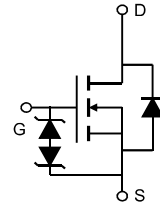


**Description**

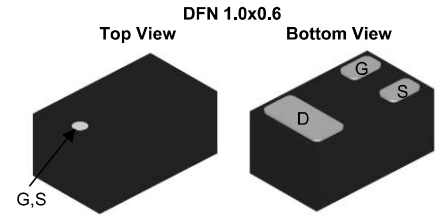
The 1606 designed by the trench processing techniques to achieve extremely low on-resistance. And fast switching speed and improved transfer effective .



Schematic diagram

**Features**

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



**Application**

- Load switch

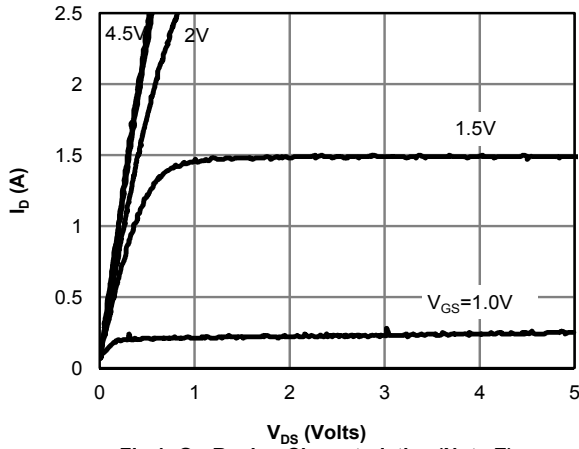
**Package Marking and Ordering Information**

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity (PCS)
1606	AP1606	DFN1006	-	-	10000

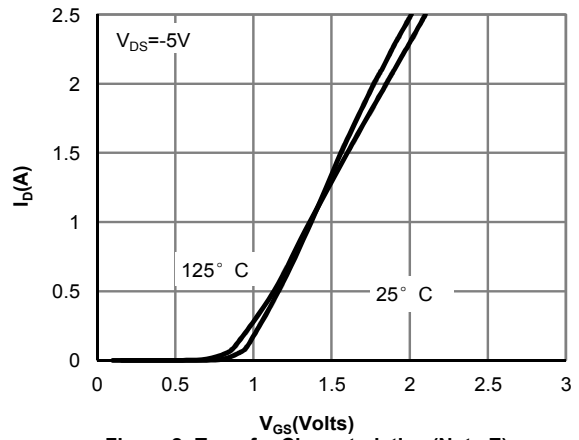
Symbol	Parameter	Rating	Unit	
<b>Common Ratings (T<sub>c</sub>=25°C Unless Otherwise Noted)</b>				
V <sub>GS</sub>	Gate-Source Voltage	±8	V	
V <sub>(BR)DSS</sub>	Drain-Source Breakdown Voltage	20	V	
T <sub>J</sub>	Maximum Junction Temperature	150	°C	
T <sub>STG</sub>	Storage Temperature Range	-50 to 150	°C	
I <sub>S</sub>	Diode Continuous Forward Current	T <sub>c</sub> =25°C	0.7	A
<b>Mounted on Large Heat Sink</b>				
I <sub>DM</sub>	Pulse Drain Current Tested	T <sub>c</sub> =25°C	3	A
I <sub>D</sub>	Continuous Drain Current	T <sub>c</sub> =25°C	0.7	A
		T <sub>c</sub> =100°C	0.5	
P <sub>D</sub>	Maximum Power Dissipation	T <sub>c</sub> =25°C	0.55	W
R <sub>θJA</sub>	Thermal Resistance Junction-Ambient		100	°C/W

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

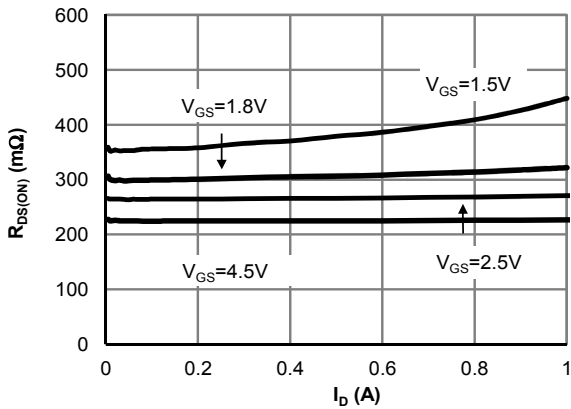
**TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS**



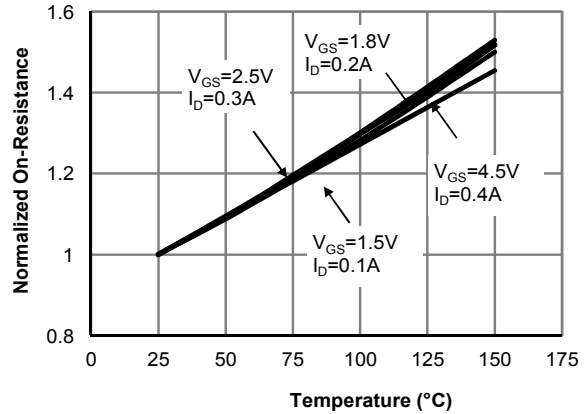
**Fig 1: On-Region Characteristics (Note E)**



