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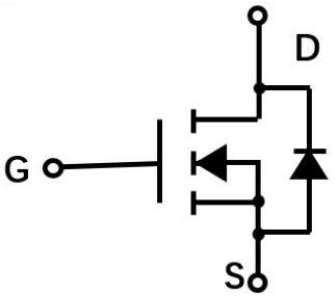
APG180N10K Data Sheet

V 1.0

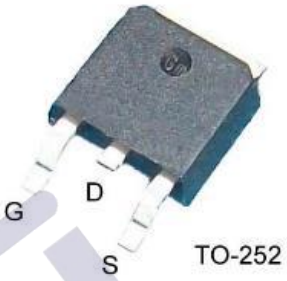
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Features

- 100V, 50A
- RDS(ON) = 15mΩ (Typ.) @ VGS = 10V, ID = 20A
- Low RDS(on) & FOM
- Extremely low switching loss
- Excellent stability and uniformity
- 100% UIS tested , 100% △VDS Tested
- RoHS and Halogen-Free Compliant



Schematic Diagram



Packages

Application

- High Frequency Switching
- Synchronous Rectification

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

Parameter		Symbol	Max.	Units
Drain-Source Voltage		V_{DSS}	100	V
Gate-Source Voltage		V_{GSS}	± 20	V
Continuous Drain Current note5	TC = 25℃	I_D	50	A
Continuous Drain Current note5	TC = 100℃	I_D	31.5	A
Pulsed Drain Current note3		I_{DM}	200	A
Power Dissipation note2	TC = 25℃	P_D	68	W
Avalanche Current note3,6		I_{AS}	21	A
Single Pulse Avalanche Energy note3,6		E_{AS}	103	mJ
Thermal Resistance, Junction to Case		$R_{\theta JC}$	1.85	℃/W
Thermal Resistance, Junction to Ambient note1,4		$R_{\theta JA}$	55	℃/W
Operating and Storage Temperature Range		T_J, T_{STG}	-55 to +150	℃

*Drain current limited by maximum junction temperature

Electrical Characteristics(T_C=25℃ unless otherwise specified)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Units
Off Characteristic						
Drain-Source Breakdown Voltage	BV_{DSS}	VGS = 0V, ID = 250μA	100	-	-	V
Drain-Source Leakage Current	I_{DSS}	VDS = 80V, VGS = 0V	-	-	1	μA
Gate to Body Leakage Current	I_{GSS}	VDS = 0V, VGS = ±20V	-	-	±100	nA
On Characteristics						
Gate Threshold Voltage	$V_{GS(th)}$	VDS = VGS, ID = 250μA	1.2	1.8	2.5	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	VGS = 10V, ID = 20A	-	15	18	mΩ
		VGS = 4.5V, ID = 10A	-	19.5	25	mΩ
Gate Resistance	R_g	VDS = VGS=0V,f=1.0MHz	-	1.44	-	Ω
Dynamic Characteristics						
Input Capacitance	C_{iss}	VDS = 50V, VGS = 0V, f = 1.0MHz	-	1050	-	pF
Output Capacitance	C_{oss}		-	196	-	pF
Reverse Transfer Capacitance	C_{rss}		-	3.5	-	pF
Switching Characteristics						
Total Gate Charge	Q_g	VDS= 50V, ID = 40A, VGS = 10V	-	13.9	-	nC
Gate-Source Charge	Q_{gs}		-	4	-	
Gate-Drain(“Miller”) Charge	Q_{gd}		-	2.4	-	
Turn-On Delay Time	$t_{d(on)}$	VDS = 50V, ID = 40A, RG = 3.3Ω, VGS=10V	-	27	-	ns
Turn-On Rise Time	t_r		-	49	-	
Turn-Off Delay Time	$t_{d(off)}$		-	225	-	
Turn-Off Fall Time	t_f		-	94	-	
Diode Characteristics						
Continuous Source Current	I_S		-	-	50	A
Diode Forward Voltage	V_{SD}	IS=20A . VGS = 0V	-	0.88	1.0	V
Reverse Recovery Time	t_{rr}	ISD=20A, dISD/dt=100A/μs	-	35	-	ns
Reverse Recovery Charge	Q_{rr}		-	34	-	nC

Notes:

