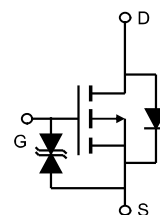


### Description

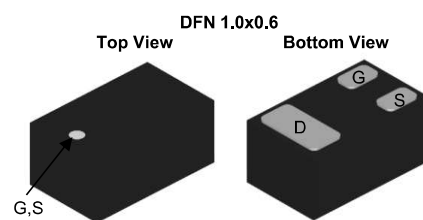
The AP1605 uses advanced trench technology to provide excellent  $R_{DS(ON)}$ , low gate charge and operation with gate voltages as low as 2.5V. This device is suitable for use as a load switch



Schematic diagram

### Features

- $V_{DS} = -20V, I_D = -0.7A$   
 $R_{DS(ON)} < 420m\Omega @ V_{GS} = -4.5V$   
 $R_{DS(ON)} < 500m\Omega @ V_{GS} = -2.5V$
- Lead free product is acquired
- Surface mount package

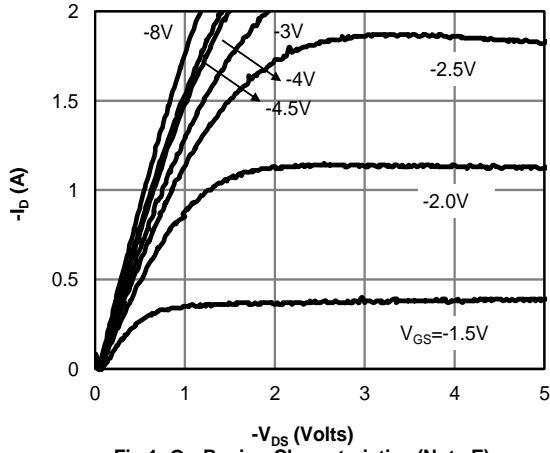


### Application

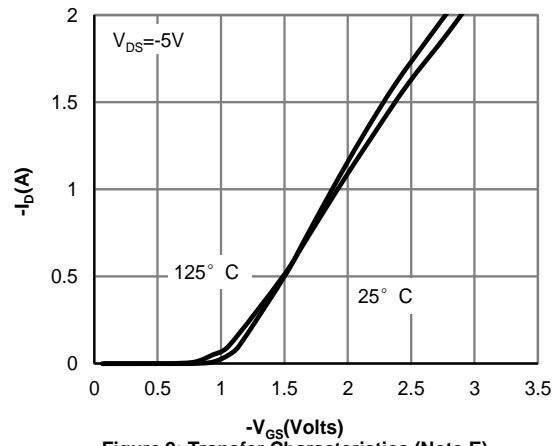
- Load switch

Symbol	Parameter		Rating	Unit
<b>Common Ratings (<math>T_c=25^\circ\text{C}</math> Unless Otherwise Noted)</b>				
$V_{GS}$	Gate-Source Voltage		$\pm 8$	V
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage		-20	V
$T_J$	Maximum Junction Temperature		150	$^\circ\text{C}$
$T_{STG}$	Storage Temperature Range		-50 to 150	$^\circ\text{C}$
$I_S$	Diode Continuous Forward Current	$T_c = 25^\circ\text{C}$	-0.7	A
<b>Mounted on Large Heat Sink</b>				
$I_{DM}$	Pulse Drain Current Tested	$T_c = 25^\circ\text{C}$	-2	A
$I_D$	Continuous Drain Current	$T_c = 25^\circ\text{C}$	-0.7	A
		$T_c = 100^\circ\text{C}$	-0.5	
$P_D$	Maximum Power Dissipation	$T_c = 25^\circ\text{C}$	0.9	W
$R_{\theta JA}$	Thermal Resistance Junction-Ambient		80	$^\circ\text{C/W}$

