DESCRIPTION

The A4770 is an integrated 100mΩ power switch for self-powered and bus-powered Universal Series Bus (USB) applications. A built-in charge pump is used to drive the N-channel NMOSFET that is free of parasitic body diode to eliminate any reversed current flow across the switch when it is powered off. Its low quiescent supply current (23μA) and small package (SOT-25) is particularly suitable in battery-powered portable equipment.

Several protection functions include soft start to limit inrush current during plug-in, current limiting at 1.1/1.3A to meet USB power requirement, and thermal shutdown to protect damage under over current conditions.

The A4770 is available in SOT-25 package.

ORDERING INFORMATION

Package Type	Part Number	
SOT-25 SPQ: 3,000pcs/Reel	E5	A4770E5R-XY
		A4770E5VR-XY
Note	X=Maximum Current A=1.1A B=1.3A Y=Package Type (See Pin Description) A=A Type B=B Type V: Halogen free Package R: Tape & Reel	
AiT provides all RoHS products		

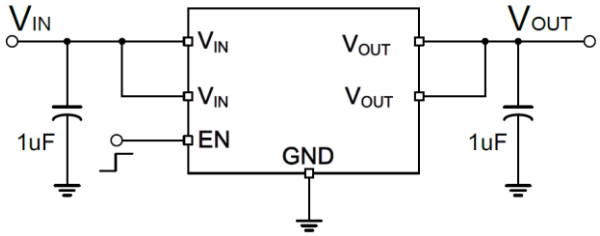
FEATURES

- 100mΩ (Typ.) High-Side NMOSFET (SOT-25)
- 1.1/1.3A Current Limit
- Small SOT-25 Package Minimizes Board Space
- Soft Start
- Thermal Protection
- Low 23μA Supply Current
- Wide Input Voltage Range: 2.2V ~ 6V
- Available in SOT-25 package

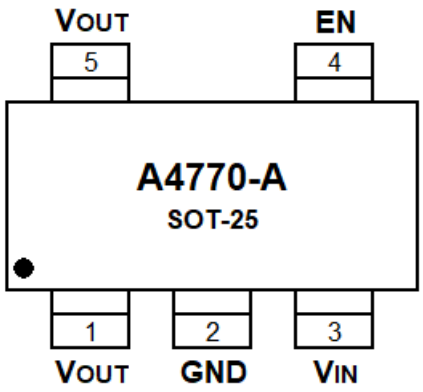
APPLICATION

- Battery-Powered Equipment
- Motherboard USB Power Switch
- USB Device Power Switch
- Hot-Plug Power Supplies
- Battery-Charger Circuits

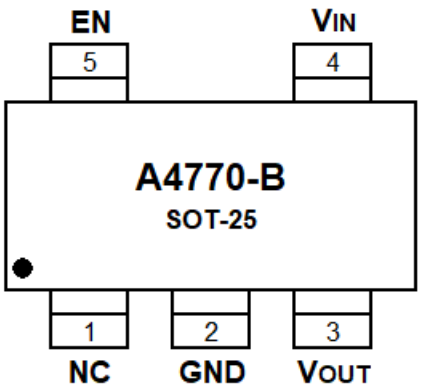
TYPICAL APPLICATION



PIN DESCRIPTION



Top View



Top View

Pin #		Symbol	Function
Type A	Type B		
1, 5	3	V_{OUT}	Output Voltage
2	2	GND	Ground
3	4	V_{IN}	Power Input
4	5	EN	Chip Enable
-	1	NC	No Connected

ABSOLUTE MAXIMUM RATINGS

V_{DD}, Input Voltage		7.0V
V_{EN}, EN to GND Voltage		-0.3V ~ 7.0V
P_D, Power Dissipation, T_A = 25℃	SOT-25	0.25W
θ_{JA}, Thermal Resistance	SOT-25	250℃/W
Lead Temperature (Soldering, 10 sec.)		260℃
T_{STG}, Storage Temperature Range		-65℃ ~ 150℃
Operating Ambient Temperature		-20℃ ~ 100℃
ESD Susceptibility	HBM	6000V
	MM	600V

