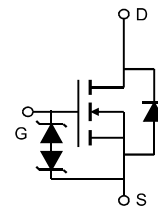


AP1606

N-Channel Power MOSFET

Description

The 1606 designed by the trench processing techniques to achieve extremely low on-resistance. And fast switching speed and improved transfer effective .



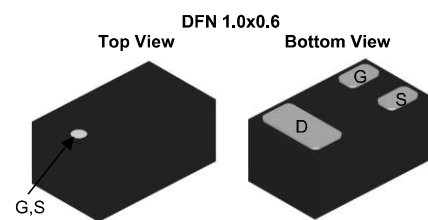
Schematic diagram

Features

- ◆ Ron(typ.)=210 mΩ @VGS=2.5V
- ◆ Ron(typ.)=180mΩ @VGS=4.5V
- ◆ Low On-Resistance
- ◆ 150°C Operating Temperature
- ◆ Fast Switching
- ◆ Lead-Free, RoHS Compliant

Application

- Load switch



Symbol	Parameter		Rating	Unit
Common Ratings (T_c=25°C Unless Otherwise Noted)				
V _{GS}	Gate-Source Voltage		±8	V
V _{(BR)DSS}	Drain-Source Breakdown Voltage		20	V
T _J	Maximum Junction Temperature		150	°C
T _{STG}	Storage Temperature Range		-50 to 155	°C
I _S	Diode Continuous Forward Current	T _c =25°C	0.7 ^①	A
Mounted on Large Heat Sink				
I _{DM}	Pulse Drain Current Tested	T _c =25°C	3	A
I _D	Continuous Drain Current(VGS=10V)	T _c =25°C	0.7 ^①	A
		T _c =100°C	0.5	
P _D	Maximum Power Dissipation	T _c =25°C	0.55	W
R _{θJA}	Thermal Resistance Junction-Ambient		100	°C/W

AP1606
N-Channel Power MOSFET

Symbol	Parameter	Condition	Min	Typ	Max	Unit
Static Electrical Characteristics @ T_J = 25°C (unless otherwise stated)						
V _{(BR)DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250μA	20	--	--	V
I _{DSS}	Zero Gate Voltage Drain Current (T _c =25°C)	V _{DS} =20V, V _{GS} =0V	--	--	1	μA
	Zero Gate Voltage Drain Current (T _c =125°C)	V _{DS} =20V, V _{GS} =0V	--	--	100	μA
I _{GSS}	Gate-Body Leakage Current	V _{GS} =±8 V, V _{DS} =0V	--	--	±100	nA
V _{GS(TH)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250μA	0.4	0.8	1.2	V
R _{DS(ON)}	Drain-Source On-State Resistance	V _{GS} =2.5V, I _D =0.3A	--	180	220	mΩ
R _{DS(ON)}	Drain-Source On-State Resistance	V _{GS} =4.5V, I _D =0.5A	--	210	260	mΩ
Dynamic Electrical Characteristics @ T_J = 25°C (unless otherwise stated)						
C _{iss}	Input Capacitance	V _{DS} =10V, V _{GS} =0V, f=1MHz	--	40	--	pF
C _{oss}	Output Capacitance		--	15	--	pF
C _{rss}	Reverse Transfer Capacitance		--	6.5	--	pF
Q _g	Total Gate Charge	V _{DS} =10V, I _D =0.5A, V _{GS} =4.5V	--	1.1	--	nC
Q _{gs}	Gate-Source Charge		--	0.3	--	nC
Q _{gd}	Gate-Drain Charge		--	0.2	--	nC
Switching Characteristics						
t _{d(on)}	Turn-on Delay Time	V _{DD} =10V, I _D =0.3A, R _G =6Ω, V _{GS} =4.5V, R _L =5Ω,	--	2.2	--	nS
t _r	Turn-on Rise Time		--	4	--	nS
t _{d(off)}	Turn-Off Delay Time		--	18	--	nS
t _f	Turn-Off Fall Time		--	9	--	nS
Source- Drain Diode Characteristics						
I _{SD}	Source-drain current(Body Diode)	T _c =25°C	--	--	0.5 ^①	A
I _{SDM}	Pulsed Source-drain current (Body Diode)		--	--	3 ^①	A
V _{SD}	Forward on voltage	T _J =25°C, I _{SD} =0.5A, V _{GS} =0V	--	0.75	1.2	V

Typical Characteristics

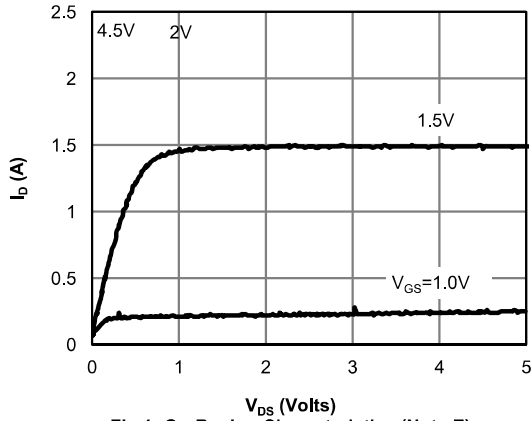


Fig 1: On-Region Characteristics (Note E)

