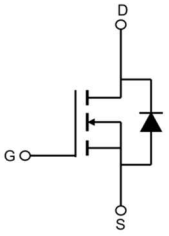
AP60N10K

N-Channel Enhancement Mosfet

DATA SHEET

Features

- 100V,60A
  $R_{DS(ON)}$ <12.0mΩ @V_{GS}=10V TYP:10.0mΩ
- 100% Avalanche Tested
- Reliable and Rugged
- Halogen Free and Green Devices Available (RoHS Compliant)



Schematic Diagram

Applications

- Portable equipment and battery powered systems
- DC-DC Converters
- Switching application



Marking and pin assignment

Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity (PCS)
60N10K	AP60N10K	TO-252	-	-	2500

ABSOLUTE MAXIMUM RATINGS (T_J=25℃ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	100	V
Gate-Source Voltage	V_{GS}	±25	V
Continuous Drain Current (Tc=25℃)	I_D	60	A
Continuous Drain Current (Tc=100℃)	I_D	45	A
Pulsed Drain Current [1]	I_{DM}	240	A
Single Pulsed Avalanche Energy (Tc=25℃,L=0.5mH) [3]	E_{AS}	355	mJ
Drain Power Dissipation[1]	P_D	65	W
Thermal Resistance from Junction to Case[2]	$R_{\theta JC}$	2.3	℃/W
Thermal Resistance- Junction to Ambient[2]	$R_{\theta JA}$	62.5	℃/W
Junction Temperature	T_J	175	℃
Storage Temperature	T_{STG}	-55~ +175	℃

MOSFET ELECTRICAL CHARACTERISTICS(T_J=25℃ unless otherwise noted)

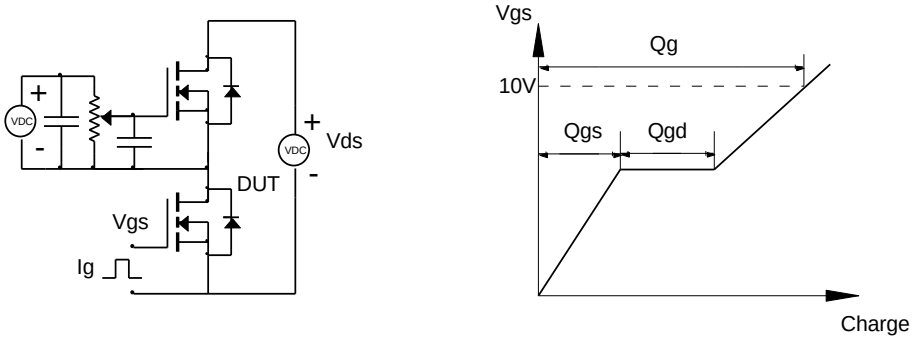
Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Static Characteristics						
Drain-source breakdown voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D =250μA	100	-	-	V
Zero gate voltage drain current	I_{DSS}	V_{DS} =80V, V_{GS} = 0V	-	-	1	μA
Gate-body leakage current	I_{GSS}	V_{GS} =±25V, V_{DS} = 0V	-	-	±100	nA
Gate threshold voltage	$V_{GS(th)}$	V_{DS} =V_{GS}, I_D =250μA	2	3	4	V
Drain-source on-resistance[a]	$R_{DS(on)}$	V_{GS} =10V, I_D =30A		10.0	12.0	mΩ
Dynamic characteristics[b]						
Input Capacitance	C_{iss}	V_{DS} =25V, V_{GS} =0V, f =1.0MHz	-	3197	-	pF
Output Capacitance	C_{oss}		-	361	-	
Reverse Transfer Capacitance	C_{rss}		-	230	-	
Switching characteristics[b]						
Turn-on delay time	$t_{d(on)}$	V_{DD}=50V, I_D=350A, R_G=3.3Ω, V_G=10V, R_L=1Ω	-	19	-	nS
Turn-on rise time	t_r		-	50	-	
Turn-off delay time	$t_{d(off)}$		-	62	-	
Turn-off fall time	t_f		-	68	-	
Total Gate Charge	Qg	V_{DS}=80V, I_D=30A, V_{GS}=10V	-	81	-	nC
Gate-Source Charge	Qgs		-	13	-	
Gate-Drain Charge	Qgd		-	26	-	
Source-Drain Diode characteristics						
Diode Forward voltage[a]	V_{SD}	T_J=25℃, V_{GS} =0V, I_S=30A	-	-	1.2	V
Diode Forward current	I_S	T_C=25℃	-	-	60	A
Body Diode Reverse Recovery Time	trr	T_J=25℃，IF=30A,di/dt=100A/us		30		nS
Body Diode Reverse Recovery Charge	Qrr	T_J=25℃，IF=30A,di/dt=100A/us		50		nC

