

• General Description

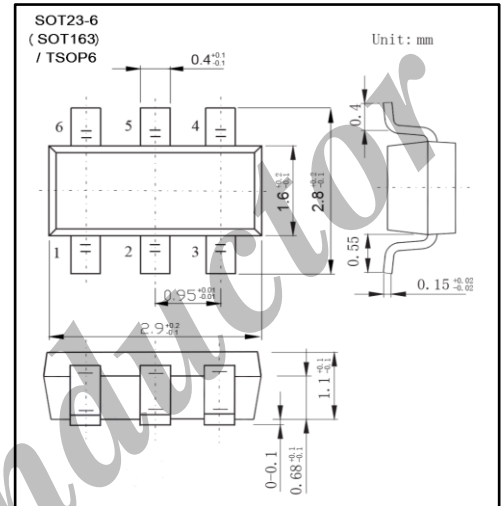
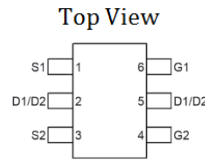
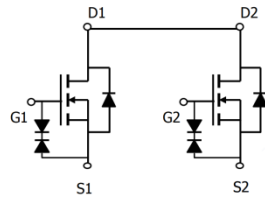
- AP8810T combines advanced MOSFET technology with a low resistance package to provide extremely low $R_{DS(ON)}$. This device is most suitable for Li-ion battery management applications.
- ESD Protected

• Applications

- Li-ion battery management applications

• Product Summary

V_{DS}	20V
I_D	7A
$R_{DS(ON)}$ (at $V_{GS} = 4.5V$)	< 20m Ω
$R_{DS(ON)}$ (at $V_{GS} = 2.5V$)	< 30m Ω
$R_{DS(ON)}$ (at $V_{GS} = 1.8V$)	< 50m Ω
ESD Protection	2kV HBM



• Absolute Maximum Ratings $T_a = 25^\circ C$

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	20	V
Gate-Source Voltage	V_{GS}	± 8	V
Continuous Drain Current	I_D	$T_a = 25^\circ C$	7
		$T_a = 70^\circ C$	5.7
Pulsed Drain Current	I_{DM}	25	A
Power Dissipation	P_D	$T_a = 25^\circ C$	1.5
		$T_a = 70^\circ C$	1
Junction and Storage Temperature Range	T_J, T_{STG}	-55 to 150	$^\circ C$
Thermal Characteristics			
Thermal Resistance. Junction-to-Ambient	$R_{\theta JA}$	$t \leq 10s$	90
		Steady State	130
Thermal Resistance. Junction-to-Lead	$R_{\theta JL}$	72	$^\circ C/W$

• **Electrical Characteristics Ta = 25°C**

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Static Parameters						
Drain-Source Breakdown Voltage	V_{DSS}	$I_D=250\mu A, V_{GS}=0V$	20			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=20V, V_{GS}=0V$			1	μA
		$V_{DS}=20V, V_{GS}=0V, T_J=55^\circ C$			5	
Gate-Body Leakage Current	I_{GSS}	$V_{DS}=0V, V_{GS}=\pm 8V$			± 10	μA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	0.4	0.7	1.1	V
On-State Drain Current	$I_{D(ON)}$	$V_{GS}=4.5V, V_{DS}=5V$	25			A
Static Drain-Source On-Resistance	$R_{DS(ON)}$	$V_{GS}=4.5V, I_D=7A$			20	m Ω
		$V_{GS}=2.5V, I_D=5.5A$			30	
		$V_{GS}=1.8V, I_D=5A$			50	
Forward Transconductance	g_{FS}	$V_{DS}=5V, I_D=7A$		12		S
Diode Forward Voltage	V_{SD}	$I_S=1A, V_{GS}=0V$			1	V
Maximum Body-Diode Continuous Current	I_S				2	A
Dynamic Parameters						
Input Capacitance	C_{iss}	$V_{GS}=0V, V_{DS}=10V, f=1MHz$		1200		pF
Output Capacitance	C_{oss}			160		
Reverse Transfer Capacitance	C_{rss}			80		
Switching Parameters						
Total Gate Charge (4.5V)	Q_g	$V_{GS}=4.5V, V_{DS}=10V, I_D=7A$			14	nC
Gate Source Charge	Q_{gs}			4.2		
Gate Drain Charge	Q_{gd}			2.6		
Turn-On Delay Time	$t_{D(on)}$	$V_{GS}=4.5V, V_{DS}=10V, R_L=1.54\Omega, R_{GEN}=3\Omega$		270		ns
Turn-On Rise Time	t_r			320		
Turn-Off Delay Time	$t_{D(off)}$			3		
Turn-Off Fall Time	t_f			2.2		
Body Diode Reverse Recovery Time	t_{rr}	$I_F=18A, d_i/d_t=100A/\mu s$		30		
Body Diode Reverse Recovery Charge	Q_{rr}	$I_F=18A, d_i/d_t=100A/\mu s$		6.5		nC

