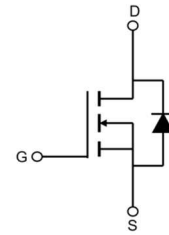


APP30N10K

N-Channel Enhancement Mosfet

Features

- $V_{DS}=100V, I_D=30A$
- $R_{DS(ON)} < 40m\Omega$
@ $V_{GS}=10V, I_D=16A$ TYP: $36.2m\Omega$



Schematic Diagram

Applications

- Power factor correction(PFC)
- Switched mode power supplies(SMPS)
- Uninterruptible power supply(UPS)
- LED



Marking and pin assignment

Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity (PCS)
P30N10K	APP30N10K	TO-252	-	-	2500

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

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	100	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current	I_D	$T_C = 25^\circ C$	30
		$T_C = 100^\circ C$	19
Pulsed Drain Current ⁽¹⁾	I_{DM}	110	A
Single Pulsed Avalanche Energy ⁽²⁾	E_{AS}	506.25	mJ
Power Dissipation	P_D	130	W
Thermal Resistance from Junction to Case ⁽¹⁾	$R_{\theta JC}$	0.98	$^\circ C/W$
Thermal Resistance- Junction to Ambient	$R_{\theta JA}$	62.5	$^\circ C/W$
Junction Temperature	T_J	150	$^\circ C$
Storage Temperature	T_{STG}	-55~ +150	$^\circ C$

MOSFET ELECTRICAL CHARACTERISTICS(T_J=25°C unless otherwise noted)

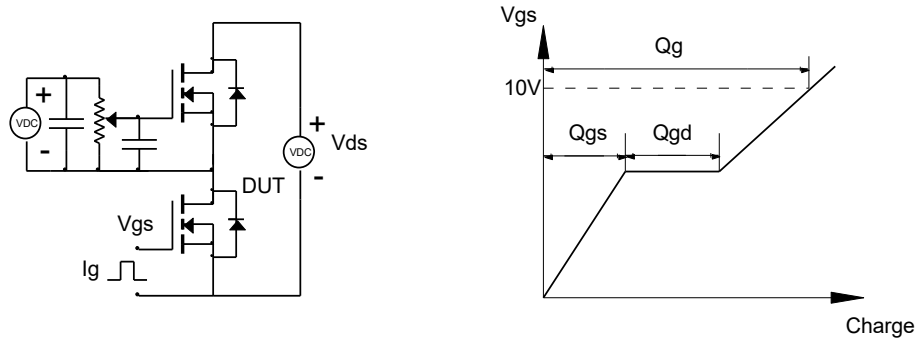
Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Static Characteristics						
Drain-source breakdown voltage	V _{(BR)DSS}	V _{GS} = 0V, I _D =250μA	100	-	-	V
Zero gate voltage drain current	I _{DSS}	V _{DS} =100V, V _{GS} = 0V	-	-	100	nA
Gate-body leakage current	I _{GSS}	V _{GS} = ±20V, V _{DS} = 0V	-	-	±100	nA
Gate threshold voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	2.0	2.8	4.0	V
Drain-source on-resistance	R _{DS(on)}	V _{GS} =10V, I _D =16A	-	36.2	40	mΩ
Dynamic characteristics						
Gate Resistance	R _g	V _{GS} =0V, f =1.0MHz	1	1.81	10	Ω
Input Capacitance	C _{iss}	V _{DS} =25V, V _{GS} =0V, f =1.0MHz	-	1700	-	pF
Output Capacitance	C _{oss}		-	210	-	
Reverse Transfer Capacitance	C _{rss}		-	25	-	
Switching characteristics						
Turn-on delay time	t _{d(on)}	V _{DD} =50V, I _D =16A, V _{GS} =10V ,R _G =5.1Ω	-	9.8	-	ns
Turn-on rise time ^(3,4)	t _r		-	39.6	-	
Turn-off delay time	t _{d(off)}		-	46.1	-	
Turn-off fall time	t _f		-	10.1	-	
Total Gate Charge ^(3,4)	Q _g	V _{DS} =80V, I _D =16A, V _{GS} =10V	-	33.1	-	nC
Gate-Source Charge ^(3,4)	Q _{gs}		-	6.1	-	
Gate-Drain Charge ^(3,4)	Q _{gd}		-	11.7	-	
Source-Drain Diode characteristics						
Diode Forward voltage ⁽²⁾	V _{SD}	T _J =25°C, V _{GS} =0V, I _S =50A	-	0.85	1.3	V
Diode Forward current	I _S	T _C =25°C	-	-	30	A
Body Diode Reverse Recovery Time	t _{rr}	T _J =25°C, I _F =50A, di/dt=100A/us		102		ns
Body Diode Reverse Recovery Charge	Q _{rr}	T _J =25°C, I _F =50A, di/dt=100A/us		1.1		uc