Stress beyond above listed “Absolute Maximum Ratings” may lead permanent damage to the device. These are stress ratings only and operations of the device at these or any other conditions beyond those indicated in the operational sections of the specifications are not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

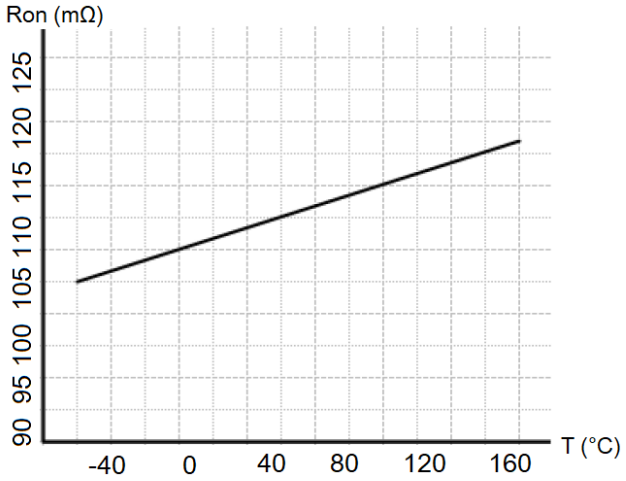
ELECTRICAL CHARACTERISTICS

V_{IN} = 5V, C_{IN} = C_{OUT} = 1μF, unless otherwise noted. Typical values are at T_A = + 25°C.

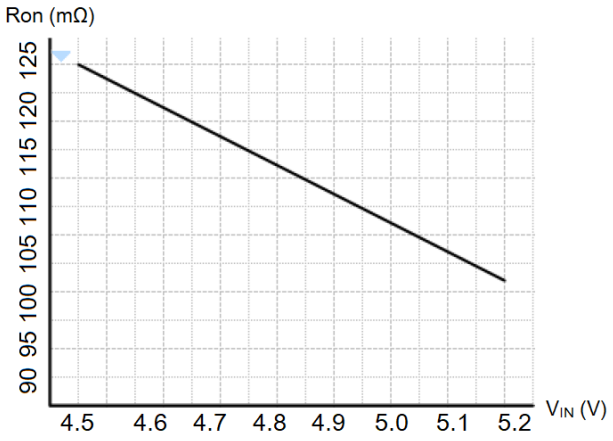
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Input Voltage Range	V_{IN}		2.2	-	6	V
NMOS Output On-Resistance	$R_{DS(ON)}$	I_L = 500mA	-	100	110	mΩ
Quiescent Current	I_Q	V_{IN} = 3V	-	19	40	μA
		V_{IN} = 5V	-	23	45	
Turn-On Time	t_R	R_L = 10Ω, 90% Settling	-	400	-	μs
Current Limit Setting	I_{LIMIT}	A4770E5R-A	1.1	1.3	1.5	A
		A4770E5R-B	1.3	1.5	1.7	
EN PIN Input High Voltage	-		1.5	-	-	V
EN PIN Input Low Voltage	-		-	-	0.8	V
Shutdown Current	I_{OFF}	EN = “0”	-	0.1	1	μA
Output Leakage Current	$I_{LEAKAGE}$	EN = “0”, V_{OUT} = 0V	-	0.5	10	μA
V_{IN} Under Voltage Lockout	UVLO		1.3	1.8	-	V
V_{IN} Under Voltage Hysteresis	-		-	100	-	mV
Thermal Limit	T_{SD}		-	130	-	°C
Thermal Limit Hysteresis	ΔT_{SD}		-	20	-	°C