Notes:

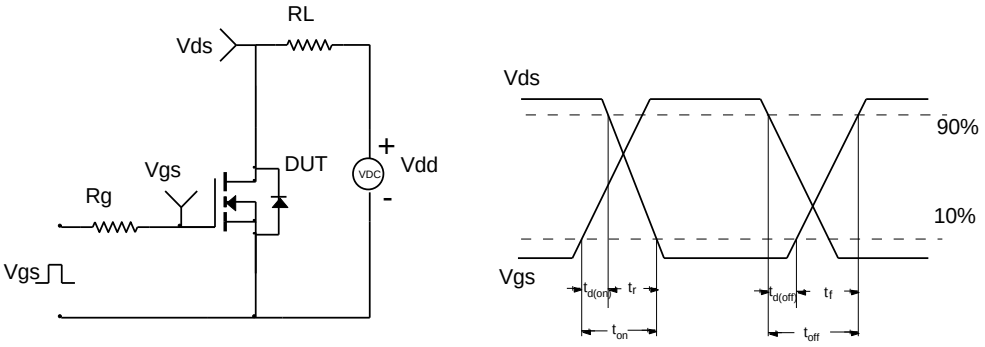
1. Repetitive rating；pulse width limited by max.junction temperature.
2. Surface mounted on 1in2 FR-4 board.
3. Limited by TJmax , starting TJ=25°C, L = 0.5mH, VDS=80V, VGS =10V.
4. Pulse test，pulse width ≤ 300us，duty cycle ≤ 2%

Test Circuit

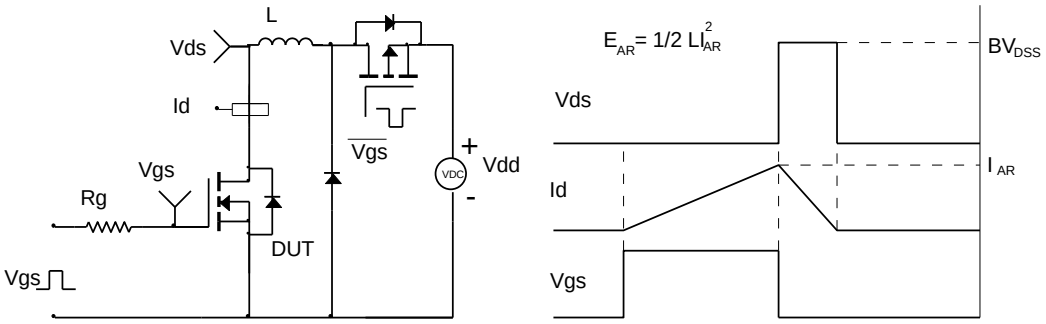
Gate Charge Test Circuit & Waveform



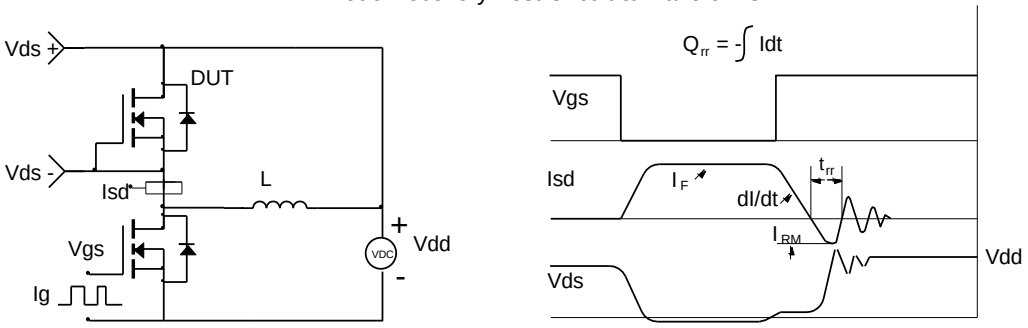
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



