS} \ge 5 \text{ V}, V_{GS} = 10 \text{ V}$	90			Α
	D	V _{GS} = 10 V, I _D = 38.8 A		0.012		
Drain-Source On-State Resistance ^a	R _{DS(on)}	$V_{GS} = 4.5 \text{ V}, I_D = 37 \text{ A}$	0.014			Ω
Forward Transconductance ^a	9 _{fs}	V _{DS} = 15 V, I _D = 38.8 A		160		S
Dynamic ^b						
Input Capacitance	C _{iss}			1801		
Output Capacitance	C _{oss}	$V_{DS} = 15 \text{ V}, V_{GS} = 0 \text{ V}, f = 1 \text{ MHz}$		725		pF
Reverse Transfer Capacitance	C _{rss}			570		
Total Cata Channa	0	$V_{DS} = 15 \text{ V}, V_{GS} = 10 \text{ V}, I_D = 38.8 \text{ A}$		85	120	
Total Gate Charge	Q_g			42	62	nC
Gate-Source Charge	Q_{gs}	$V_{DS} = 15 \text{ V}, V_{GS} = 4.5 \text{ V}, I_{D} = 28.8 \text{ A}$		17		
Gate-Drain Charge	Q _{gd}			14		
Gate Resistance	R_g	f = 1 MHz		1.4	2.1	Ω
Turn-On Delay Time	t _{d(on)}			10	20	
Rise Time	t _r	V_{DD} = 15 V, R_L = 0.625 Ω		11	17	1
Turn-Off Delay Time	t _{d(off)}	$I_D\cong 24$ A, V_{GEN} = 10 V, R_g = 1 Ω		35	55	
Fall Time	t _f			10	15]
Turn-On Delay Time	t _{d(on)}			25	43	ns
Rise Time	t _r	V_{DD} = 15 V, R_L = 0.67 Ω		80	150	
Turn-Off Delay Time	t _{d(off)}	$I_D\cong 22.5~A,~V_{GEN}=4.5~V,~R_g=1~\Omega$		26	42	
Fall Time	t _f			12	18	
Drain-Source Body Diode Characteristic	es					
Continuous Source-Drain Diode Current	I _S	T _C = 25 °C			120	۸
Pulse Diode Forward Current ^a	I _{SM}				120	Α
Body Diode Voltage	V_{SD}	I _S = 22 A		0.8	1.2	V
Body Diode Reverse Recovery Time	t _{rr}			52	78	ns
Body Diode Reverse Recovery Charge	Q _{rr}	I _F = 20 A, di/dt = 100 A/μs, T _J = 25 °C		70.2	105	nC
Reverse Recovery Fall Time	t _a	1F - 20 A, αι/αι = 100 Αγμ5, 1J = 25 °C		27		
Reverse Recovery Rise Time	t _b	t _b		25		ns

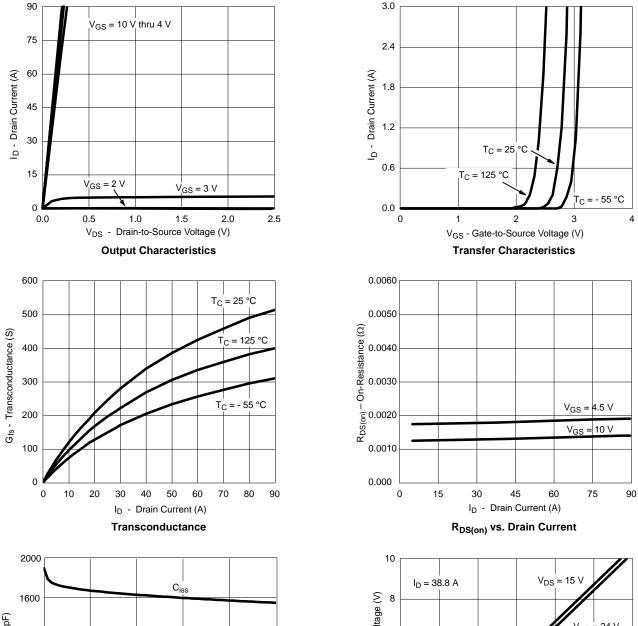
Notes:

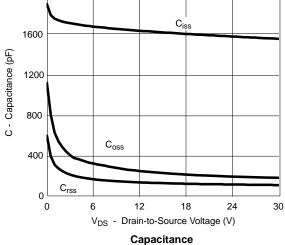
- a. Pulse test; pulse width $\leq 300~\mu s,$ duty cycle $\leq 2~\%.$
- b. Guaranteed by design, not subject to production testing.

