ADR180N15S

N-Channel Enhancement Mode MOSFET

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
150V	18mΩ@10V	90A

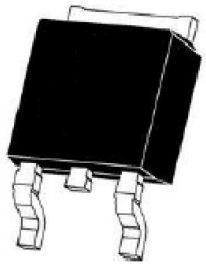
Feature

- Low $R_{DS(ON)}$
- Low gate charge

Application

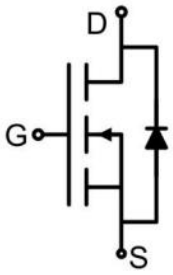
- Automative lighting
- Load switch
- Uninterruptible power supply

Package



TO-252AB

Circuit diagram



Marking

ADR180N15S

N-Channel Enhancement Mode MOSFET

Absolute maximum ratings (T_C=25℃ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	150	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current	I_D	90	A
Continuous Drain Current(T_C =100℃)	I_D(100℃)	56	A
Pulsed Drain Current[1)]	I_{DM}	240	A
Power Dissipation[3)]	P_D	214	W
Thermal Resistance,Junction-to-Case	$R_{\theta JC}$	0.7	℃/W
Single pulse avalanche energyt[2)]	E_{AS}	280	mJ
Junction Temperature	T_J	150	℃
Storage Temperature Range	T_{STG}	-55 ~ +150	℃

Electrical characteristics (T_J=25℃ unless otherwise noted)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-source breakdown voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D =250μA	150			V
Zero gate voltage drain current	I_{DSS}	V_{DS} =150V,V_{GS} = 0V			1	μA
Gate-body leakage current	I_{GSS}	V_{GS} =±20V, V_{DS} = 0V			±100	nA
Gate threshold voltage	$V_{GS(th)}$	V_{DS} =V_{GS}, I_D =250μA	2.0	3.0	4.0	V
Drain-source on-resistance	$R_{DS(on)}$	V_{GS} =10V, I_D =30A		16	18	mΩ
Dynamic characteristics[4)]						
Input Capacitance	C_{iss}	V_{DS} =75V,V_{GS} =0V, f =1MHz		2275		pF
Output Capacitance	C_{oss}			165		
Reverse Transfer Capacitance	C_{rss}			5.5		
Gate Resistance	R_g	f =1MHz, Open drain		4		Ω
Total Gate Charge	Q_g	V_{DS} =75V,V_{GS} =10V, I_D=30A		27		nC
Gate-Source Charge	Q_{gs}			9		
Gate-Drain Charge	Q_{gd}			2		
Turn-on delay time	$t_{d(on)}$	V_{DS}=75V,V_{GS}=10V, I_D =30A,R_G=2Ω		10		nS
Turn-on rise time	t_r			29		
Turn-off delay time	$t_{d(off)}$			16		
Turn-off fall time	t_f			15		
Source-Drain Diode characteristics						
Diode Forward voltage	V_{SD}	V_{GS} =0V,I_S=30A			1.2	V
Diode Forward Current	I_{rrm}	I_S =20A, V_R=75V, di/dt = 100A/μs		210		A
Reverse Recovery Time	t_{rr}			90		nS
Reverse Recovery Charge	Q_{rr}			234		nC

Notes:

1) The data tested by surface mounted on a 1 inch 2 FR-4 board with 2OZ copper.

2) The EAS data shows Max. rating . The test condition is VDD=72V,VGS=10V,L=0.1mH,IAS=40A

3) The power dissipation is limited by 150℃ junction temperature

4) Guaranteed by design, not subject to production.

