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AOD4132

N-Channel Enhancement Mode Power MOSFET

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Features

- 30V, 90A
  $R_{DS(ON)}$ 3.88mΩ@V_{GS} = 10V (Typ)
- Advanced Trench Technology
- Provide Excellent $R_{DS(ON)}$ and Low Gate Charge
- Lead free product is acquired

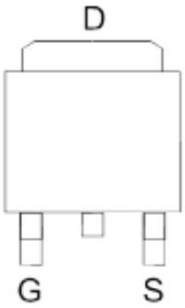
Application

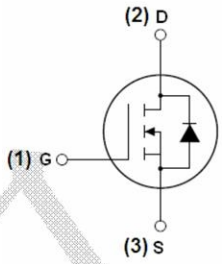
- Load Switch
- PWM Application
- Power management

Package and Pin Configuration

(TO-252-3L)

Top View





Marking:

Absolute Maximum Ratings (T_C=25℃ unless otherwise specified)

Symbol	Parameter		Max.	Units
V_{DSS}	Drain-Source Voltage		30	V
V_{GSS}	Gate-Source Voltage		±20	V
I_D	Continuous Drain Current	T_C = 25℃	90	A
		T_C = 100℃	60	A
I_{DM}	Pulsed Drain Current note1		180	A
EAS	Single Pulsed Avalanche Energy note2		225	mJ
P_D	Power Dissipation	T_C = 25℃	181	W
$R_{\theta JC}$	Thermal Resistance, Junction to Case		0.83	℃/W
T_J, T_{STG}	Operating and Storage Temperature Range		-55 to +175	℃

Electrical Characteristics (T_J=25℃ unless otherwise specified)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
Off Characteristic						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=250μA	30	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=30V, V_{GS} = 0V,	-	-	1.0	μA
I_{GSS}	Gate to Body Leakage Current	V_{DS}=0V, V_{GS} = ±20V	-	-	±100	nA
On Characteristics						
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=250μA	0.8	1.4	2.0	V
$R_{DS(on)}$	Static Drain-Source on-Resistance	V_{GS}=10V, I_D=10A	-	3.88	5.0	mΩ
$R_{DS(on)}$	Static Drain-Source on-Resistance	V_{GS}=4.5V, I_D=8A	-	6.3	7.5	mΩ
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{DS}=20V, V_{GS}=0V, f=1.0MHz	-	5672	-	pF
C_{oss}	Output Capacitance		-	392	-	pF
C_{rss}	Reverse Transfer Capacitance		-	352	-	pF
Q_g	Total Gate Charge	V_{DS}=30V, I_D=30A, V_{GS}=10V	-	103	-	nC
Q_{gs}	Gate-Source Charge		-	15	-	nC
Q_{gd}	Gate-Drain(“Miller”) Charge		-	32	-	nC
Switching Characteristics						
$t_{d(on)}$	Turn-on Delay Time	V_{DS}=30V, I_D=30A, R_G=1.8Ω, V_{GS}=10V	-	12	-	ns
t_r	Turn-on Rise Time		-	8	-	ns
$t_{d(off)}$	Turn-off Delay Time		-	49	-	ns
t_f	Turn-off Fall Time		-	15	-	ns
Drain-Source Diode Characteristics and Maximum Ratings						
I_S	Maximum Continuous Drain to Source Diode Forward Current		-	-	90	A
I_{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	180	A
V_{SD}	Drain to Source Diode Forward Voltage	V_{GS}=0V, I_S=5A	-	0.78	1.0	V
trr	Body Diode Reverse Recovery Time	I_F=30A, dI/dt=100A/μs	-	27	-	ns
Qrr	Body Diode Reverse Recovery Charge		-	48	-	nC