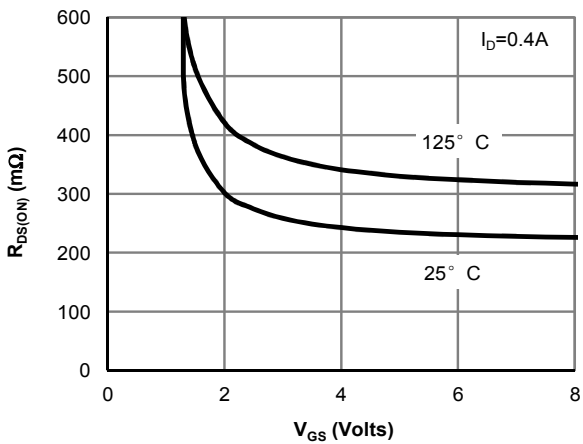
**Figure 2: Transfer Characteristics (Note E)**



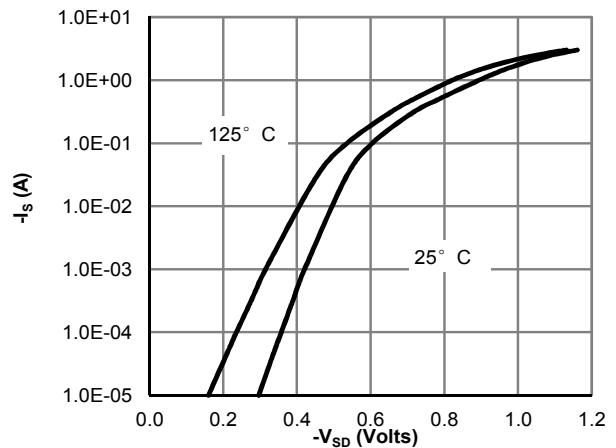
**Figure 3: On-Resistance vs. Drain Current and Gate Voltage (Note E)**



**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)**

**TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS**

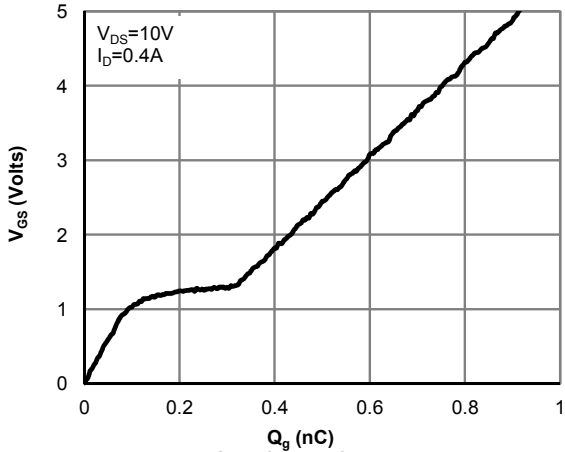


Figure 7: Gate-Charge Characteristics

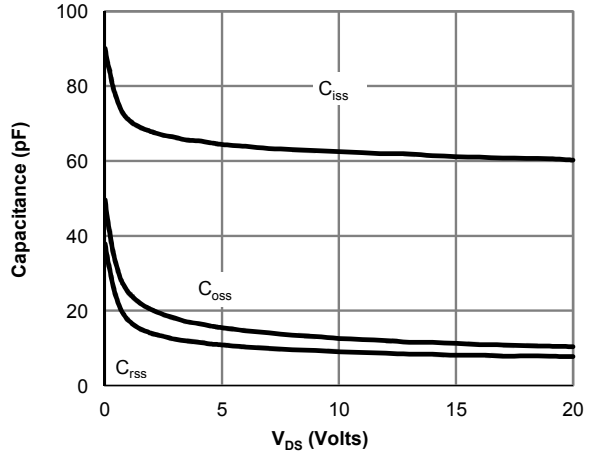


Figure 8: Capacitance Characteristics

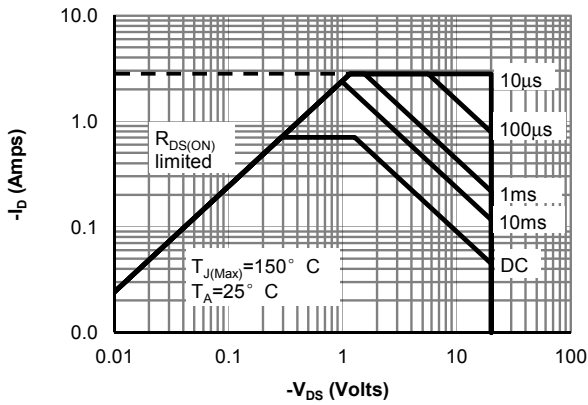


Figure 9: Maximum Forward Biased Safe Operating Area (Note B)