Typical Characteristics

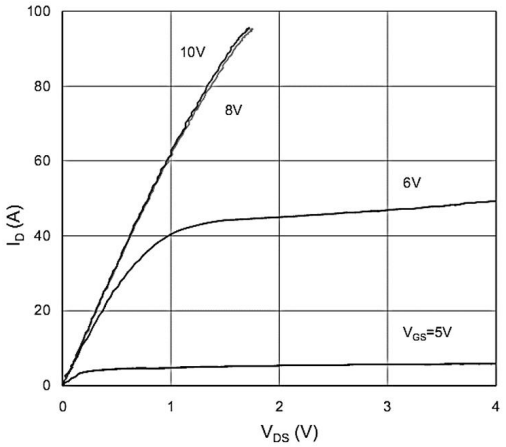


Figure 1. Typical Output Characteristics

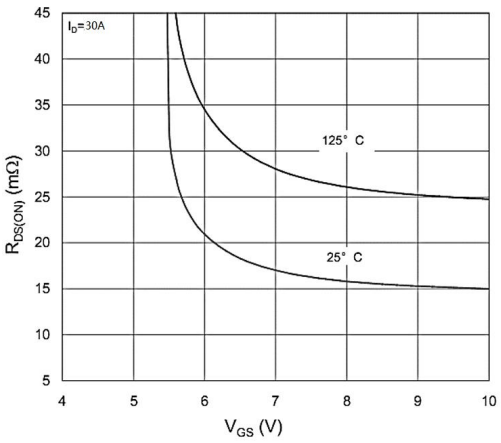


Figure 2. On-Resistance vs. Gate-Source Voltage

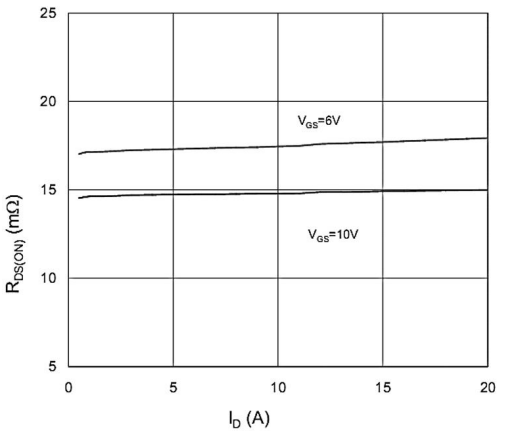


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

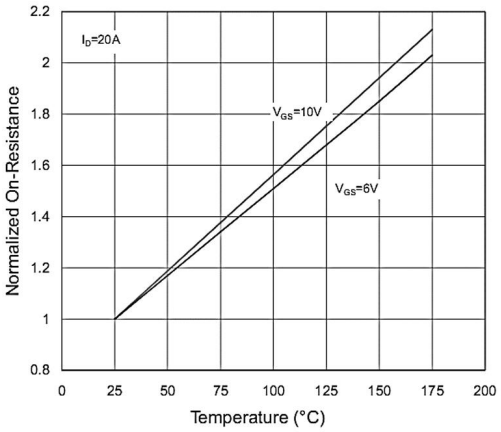


Figure 4. Normalized On-Resistance vs. Junction Temperature

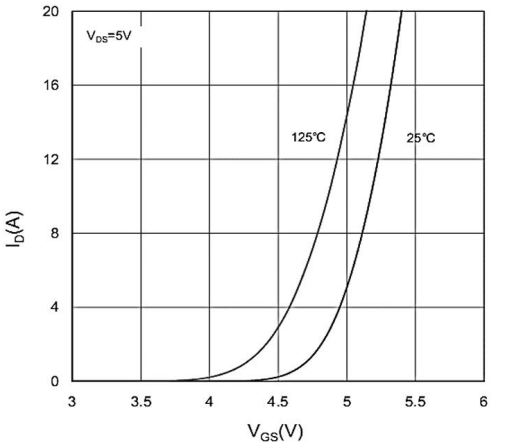


Figure 5. Typical Transfer Characteristics

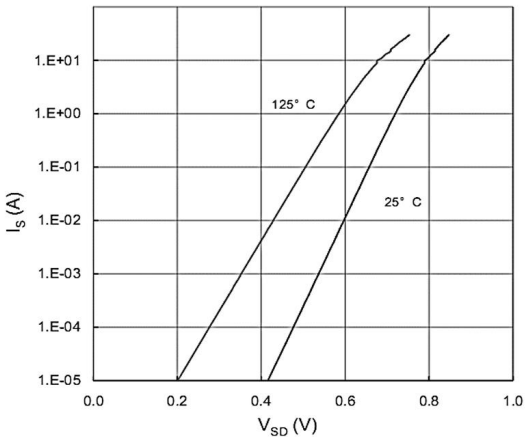