Typical Characteristics

Figure 1: Power Dissipation

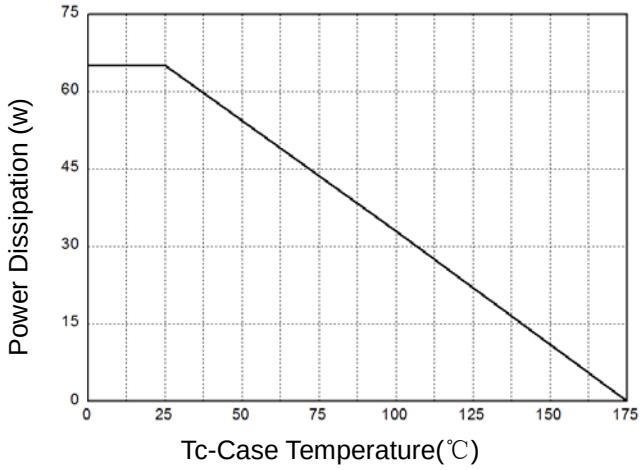


Figure 2: Drain Current

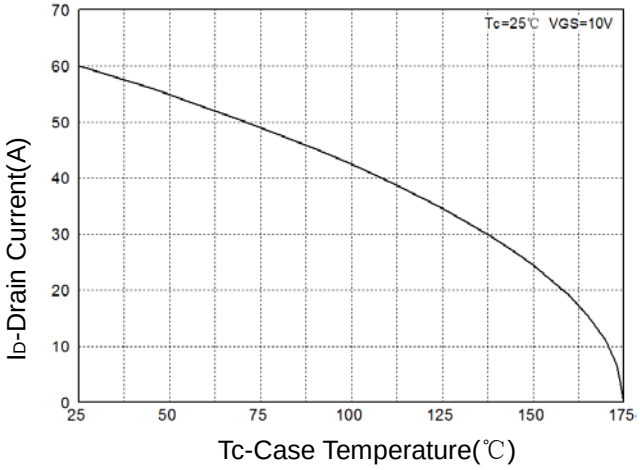


Figure 3: Safe Operation Area

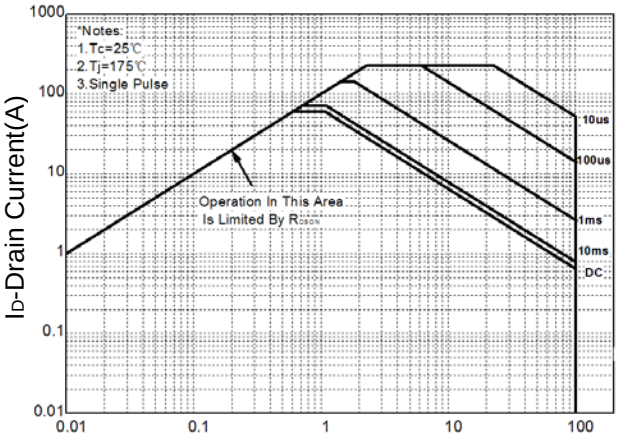
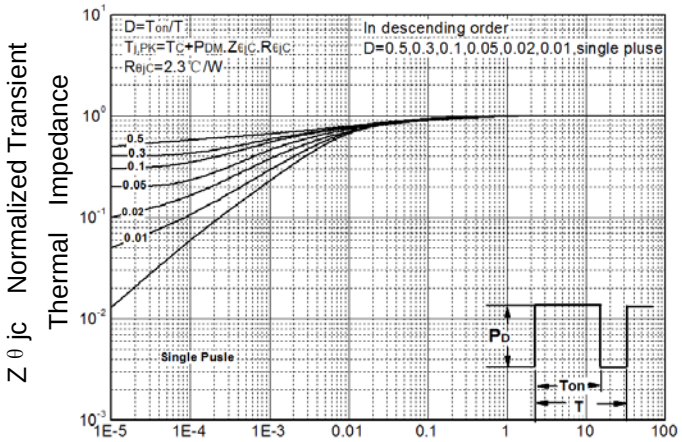