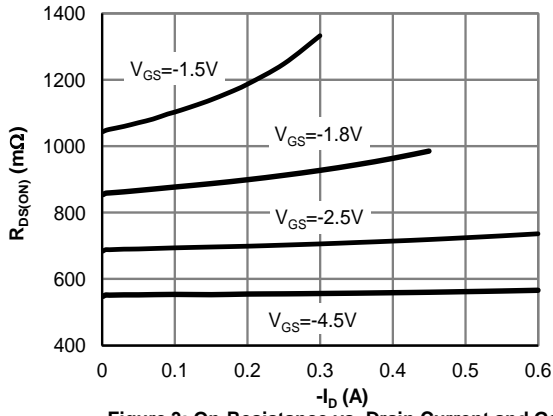
Symbol	Parameter	Condition	Min	Typ	Max	Unit
<b>Static Electrical Characteristics @ T<sub>J</sub> = 25°C (unless otherwise stated)</b>						
V <sub>(BR)DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>D</sub> =-250μA	-20	--	--	V
I <sub>DSS</sub>	Zero Gate Voltage Drain Current (T <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	-0.45	-0.6	-1.0	V
R <sub>DS(ON)</sub>	Drain-Source On-State Resistance	V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-0.5A	--	360	420	mΩ
R <sub>DS(ON)</sub>	Drain-Source On-State Resistance	V <sub>GS</sub> =-2.5V, I <sub>D</sub> =-0.3A	--	400	500	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	--	50	--	pF
C <sub>oss</sub>	Output Capacitance		--	12	--	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	--	0.8	--	nC
Q <sub>gs</sub>	Gate-Source Charge		--	0.15	--	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, R <sub>G</sub> =3Ω, V <sub>GS</sub> =-4.5V, R <sub>L</sub> =25Ω,	--	6	--	nS
t <sub>r</sub>	Turn-on Rise Time		--	5	--	nS
t <sub>d(off)</sub>	Turn-Off Delay Time		--	23	--	nS
t <sub>f</sub>	Turn-Off Fall Time		--	8	--	nS
<b>Source- Drain Diode Characteristics</b>						
I <sub>SD</sub>	Source-drain current(Body Diode)	T <sub>c</sub> =25°C	--	--	-0.7	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	--	--	-1.2	V



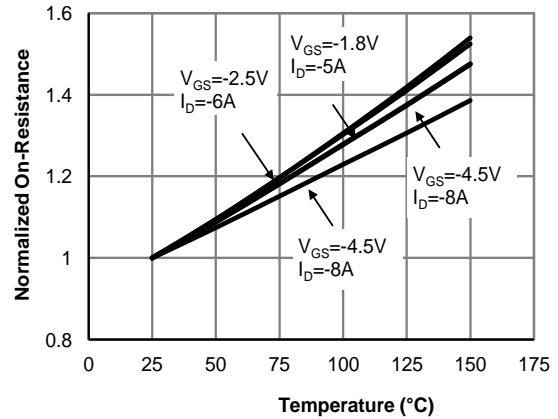
**Fig 1: On-Region Characteristics (Note E)**



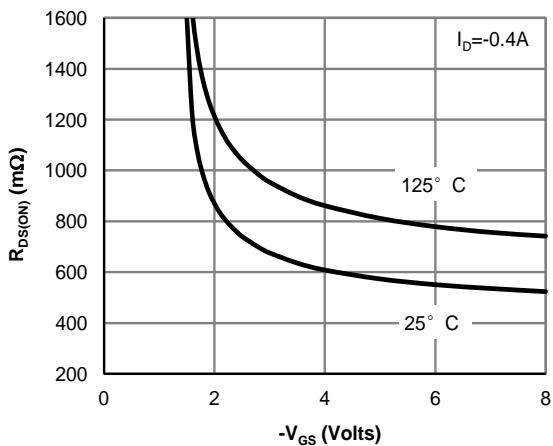
**Figure 2: Transfer Characteristics (Note E)**