Figure 6. Typical Source-Drain Diode Forward Voltage

Typical Characteristics

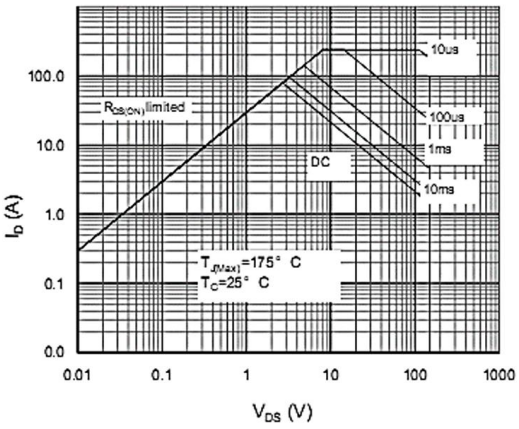


Figure 7. Typical Gate-Charge vs. Gate-to-Source Voltage

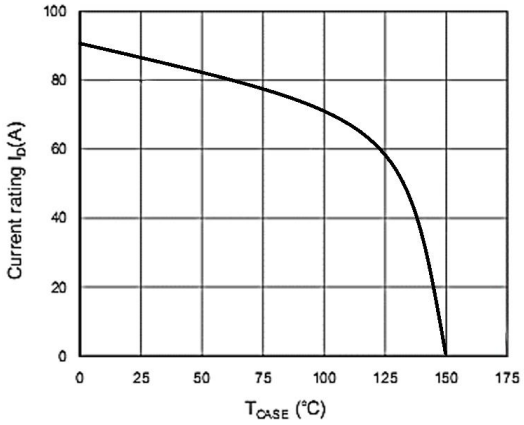


Figure 8. Typical Capacitance vs. Drain-to-Source Voltage

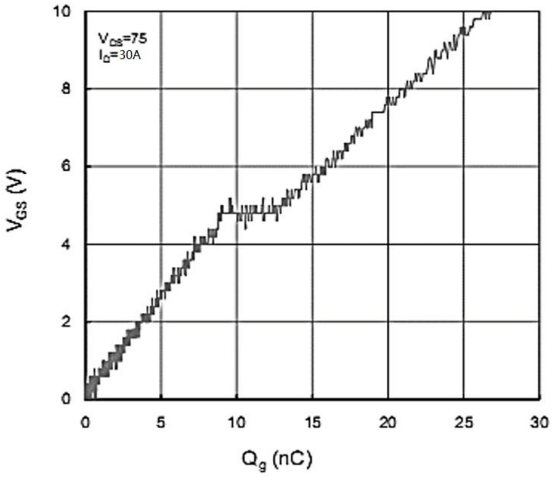


Figure 9. Maximum Safe Operating Area

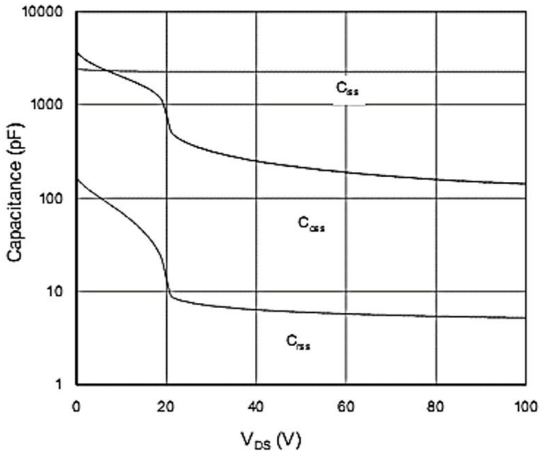


Figure 10. Maximun Drain Current vs. Case Temperature

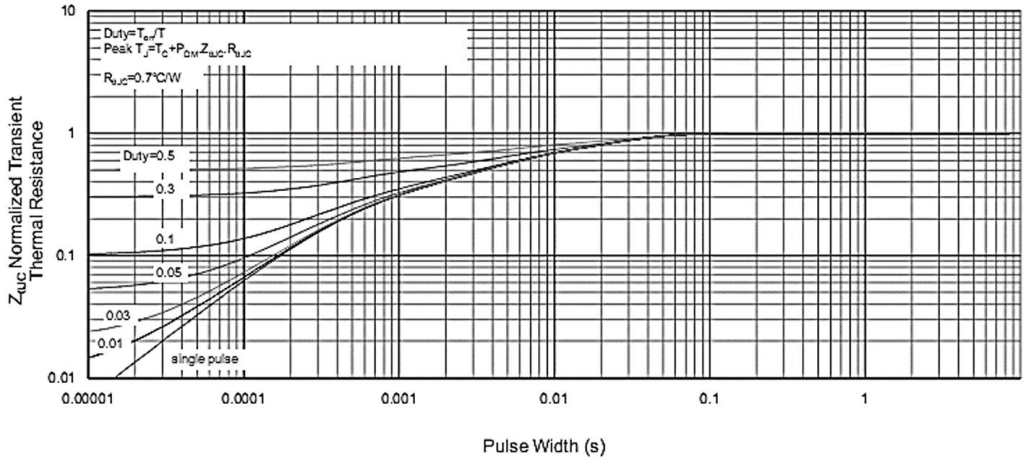
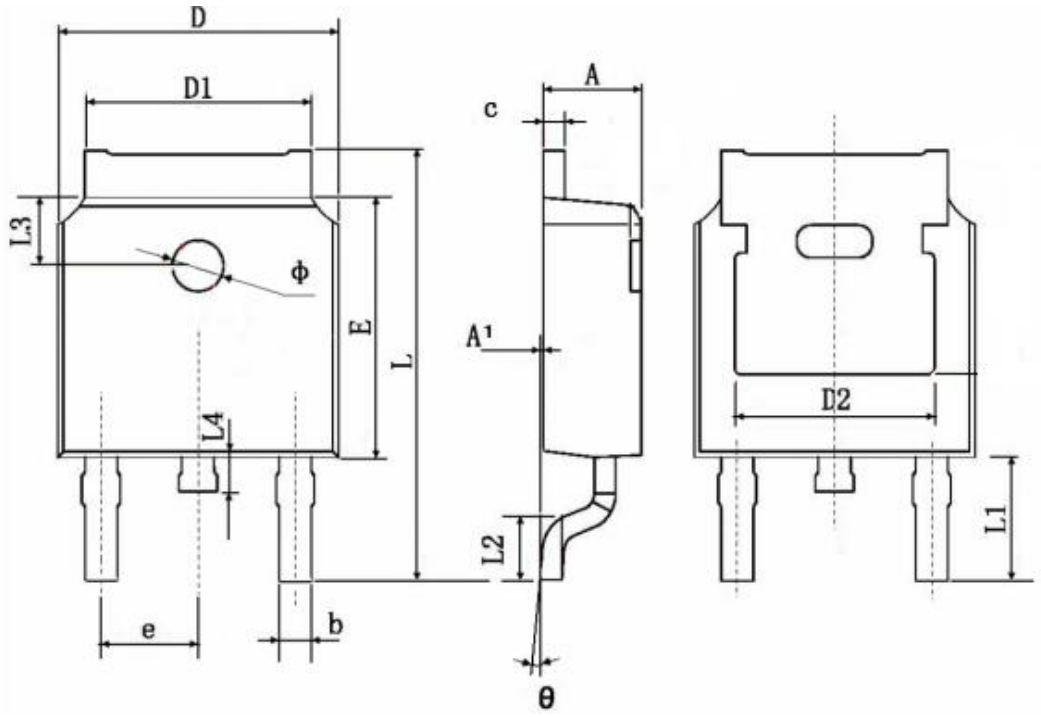


Figure 11. Normalized Maximum Transient Thermal Impedance, Junction-to-Case

TO-252AB Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.100	2.500	0.083	0.098
A1	0.000	0.200	0.000	0.008
b	0.660	0.860	0.026	0.034
c	0.440	0.580	0.017	0.023
D	6.400	6.800	0.252	0.268
D1	5.100	5.500	0.201	0.217
D2	4.630	-	0.182	-
E	5.900	6.300	0.232	0.248
e	2.186	2.390	0.086	0.094
L	9.8500	10.700	0.375	0.421
L1	2.900 REF.		0.114 REF.	
L2	1.250	1.800	0.049	0.070
L3	1.600 REF.		0.063 REF.	
L4	0.600	1.000	0.024	0.039
Φ	1.100	1.300	0.043	0.051
θ	0°	10°	0°	10°