1. The value of $R_{\theta JC}$ is measured in a still air environment with TA =25°C and the maximum allowed junction temperature of 150°C. The value in any given application depends on the user's specific board design.
2. The power dissipation P_D is based on $T_{J(MAX)}$=150°C, using junction-to-case thermal resistance, and is more useful insetting the upper dissipation limit for cases where additional heatsinking is used.
3. Single pulse width limited by junction temperature $T_{J(MAX)}$=150°C.
4. The $R_{\theta JA}$ is the sum of the thermal impedance from junction to case $R_{\theta JC}$ and case to ambient.
5. The maximum current rating is package limited.
6. The EAS data shows Max. rating. The test condition is V_{DS}=50V,V_{GS}=10V,L=0.5mH

Typical Performance Characteristics

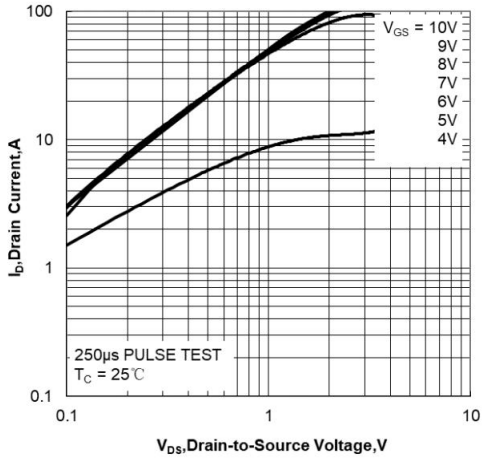


Figure 1. Output Characteristics

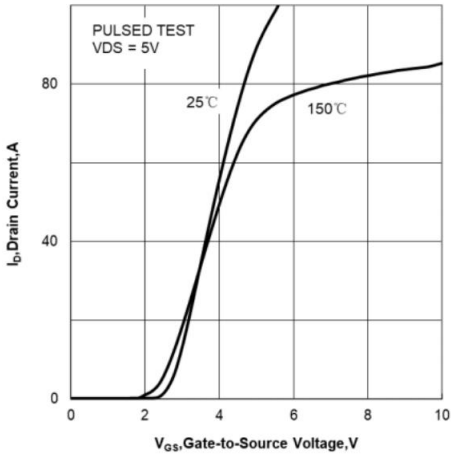


Figure 2. Transfer Characteristics

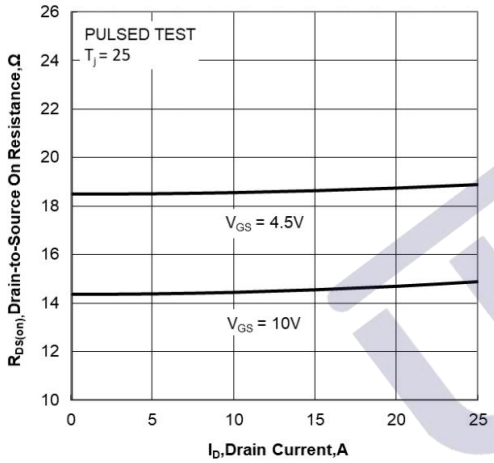


Figure 3. Drain-to-Source On Resistance vs Drain Current

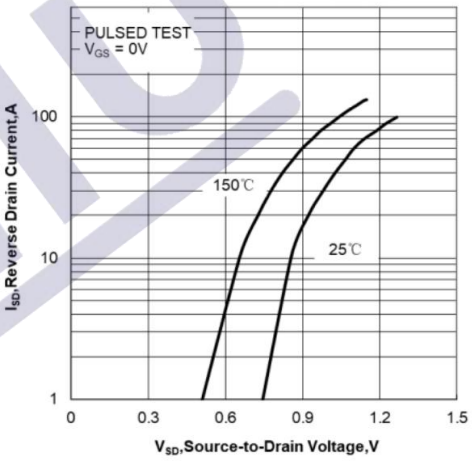


Figure 4. Body Diode Forward Voltage vs Source Current and Temperature

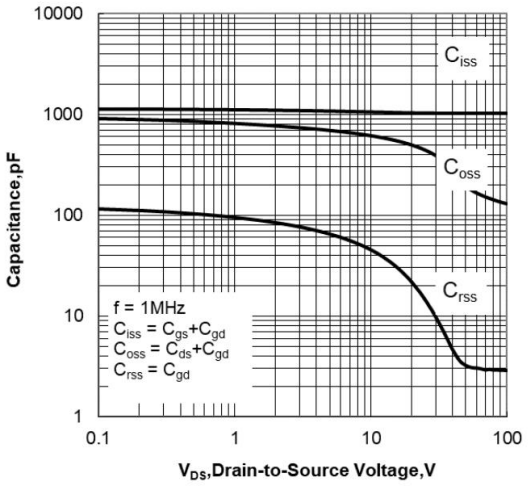


Figure 5. Capacitance Characteristics

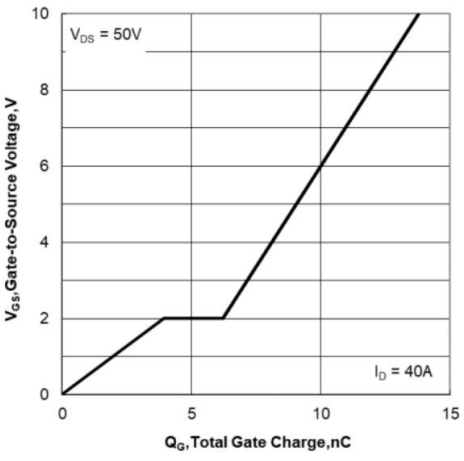


Figure 6. Gate Charge Characteristics

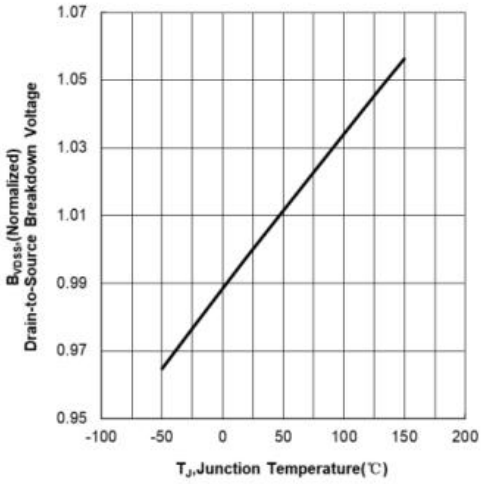