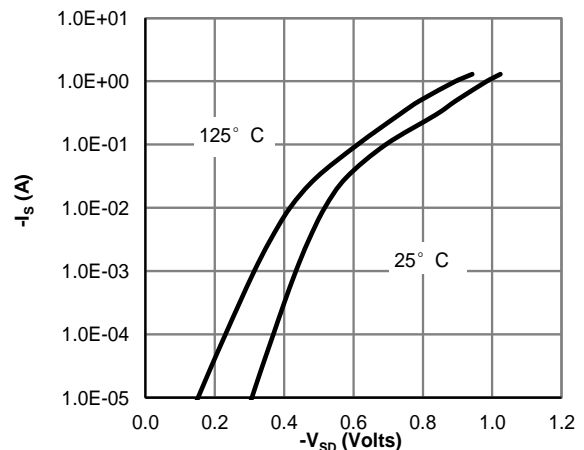
**Figure 3: On-Resistance vs. Drain Current and Gate Voltage (Note E)**



**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)**

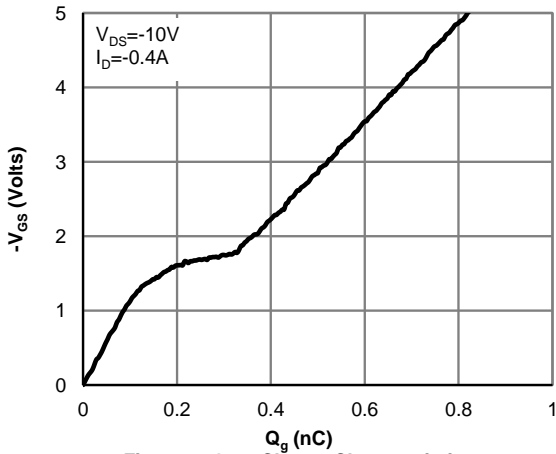


Figure 7: Gate-Charge Characteristics

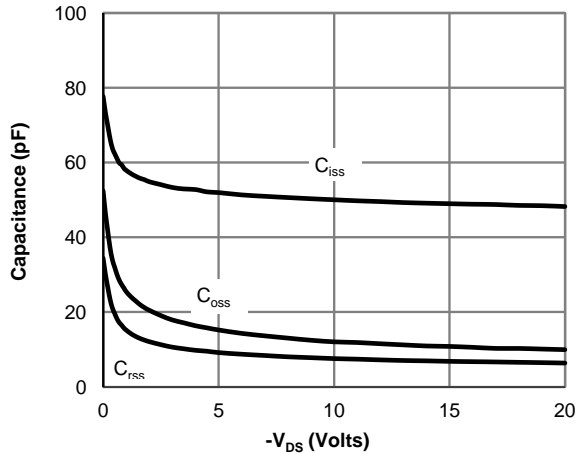


Figure 8: Capacitance Characteristics

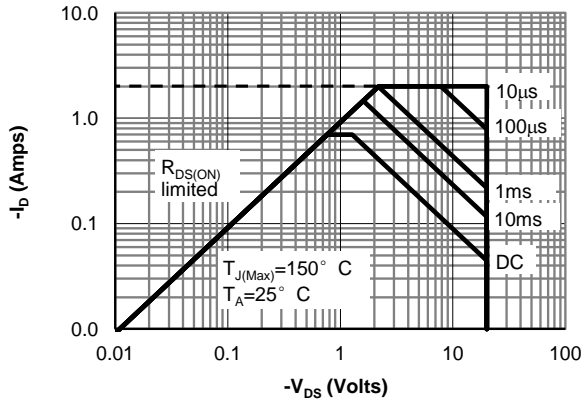


Figure 9: Maximum Forward Biased Safe Operating Area (Note B)

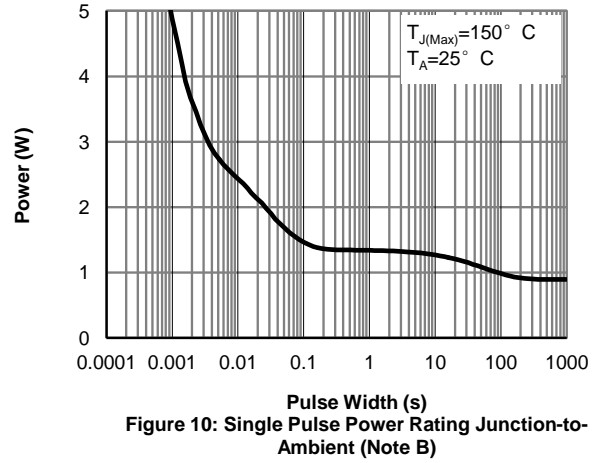


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note B)