Notes:

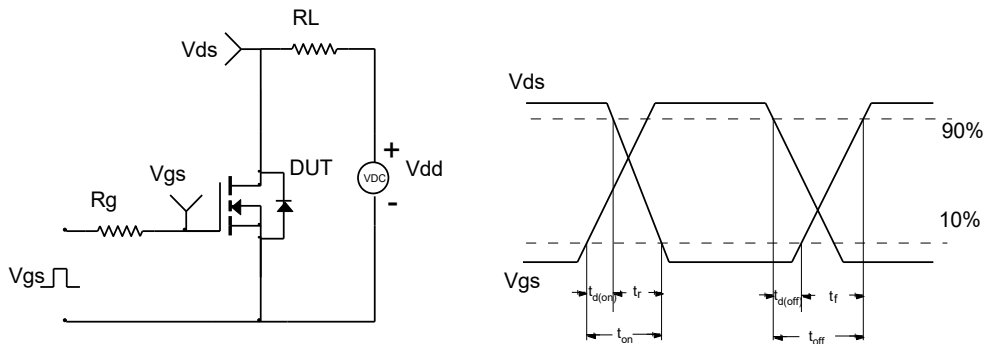
1. Pulse width limited by maximum junction temperature
2. L=10mH, I_{AS}=9A, V_{DD}=80A, V_G=10V, R_G=25 Ω starting T_J=25°C
3. Pulse width ≤ 300 μs, duty cycle ≤ 2 %
4. Essentially independent of operating temperature

Test Circuit

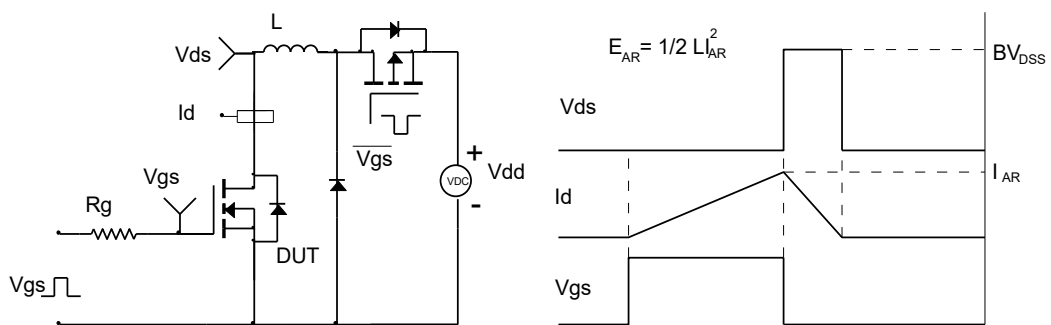
Gate Charge Test Circuit & Waveform



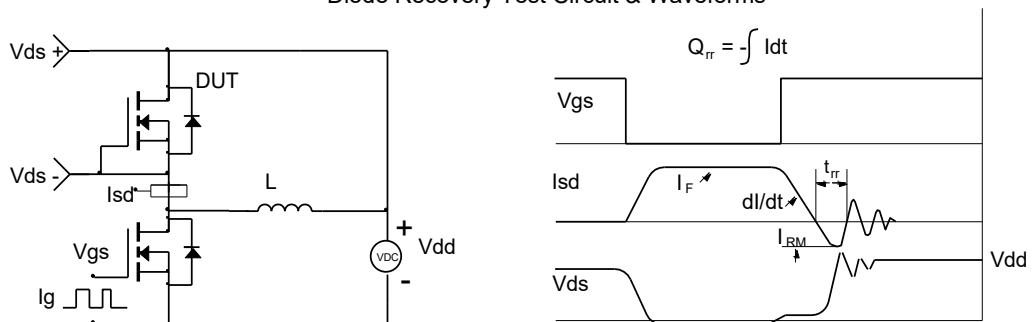
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