Figure 7. Normalized Breakdown Voltage vs Junction Temperature

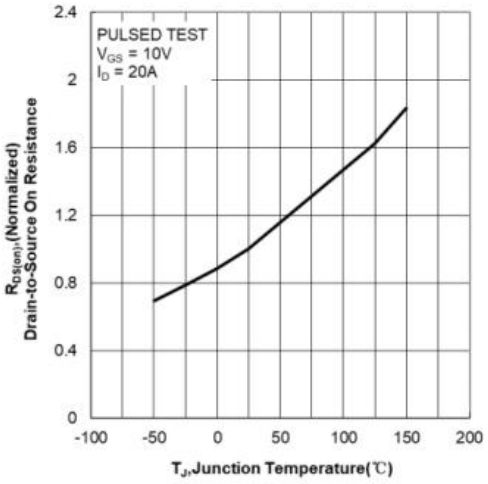


Figure 8. Normalized On Resistance vs Junction Temperature

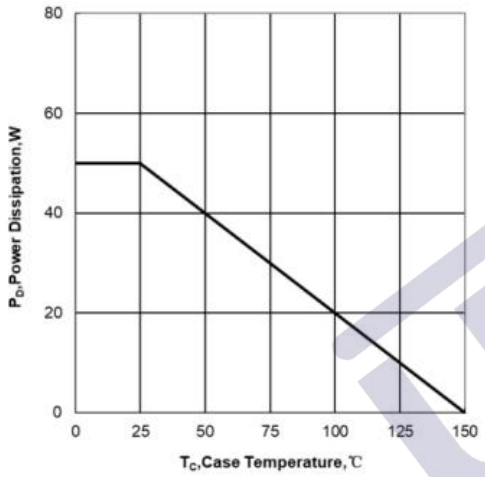


Figure 9. Maximum Continuous Drain Current vs Case Temperature

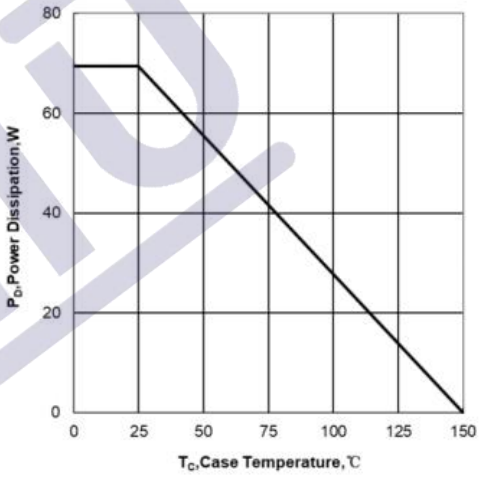


Figure 10. Maximum Power Dissipation vs Case Temperature

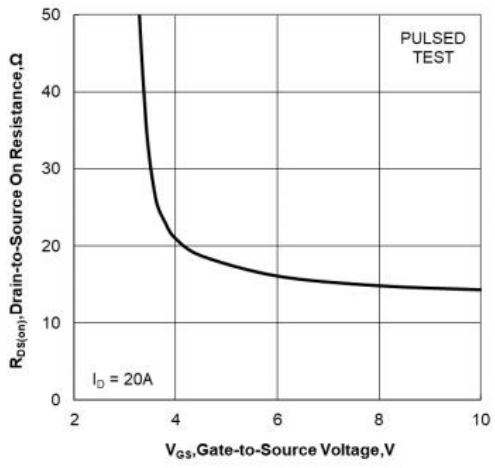


Figure11. Drain-to-Source On Resistance vs Gate Voltage and Drain Current

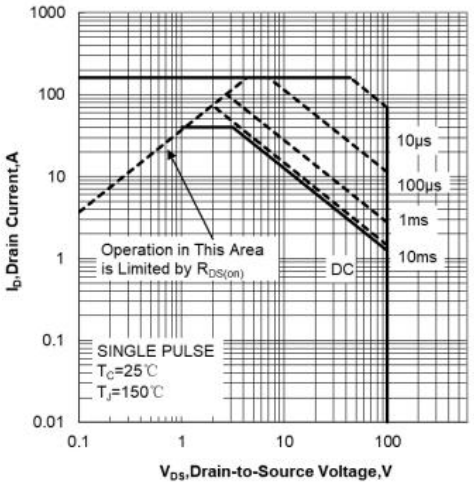


Figure 12. Maximum Safe Operating Area

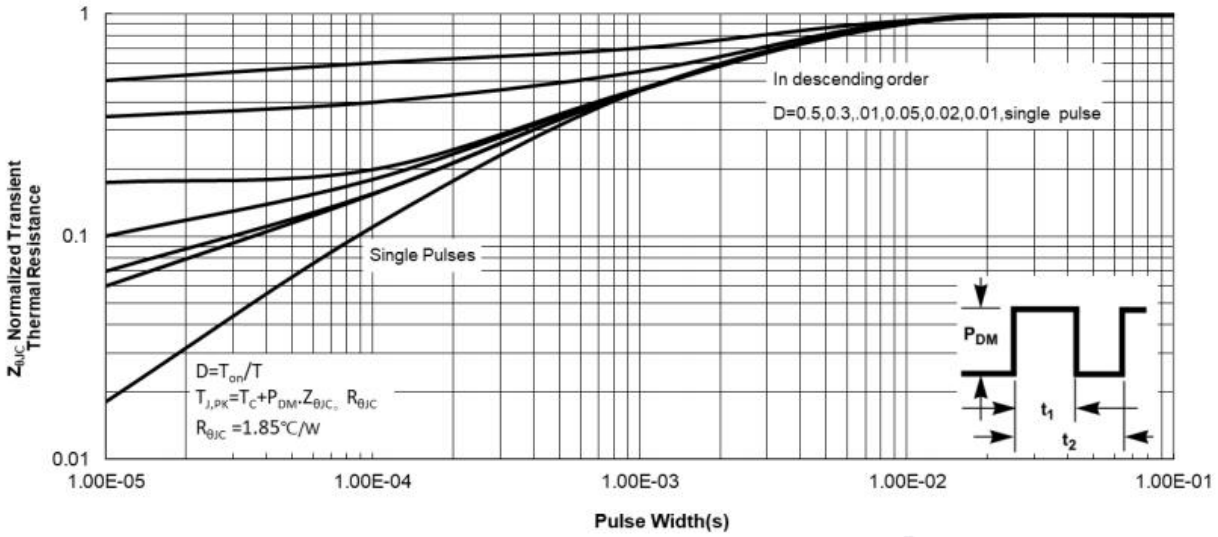
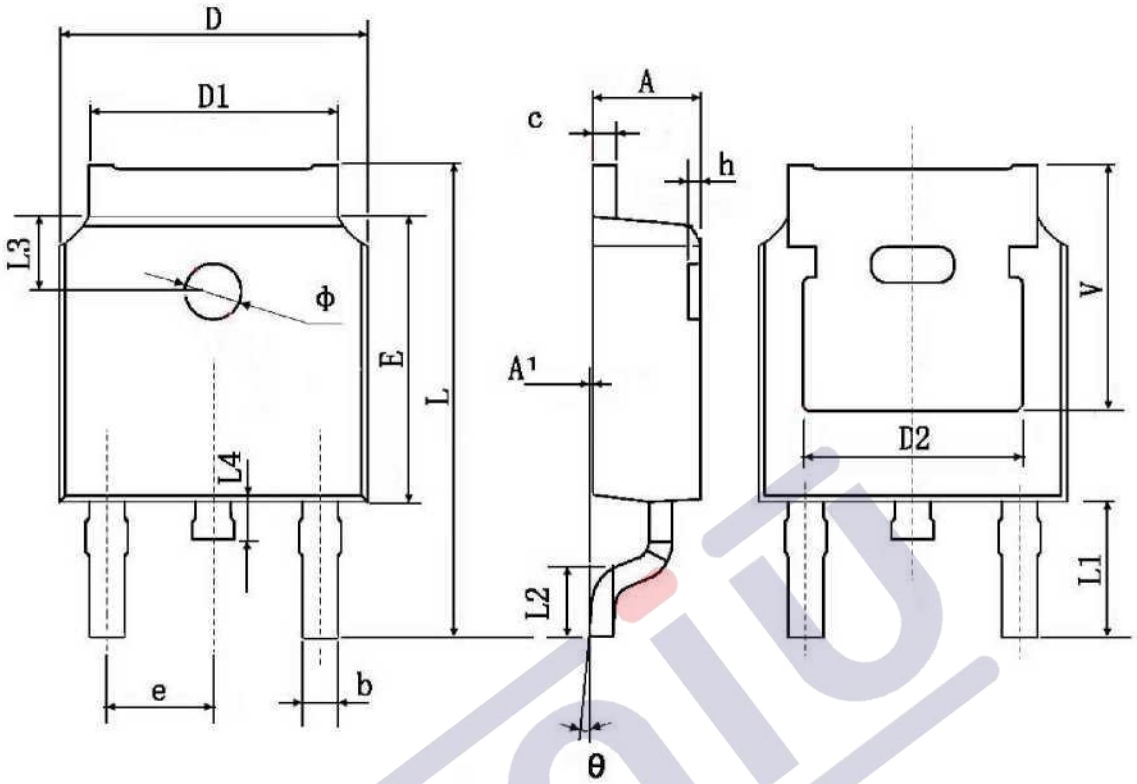


Figure 13. Maximum Effective Transient Thermal Impedance, Junction-to-Case

Package Information

TO-252



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.200	2.400	0.087	0.094
A1	0.000	0.127	0.000	0.005
b	0.660	0.860	0.026	0.034
c	0.460	0.580	0.018	0.023
D	6.500	6.700	0.256	0.264
D1	5.100	5.460	0.201	0.215
D2	4.830 TYP.		0.190 TYP.	
E	6.000	6.200	0.236	0.244
e	2.186	2.386	0.086	0.094
L	9.800	10.400	0.386	0.409
L1	2.900 TYP.		0.114 TYP.	
L2	1.400	1.700	0.055	0.067
L3	1.600 TYP.		0.063 TYP.	
L4	0.600	1.000	0.024	0.039
Φ	1.100	1.300	0.043	0.051
θ	0°	8°	0°	8°
h	0.000	0.300	0.000	0.012
V	5.350 TYP.		0.211 TYP.	

1、版本记录

DATE	REV.	DESCRIPTION
2023/2/25	1.0	首次发布

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