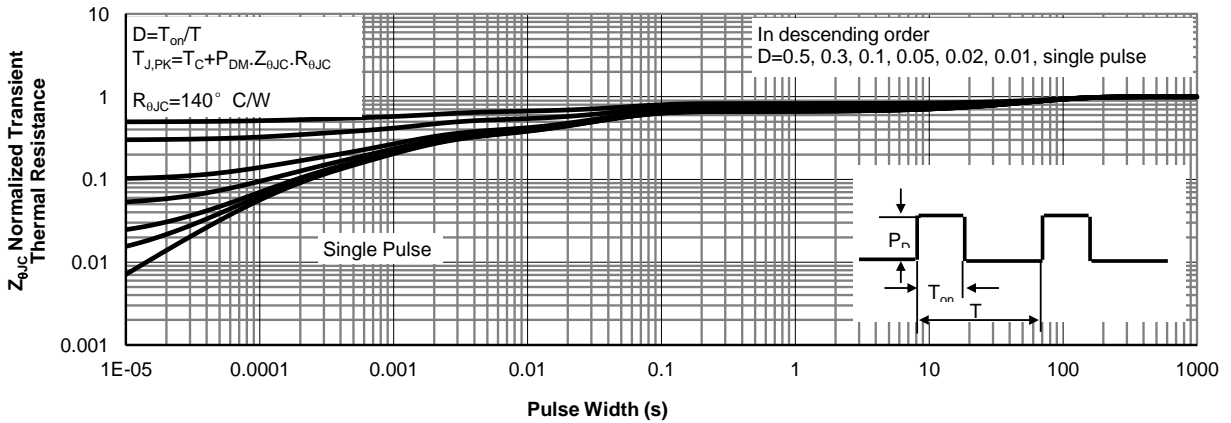
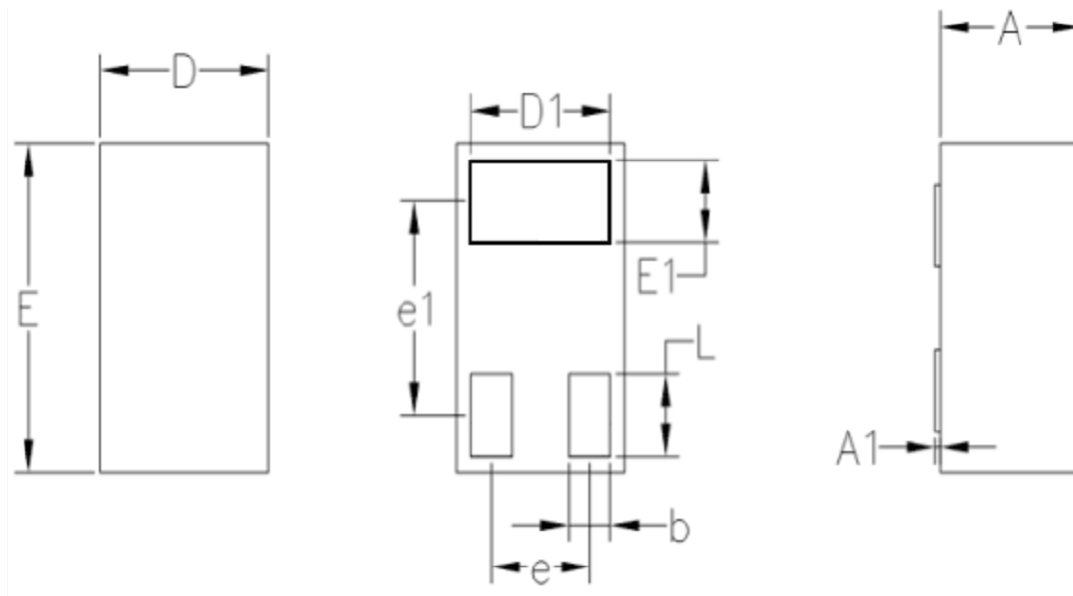


Figure 11: Normalized Maximum Transient Thermal Impedance (Note B)

**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		