• **Ordering Information**

Ordering Part Number	Package	MOQ
AP8810T	SOT23-6 (SOT163) / TSOP6	3,000 pcs / reel

THIS PRODUCT HAS BEEN DESIGNED AND QUALIFIED FOR THE CONSUMER MARKET. APPLICATIONS OR USES AS CRITICAL COMPONENTS IN LIFE SUPPORT DEVICES OR SYSTEMS ARE NOT AUTHORIZED. APOLLO SEMICONDUCTOR DOES NOT ASSUME ANY LIABILITY ARISING OUT OF SUCH APPLICATIONS OR USES OF ITS PRODUCTS. APOLLO SEMICONDUCTOR RESERVES THE RIGHT TO IMPROVE PRODUCT DESIGN, FUNCTIONS AND RELIABILITY WITHOUT NOTICE.

• Typical Electrical and Thermal Characteristics

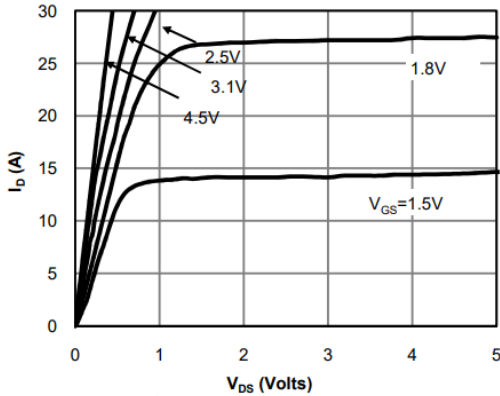


Fig 1: On-Region Characteristics

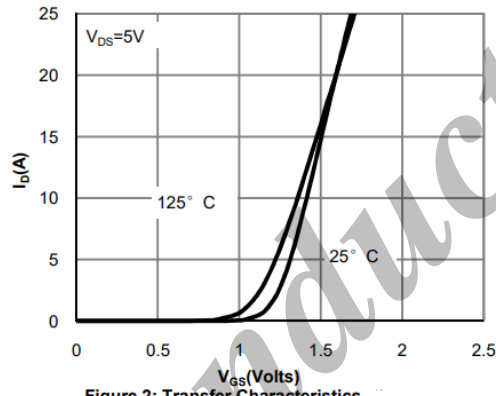


Figure 2: Transfer Characteristics

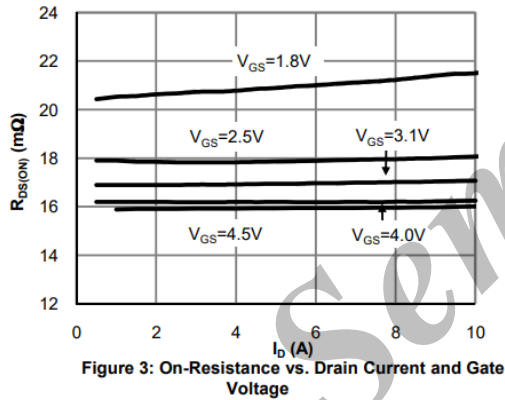


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

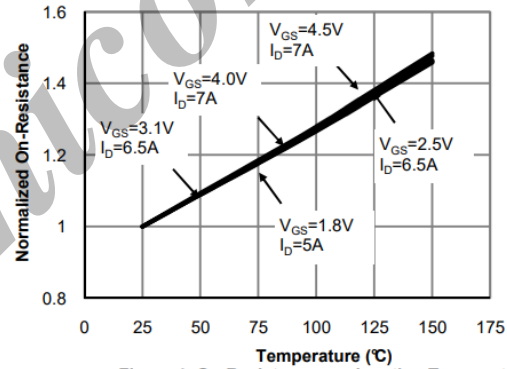


Figure 4: On-Resistance vs. Junction Temperature

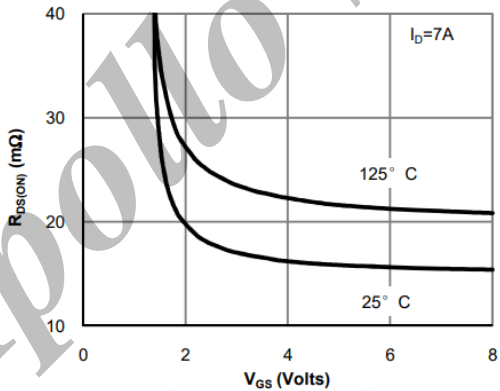


Figure 5: On-Resistance vs. Gate-Source Voltage

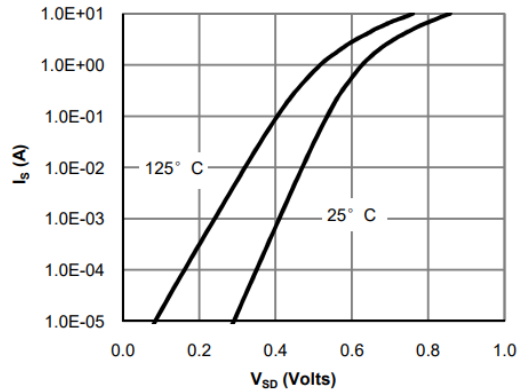


Figure 6: Body-Diode Characteristics

Note 1: The static characteristics in Figure 1 to 6 are obtained using $300\mu A$ pulses, duty cycle 0.5% max.