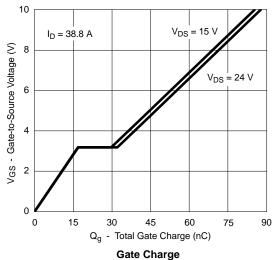
Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.



TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)

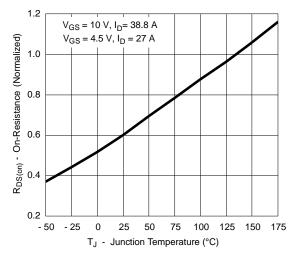




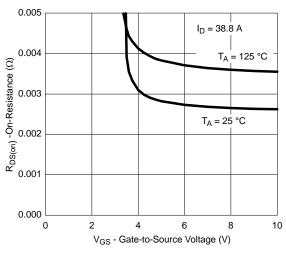




TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



On-Resistance vs. Junction Temperature



 $\rm R_{\rm DS(on)}$ vs. $\rm V_{\rm GS}$ vs. Temperature



Forward Diode Voltage vs. Temperature



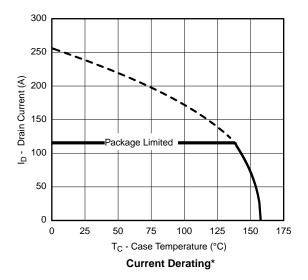
Threshold Voltage



Safe Operating Area, Junction-to-Ambient

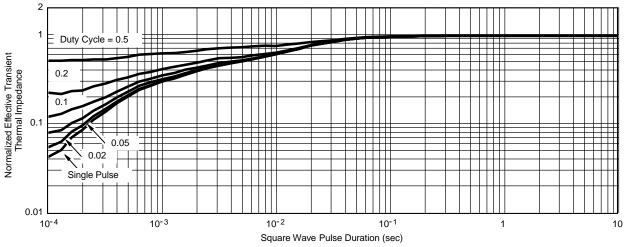


TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)





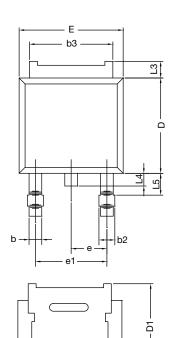
*The power dissipation P_D is based on $T_{J(max)}$ = 175 °C, using junction-to-case thermal resistance, and is more useful in settling the upper dissipation limit for cases where additional heatsinking is used. It is used to determine the current rating, when this rating falls below the package limit.



Normalized Thermal Transient Impedance, Junction-to-Case

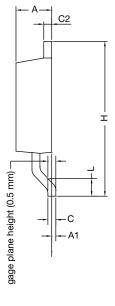


TO-252AA CASE OUTLINE



E1

6



	MILLIN	METERS	INCHES			
DIM.	MIN.	MAX.	MIN.	MAX.		
Α	2.18	2.38	0.086	0.094		
A1	-	0.127	-	0.005		
b	0.64	0.88	0.025	0.035		
b2	0.76	1.14	0.030	0.045		
b3	4.95	5.46	0.195	0.215		
С	0.46	0.61	0.018	0.024		
C2	0.46	0.89	0.018	0.035		
D	5.97	6.22	0.235	0.245		
D1	5.21	-	0.205	-		
Е	6.35	6.73	0.250	0.265		
E1	4.32	-	0.170	-		
Н	9.40	10.41	0.370	0.410		
е	2.28	BSC 0.090 BS		BSC		
e1	4.56 BSC		0.180 BSC			
L	1.40	1.78	0.055	0.070		
L3	0.89	1.27	0.035	0.050		
L4	-	1.02	-	0.040		
L5	1.14	1.52	0.045	0.060		
ECN: Y12-0247-Rev. M. 24-Dec-12						

ECN: X12-0247-Rev. M, 24-Dec-12 DWG: 5347

Note

• Dimension L3 is for reference only.



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