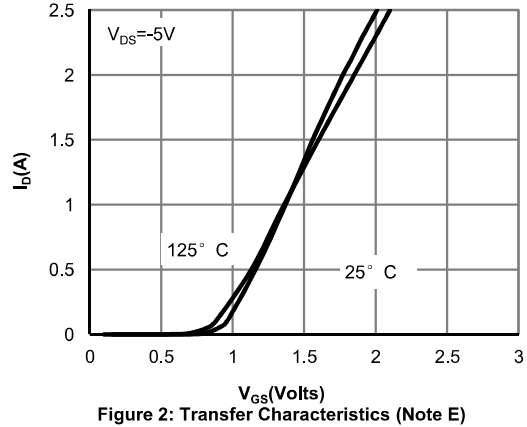


Figure 2: Transfer Characteristics (Note E)

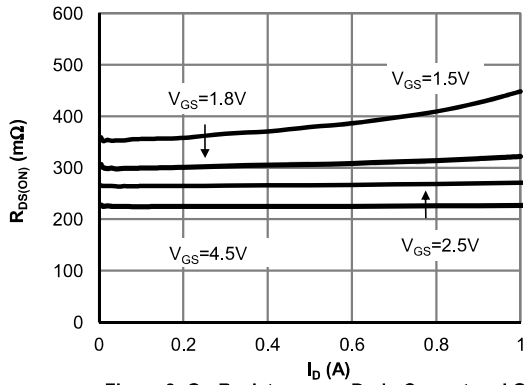


Figure 3: On-Resistance vs. Drain Current and Gate Voltage (Note E)

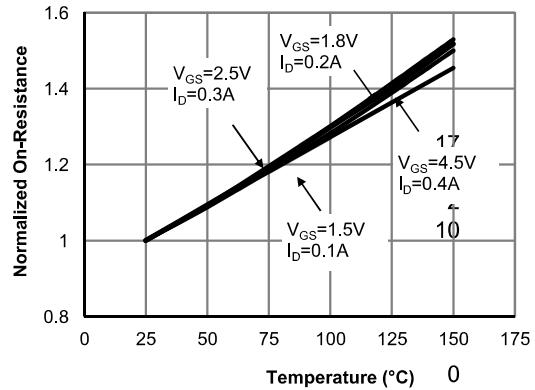


Figure 4: On-Resistance vs. Junction Temperature (Note E)

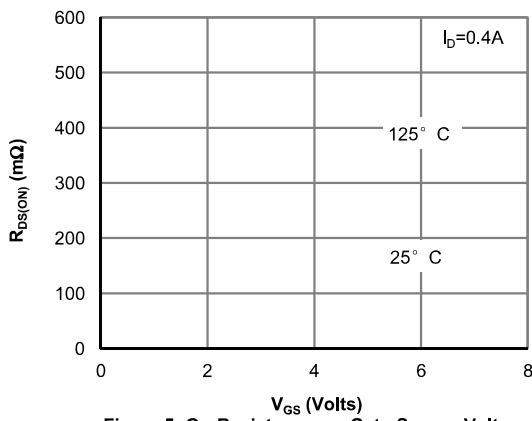


Figure 5: On-Resistance vs. Gate-Source Voltage (Note E)

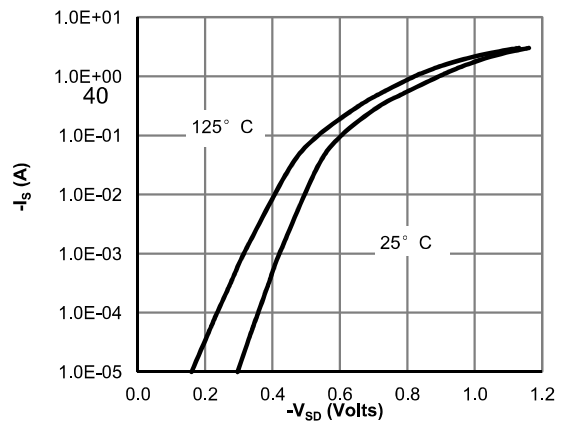


Figure 6: Body-Diode Characteristics (Note E)