Typical Performance Characteristics

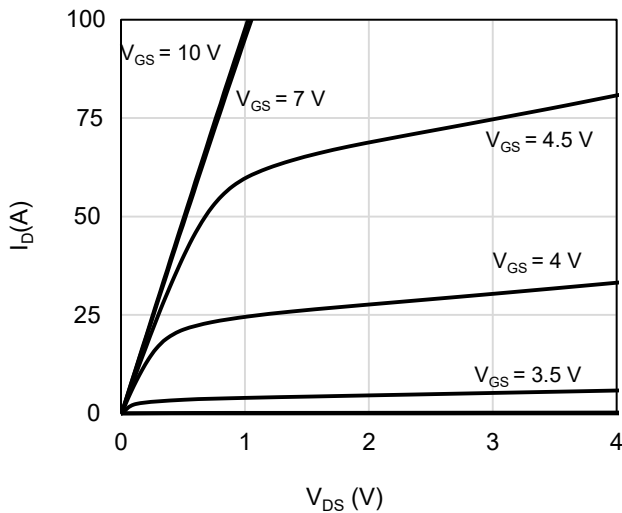


Figure 1: On-Region Characteristics

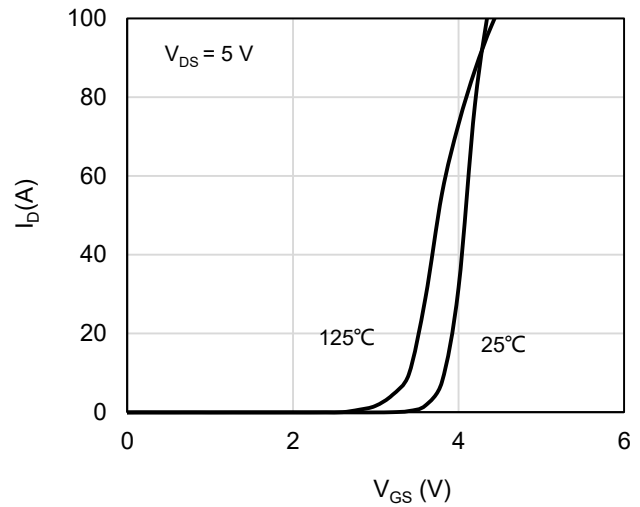


Figure 2: Transfer Characteristics

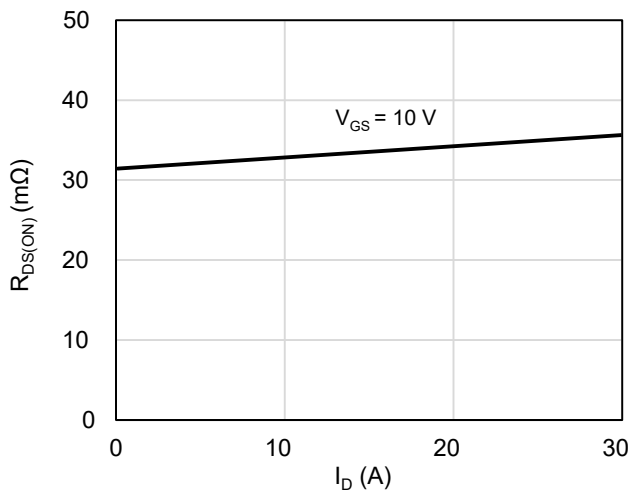


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

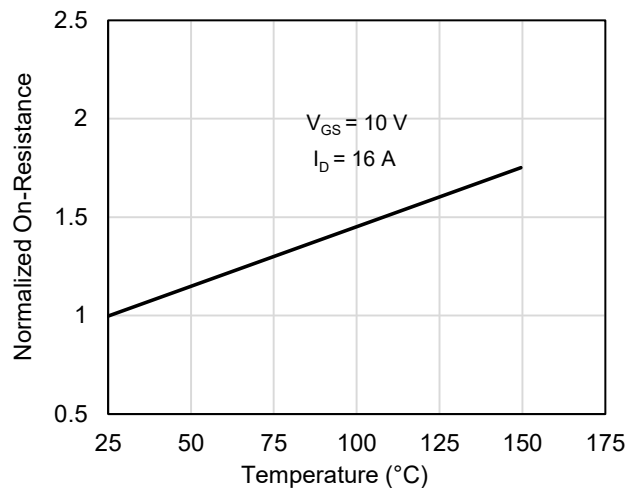


Figure 4: On-Resistance vs. Junction Temperature

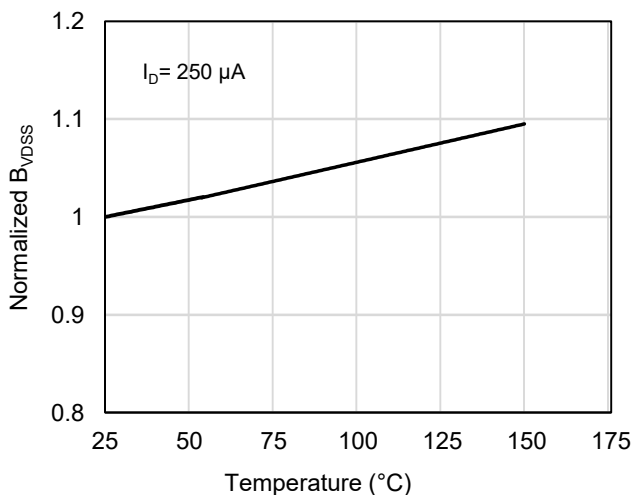


Figure 5: Breakdown Voltage vs. Junction Temperature