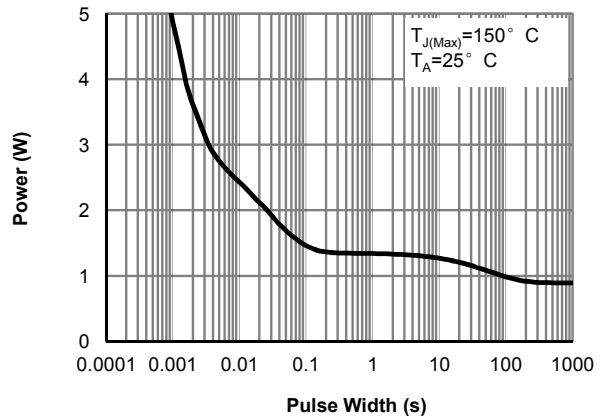


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note B)

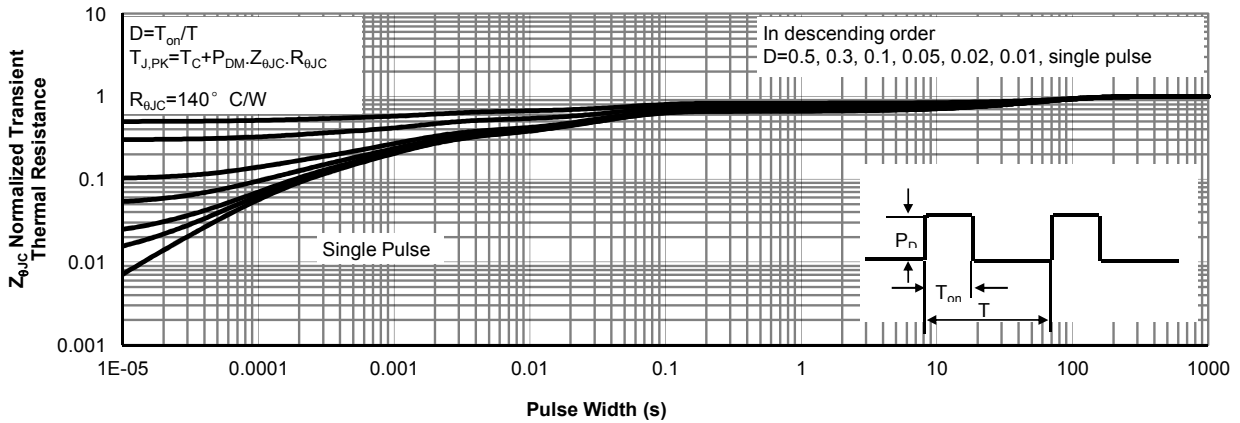
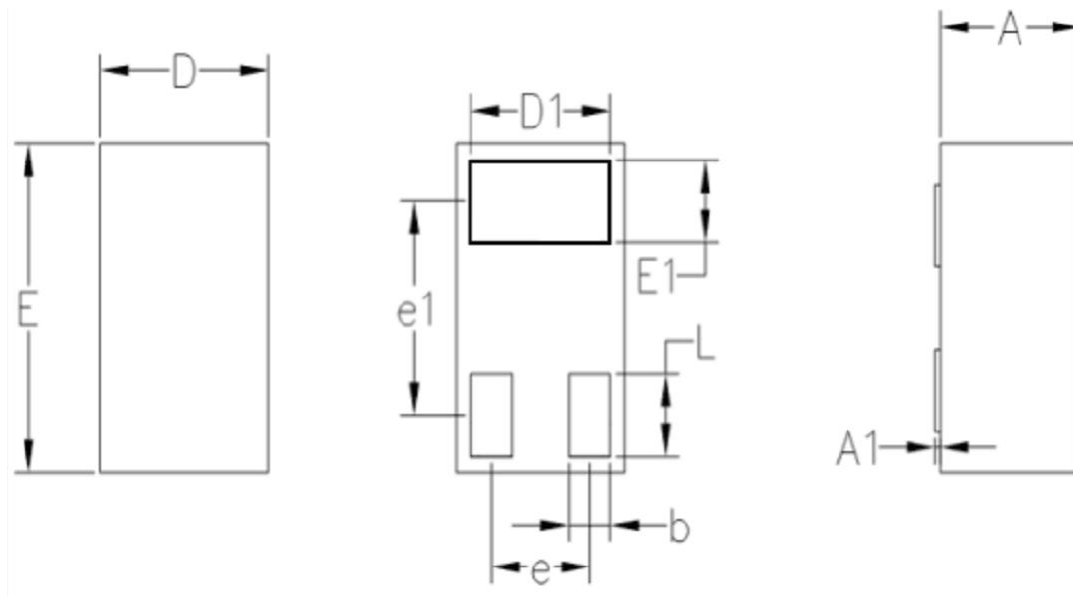


Figure 11: Normalized Maximum Transient Thermal Impedance (Note B)

**Package Dimensions**  
**DFN1006**



SYMBOL	DIMENSIONS IN MM		
	MIN	NOM	MAX
A	0.45	0.50	0.55
A1	0.00	—	0.05
D	0.55	0.60	0.65
E	0.95	1.00	1.05
D1	0.45	0.50	0.55
E1	0.20	0.25	0.30
L	0.20	0.25	0.30
b	0.10	0.15	0.20
e	0.35BSC		
e1	0.65BSC		