Notes:1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature

2. EAS condition : T_J=25℃, V_{DD}=30V, V_G=10V, L=0.5mH, Rg=25Ω, I_{AS}=30A

3. Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%

Typical Electrical and Thermal Characteristic Curves

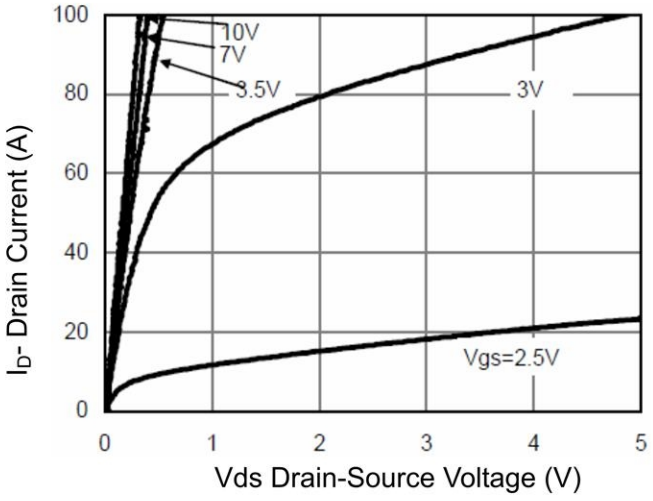


Figure 1 Output Characteristics

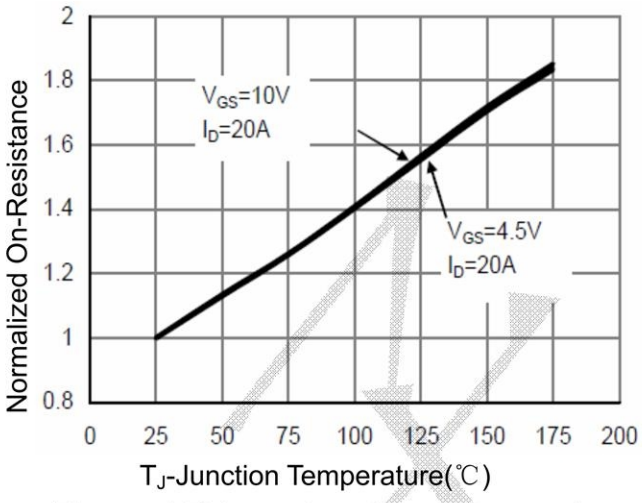


Figure 4 Rdson-Junction Temperature

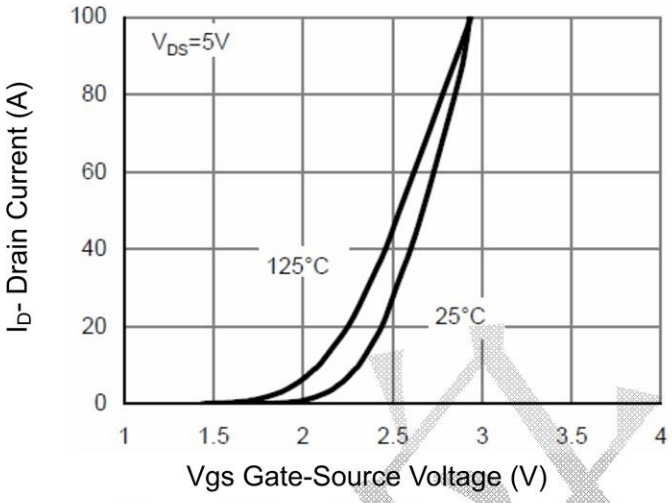