Figure 4: Thermal Transient Impedance



Maximum Effective Transient Thermal Impedance, Junction-to-Case

Figure 5: Output Characteristics

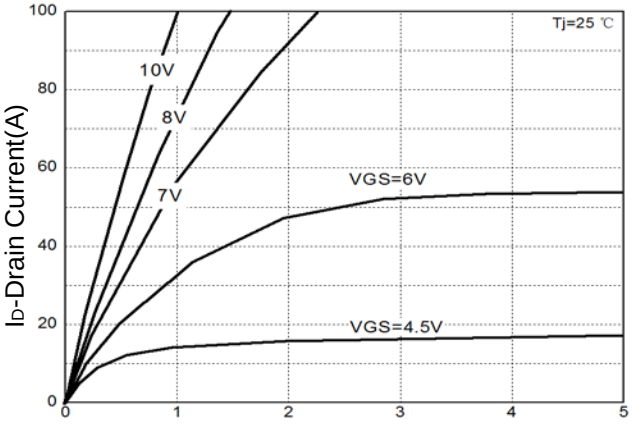
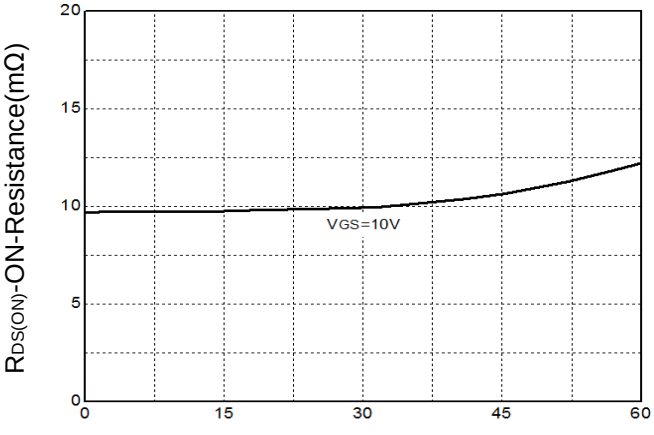