AP1606
N-Channel Power MOSFET

Typical Characteristics

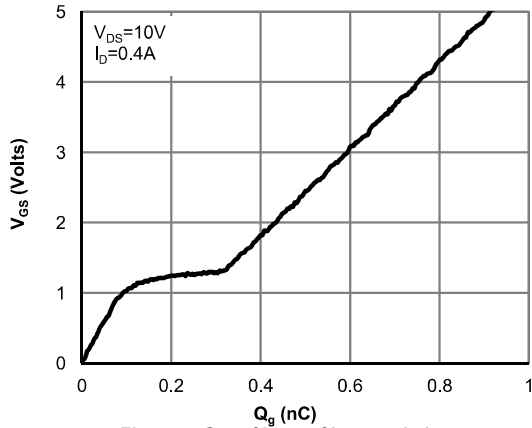


Figure 7: Gate-Charge Characteristics

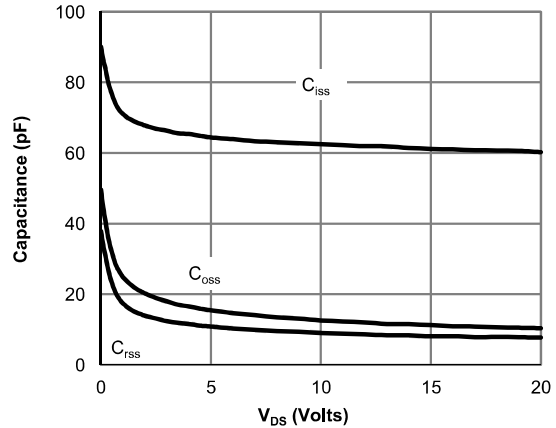


Figure 8: Capacitance Characteristics

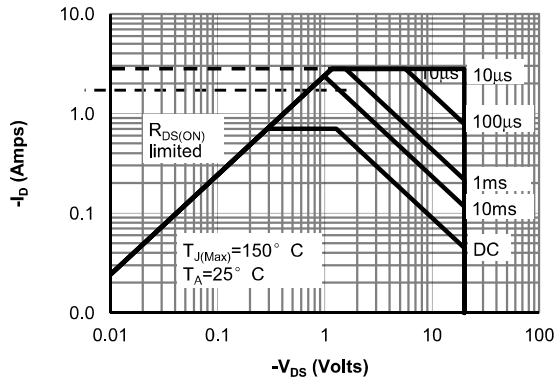


Figure 9: Maximum Forward Biased Safe Operating Area (Note B)

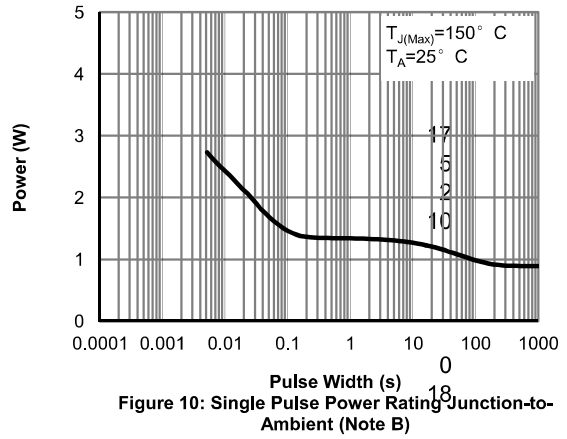


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note B)

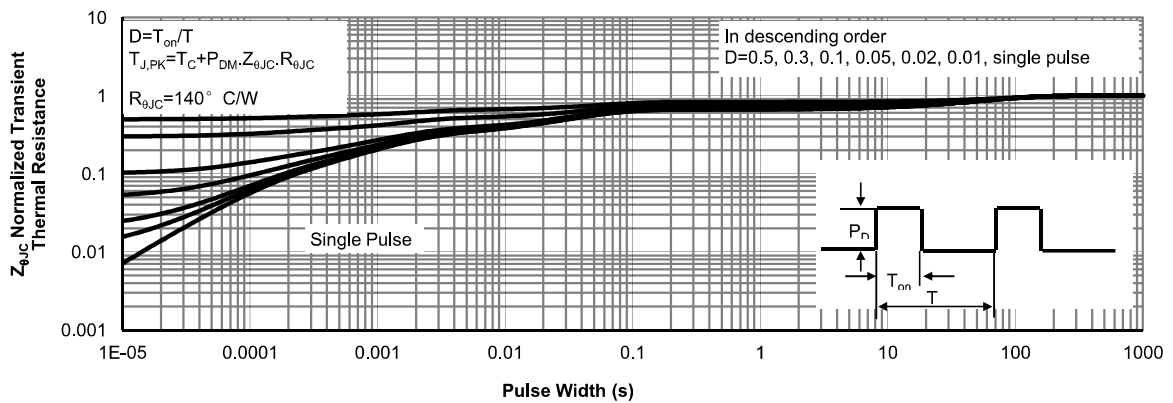


Figure 11: Normalized Maximum Transient Thermal Impedance (Note B)

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