Figure 2 Transfer Characteristics

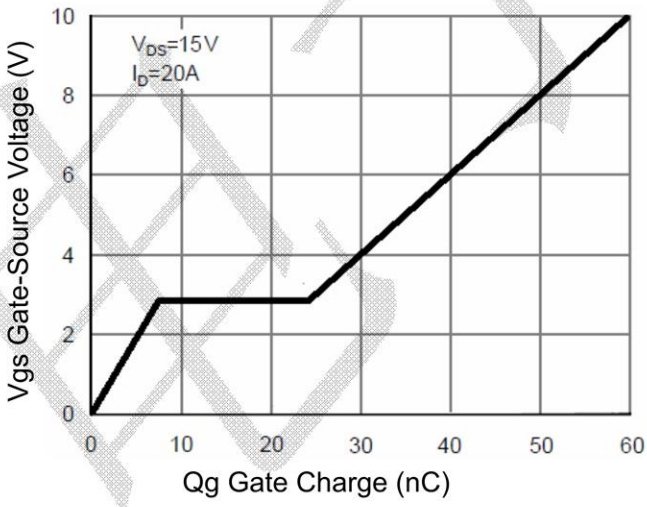


Figure 5 Gate Charge

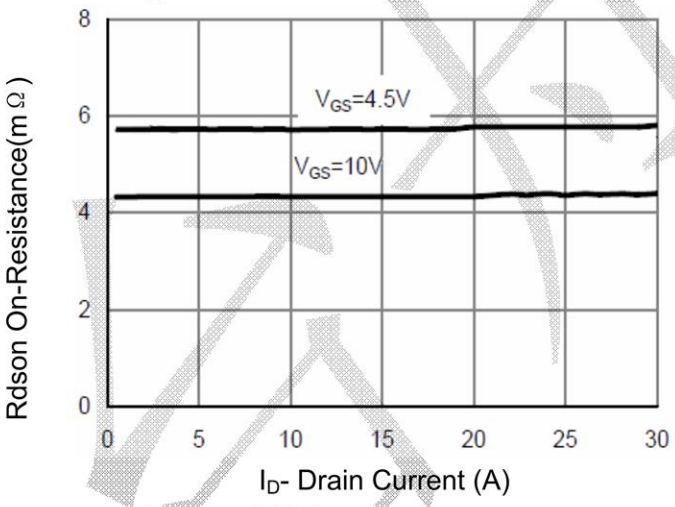


Figure 3 Rdson- Drain Current

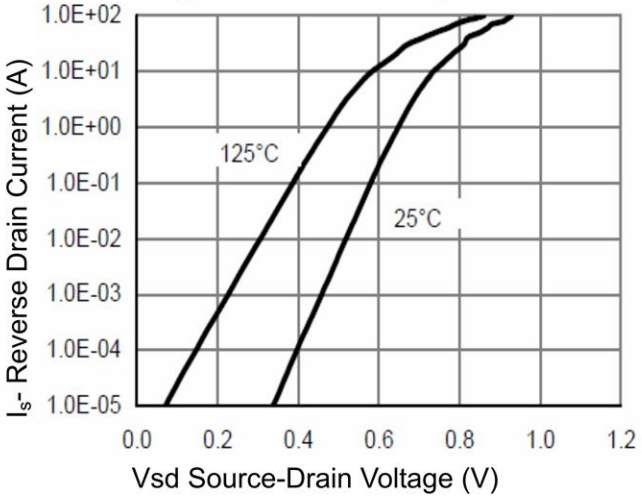


Figure 6 Source- Drain Diode Forward

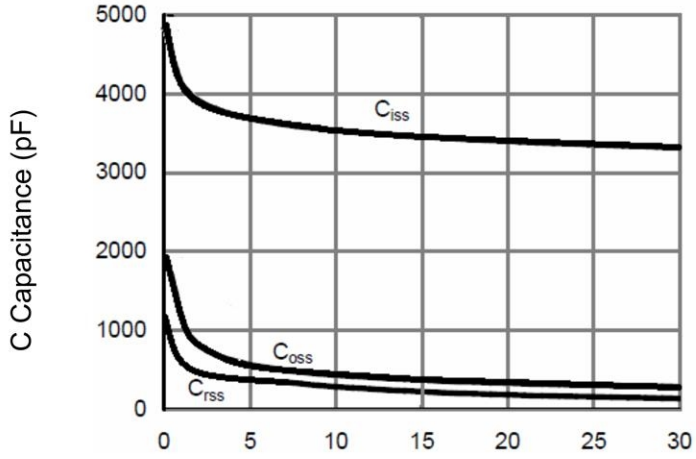


Figure 7 Capacitance vs Vds

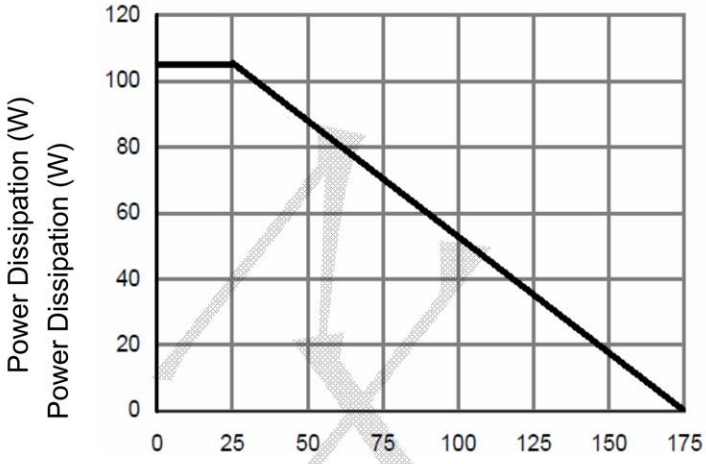


Figure 9 Power De-rating

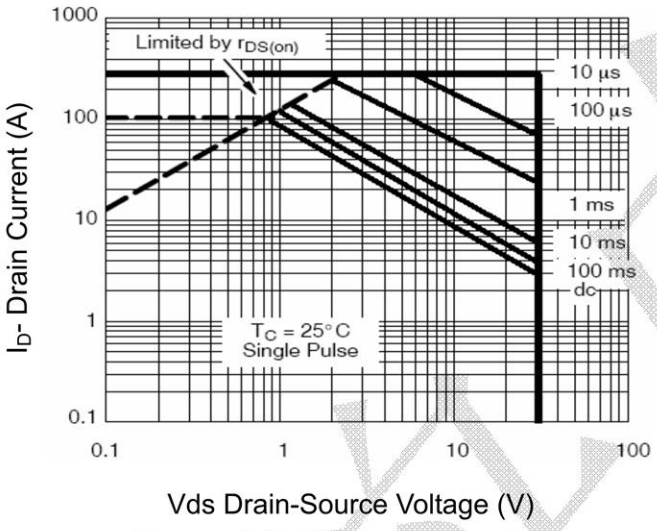


Figure 8 Safe Operation Area