Figure 6: Drain-Source On Resistance



Typical Characteristics

Figure 7: On-Resistance vs. Temperature

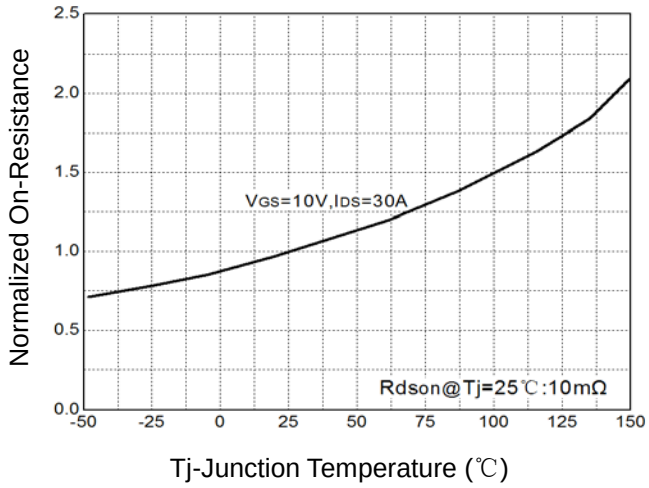


Figure 8: Source-Drain Diode Forward

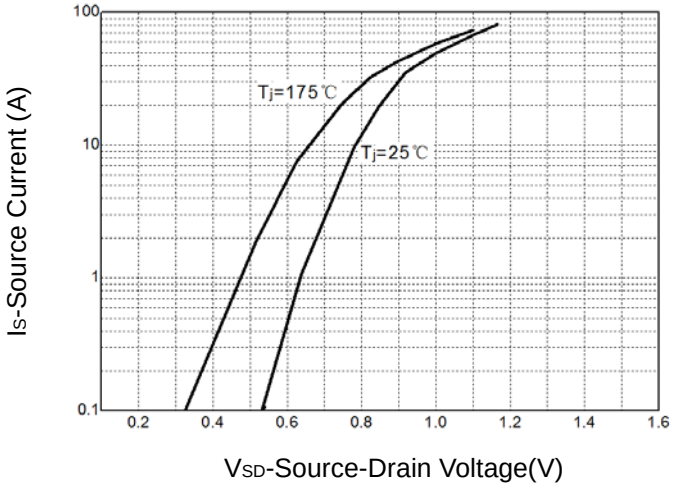


Figure 9: Capacitance Characteristics

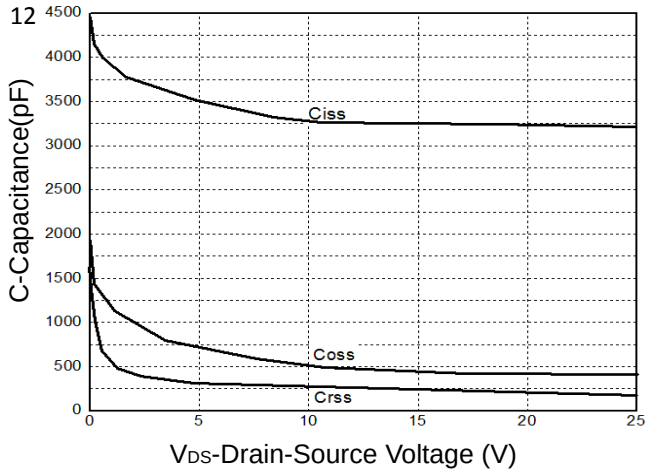
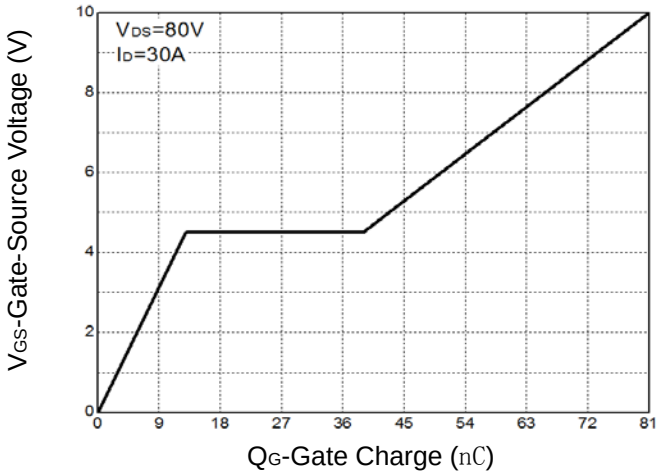
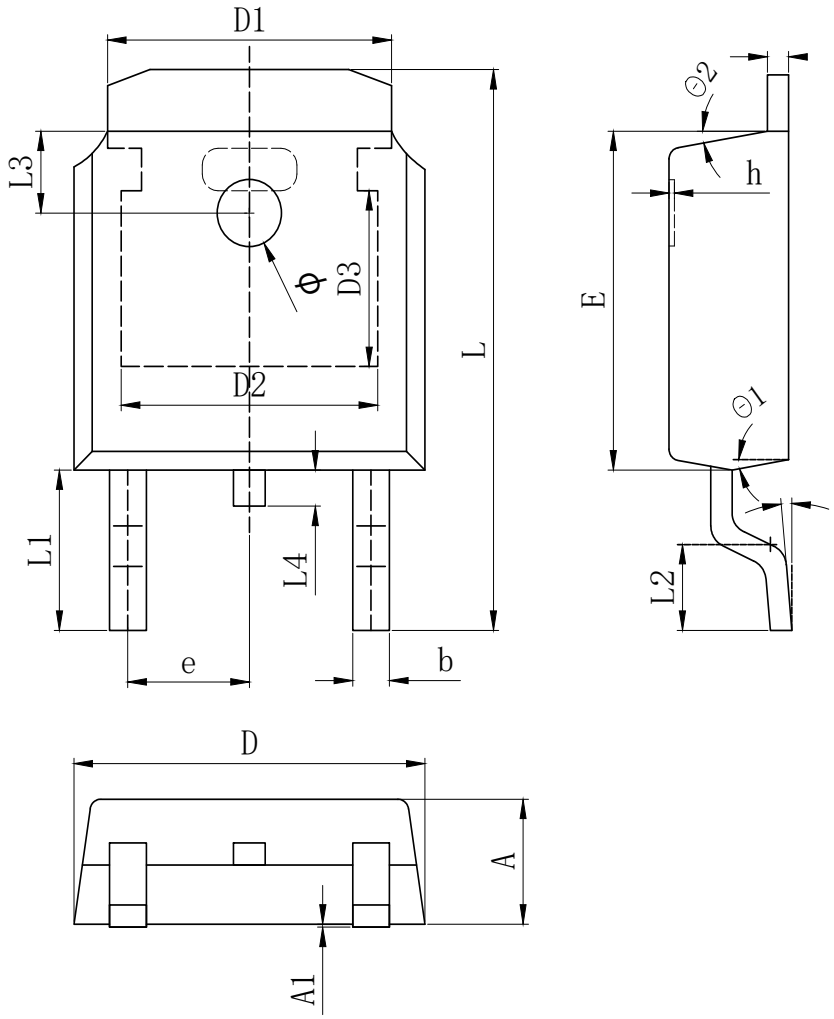


Figure 10: Gate Charge Characteristics



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°
θ1	9° TYP		
θ2	9° TYP		

Revision History

Revision	Release	Remark
V1.0	2023/10/07	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.