• Typical Electrical and Thermal Characteristics

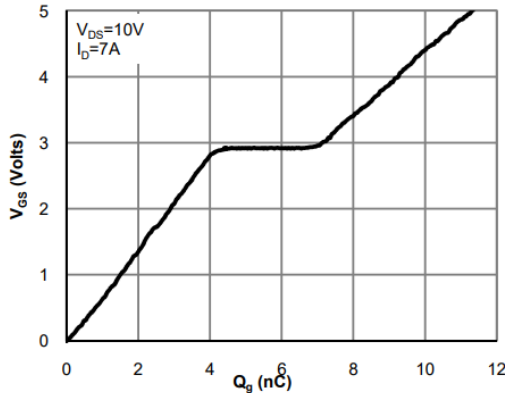


Figure 7: Gate-Charge Characteristics

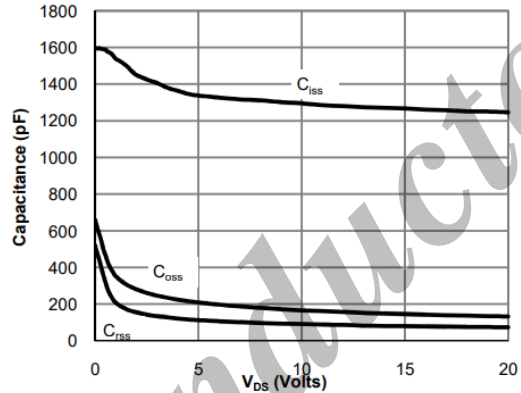


Figure 8: Capacitance Characteristics

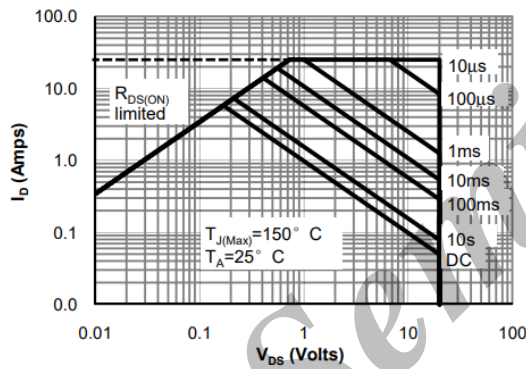


Figure 9: Maximum Forward Biased Safe Operating Area

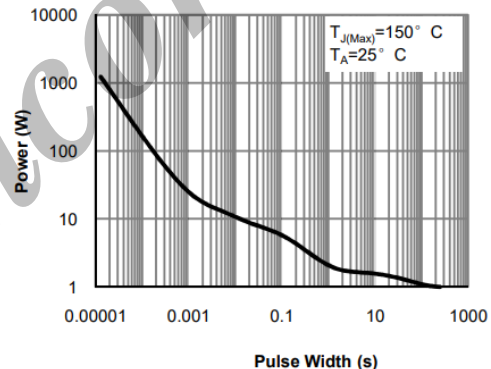


Figure 10: Single Pulse Power Rating Junction-to-Ambient

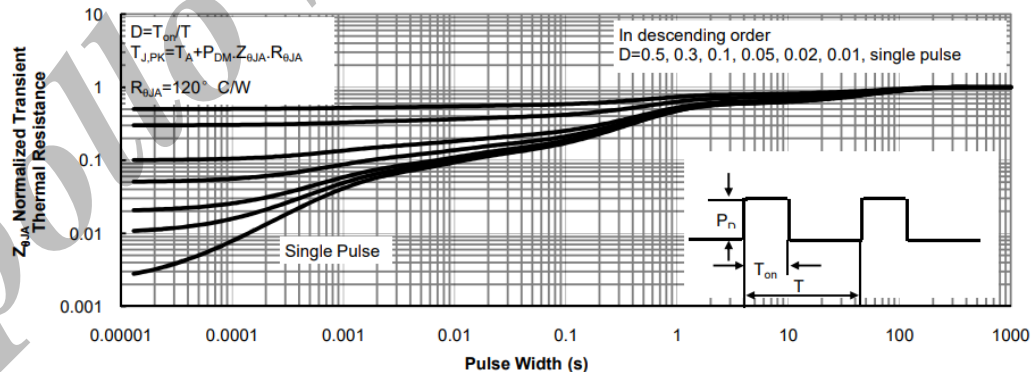


Figure 11: Normalized Maximum Transient Thermal Impedance

Note 2: The curves in Figure 9 to 11 are based on the junction-to-ambient thermal impedance which is measured with the device mounted on 1in² FR-4 board with 2oz. copper, assuming a maximum junction temperature of T_{J(MAX)}=150°C. The SOA curve provides a single pulse rating.

Disclaimer

ALL PRODUCT, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE TO IMPROVE RELIABILITY, FUNCTION OR DESIGN OR OTHERWISE.

Apollo Semiconductor Ltd., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, "Apollo"), disclaim any and all liability for any errors, inaccuracies or incompleteness contained in any datasheet or in any other disclosure relating to any product.

Apollo makes no warranty, representation or guarantee regarding the suitability of the products for any particular purpose or the continuing production of any product. To the maximum extent permitted by applicable law, Apollo disclaims (i) any and all liability arising out of the application or use of any product, (ii) any and all liability, including without limitation special, consequential or incidental damages, and (iii) any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.

Statements regarding the suitability of products for certain types of applications are based on Apollo's knowledge of typical requirements that are often placed on Apollo products in generic applications. Such statements are not binding statements about the suitability of products for a particular application. It is the customer's responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application. Parameters provided in datasheets and / or specifications may vary in different applications and performance may vary over time. All operating parameters, including typical parameters, must be validated for each customer application by the customer's technical experts. Product specifications do not expand or otherwise modify Apollo's terms and conditions of purchase, including but not limited to the warranty expressed therein.

Except as expressly indicated in writing, Apollo products are not designed for use in medical, life-saving, or life-sustaining applications or for any other application in which the failure of the Apollo product could result in personal injury or death. Customers using or selling Apollo products not expressly indicated for use in such applications do so at their own risk. Please contact authorized Apollo personnel to obtain written terms and conditions regarding products designed for such applications.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Apollo. Product names and markings noted herein may be trademarks of their respective owners.