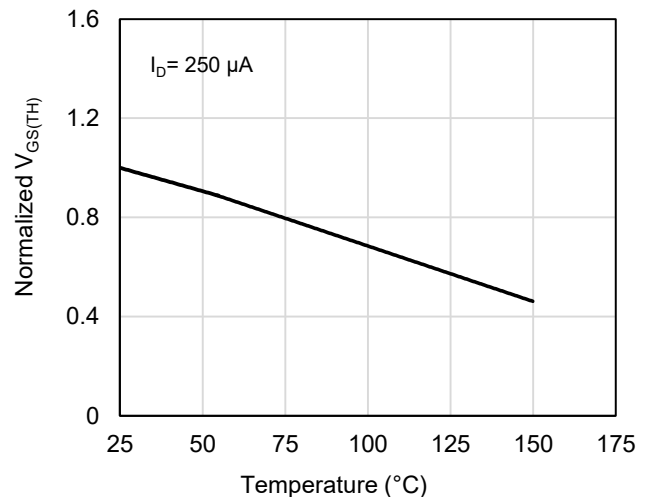


Figure 6: Threshold Voltage vs. Junction Temperature

Typical Performance Characteristics

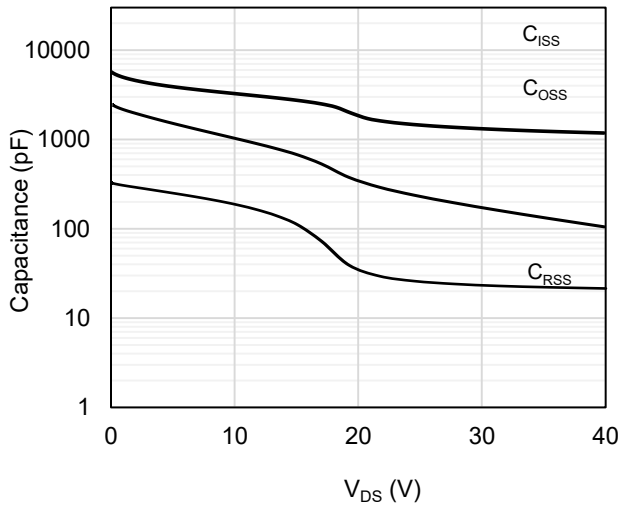


Figure 7: Capacitance Characteristics

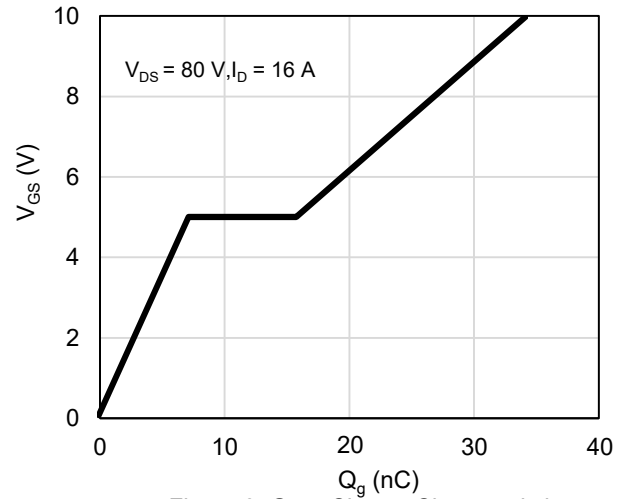


Figure 8: Gate-Charge Characteristics

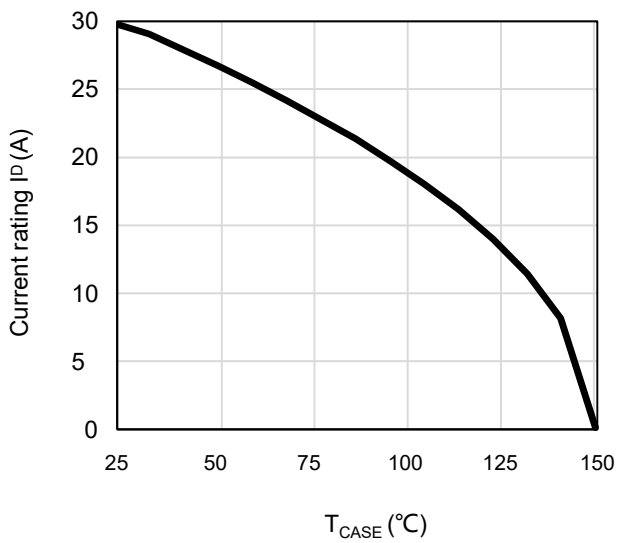
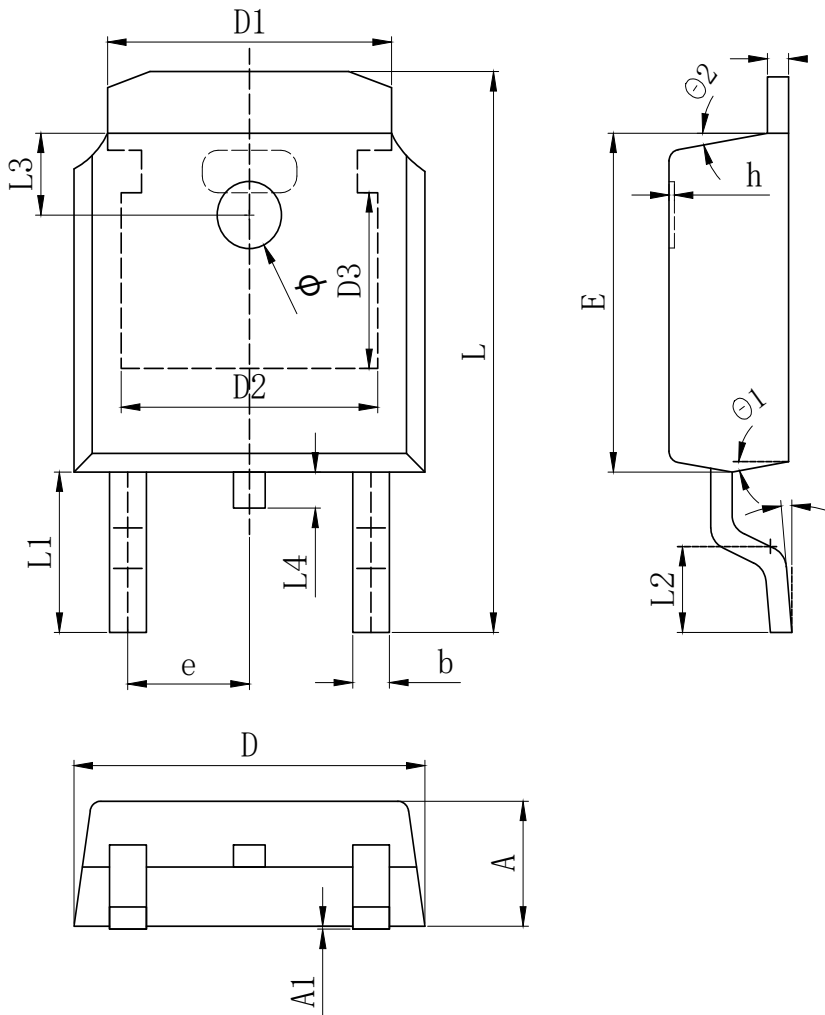


Figure 9: Current De-rating

APP30N10K
N-Channel Enhancement Mosfet

TO-252 Package Information



SYMBOL	MILLIMETER		
	MIN	Typ.	MAX
A	2.200	2.300	2.400
A1	0.000		0.127
b	0.640	0.690	0.740
c (电镀后)	0.460	0.520	0.580
D	6.500	6.600	6.700
D1	5.334 REF		
D2	4.826 REF		
D3	3.166 REF		
E	6.000	6.100	6.200
e	2.286 TYP		
h	0.000	0.100	0.200
L	9.900	10.100	10.300
L1	2.888 REF		
L2	1.400	1.550	1.700
L3	1.600 REF		
L4	0.600	0.800	1.000
ϕ	1.100	1.200	1.300
θ	0°		8°
$\theta 1$	9° TYP		
$\theta 2$	9° TYP		

Revision History

Revision	Release	Remark
V1.0	2024/04/23	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.