TYPICAL PERFORMANCE CHARACTERISTICS

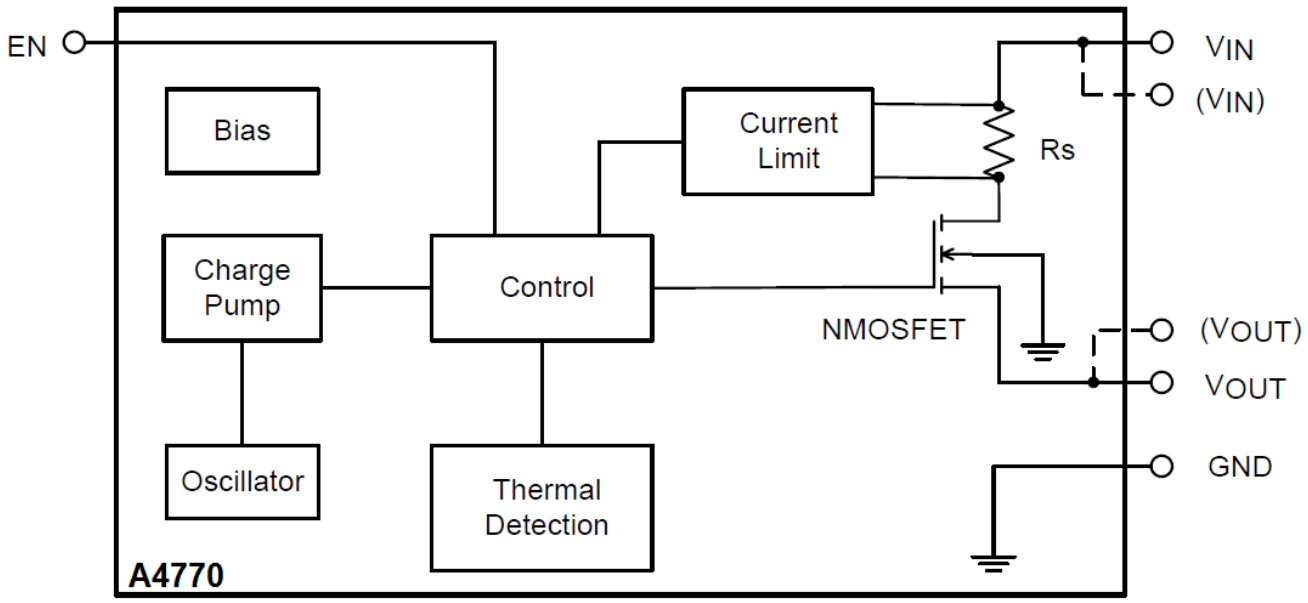
1. Ron vs. Temp



2. Ron vs. V_{IN}

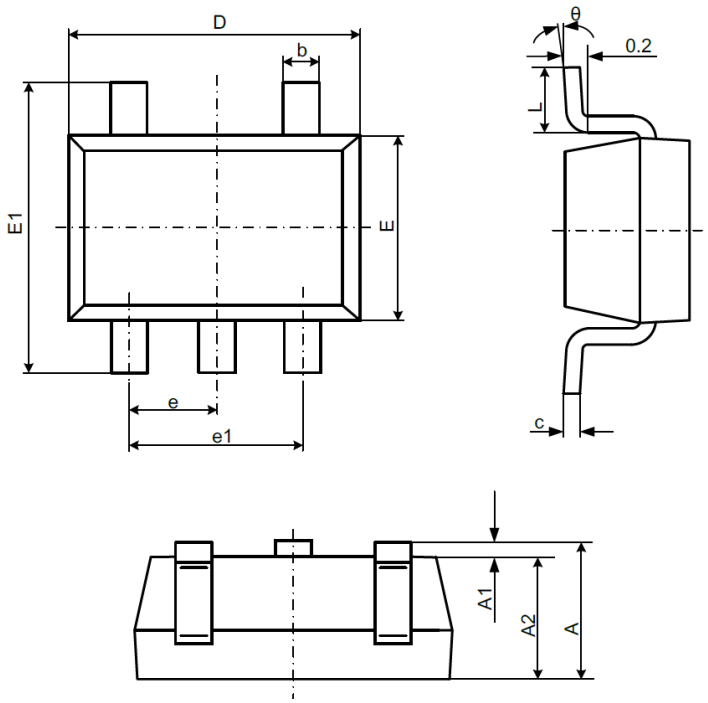


BLOCK DIAGRAM



PACKAGE INFORMATION

Dimension in SOT-25 (Unit: mm)



Symbol	Millimeters		Inches	
	Min	Max	Min	Max
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	1.500	1.700	0.059	0.067
E1	2.650	2.950	0.104	0.116
e	0.950 BSC		0.037 BSC	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°

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