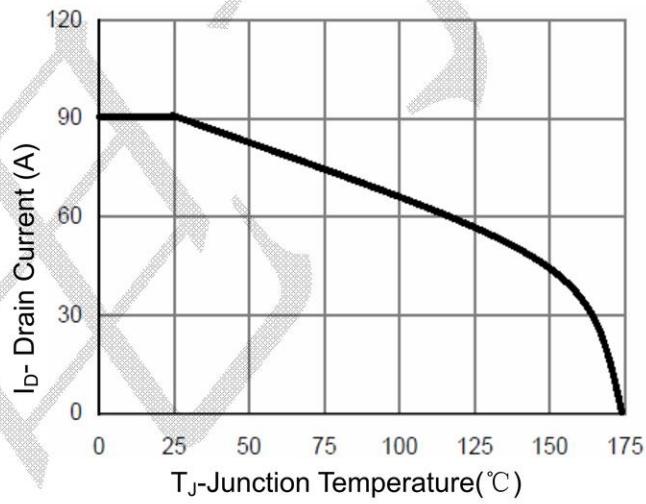


Figure 10 ID Current Derating

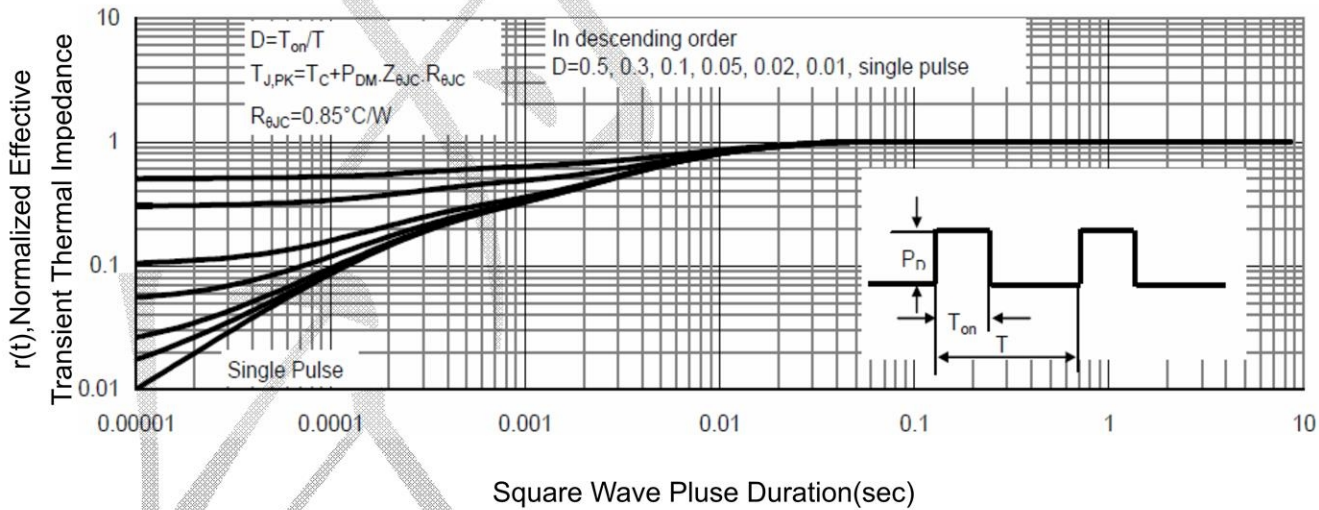
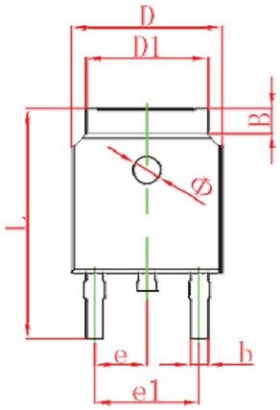
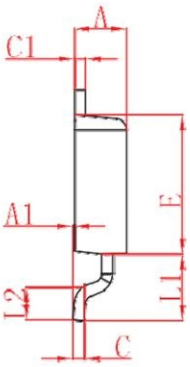
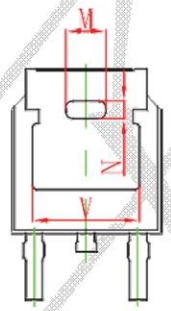


Figure 11 Normalized Maximum Transient Thermal Impedance

TO252 Package Information







Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.200	2.380	0.087	0.094
A1	0.000	0.100	0.000	0.004
B	0.800	1.400	0.031	0.055
b	0.710	0.810	0.028	0.032
c	0.460	0.560	0.018	0.022
c1	0.460	0.560	0.018	0.022
D	6.500	6.700	0.256	0.264
D1	5.130	5.460	0.202	0.215
E	6.000	6.200	0.236	0.244
e	2.286 TYP.		0.090 TYP.	
e1	4.327	4.727	0.170	0.186
M	1.778REF.		0.070REF.	
N	0.762REF.		0.018REF.	
L	9.800	10.400	0.386	0.409
L1	2.9REF.		0.114REF.	
L2	1.400	1.700	0.055	0.067
V	4.830 REF.		0.190 REF.	
[illegible]	1.100	1.300	0.043	0.0±1

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