

30V N-Channel Enhancement Mode MOSFET

Description

The AP3410MI uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 4.5V. This device is suitable for use as a Battery protection or in other Switching application.

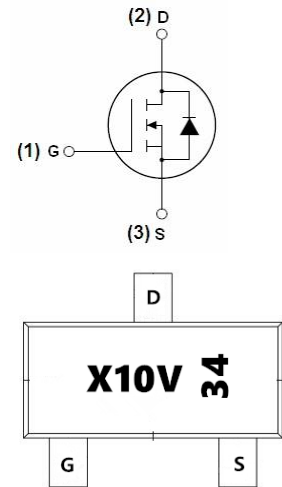
General Features

$V_{DS} = 30V$ $I_D = 6A$

$R_{DS(ON)} < 20m\Omega @ V_{GS}=10V$

Application

- Battery protection
- Load switch
- Uninterruptible power supply



Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
AP3410MI	SOT-23-3L	X10V-34	3000

Absolute Maximum Ratings (TA=25°C unless otherwise noted)

parameter		symbol	limit	unit
Drain-source voltage		V_{DS}	30	V
Gate-source voltage		V_{GS}	± 20	V
Continuous Drain Current	$T_A=25^\circ C$	I_D	6	A
	$T_A=75^\circ C$		5	A
Pulsed Drain Current		I_{DM}	24	A
Avalanche energy(L=0.1mH)		EAS,EAR	114	mJ
Maximum power dissipation		P_D	1.4	W
Operating junction Temperature range		T_j	-55—150	$^\circ C$
Maximum Junction-to-Ambient ^A	$\leq 10s$	$R_{\theta JA}$ $R_{\theta JC}$	65	90
Maximum Junction-to-Ambient ^A	Steady-State		85	125
Maximum Junction-to-Lead ^B			63	80

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Electrical Characteristics (TA=25°C unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Drain-source breakdown voltage	BV _{DSS}	V _{GS} =0V, I _D =250μA	30	-	-	V
Zero gate voltage drain current	IDSS	V _{DS} =30V, V _{GS} =0V	-	-	1	μA
Gate-body leakage	IGSS	V _{DS} =0V, V _{GS} =±20V	-	-	±100	nA
Gate threshold voltage	VGS(th)	V _{DS} =V _{GS} , I _D =250μA	0.8	1.4	2.0	V
Drain-source on-state resistance	RDS(ON)	V _{GS} =10V, I _D =6A	-	16	20	mΩ
		V _{GS} =4.5V, I _D =5A		21	26	
Forward transconductance	gfs	V _{GS} =5V, I _D =6A	-	22	-	S
Input capacitance	C _{iss}	V _{DS} =15V, V _{GS} =0V f=1.0MHz		370		pF
Output capacitance	COSS			65		
Reverse transfer capacitance	CRSS			40		
Turn-on delay time	tD(ON)	V _{DS} =15V V _{GS} =10V R _L =2.6 ohm R _{GEN} =3ohm	-	4.5	-	ns
Rise time	tr		-	2.5	-	
Turn-off delay time	tD(OFF)		-	14.5	-	
Fall time	tf		-	2.5	-	
Total gate charge	Qg	V _{DS} =15V, I _D =6A V _{GS} =10V	-	7.1	-	nC
Gate-source charge	Qgs		-	1.4	-	
Gate-drain charge	Qgd		-	1.7	-	
Diode forward voltage	V _{SD}	V _{GS} =0V, I _S =1A	-	0.82	1.16	V

Notes:

- 1、 surface mounted on FR4 board, t≤10sec
- 2、 pulse test: pulse width≤300μs, duty≤2%
- 3、 guaranteed by design, not subject to production testing

Typical Performance Characteristics

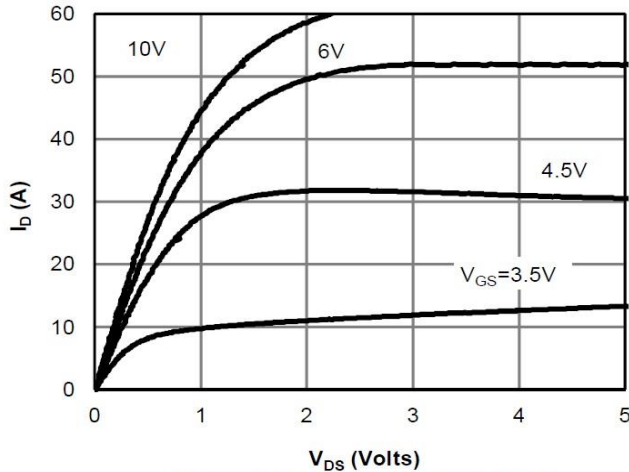


Figure 1: On-Region Characteristics

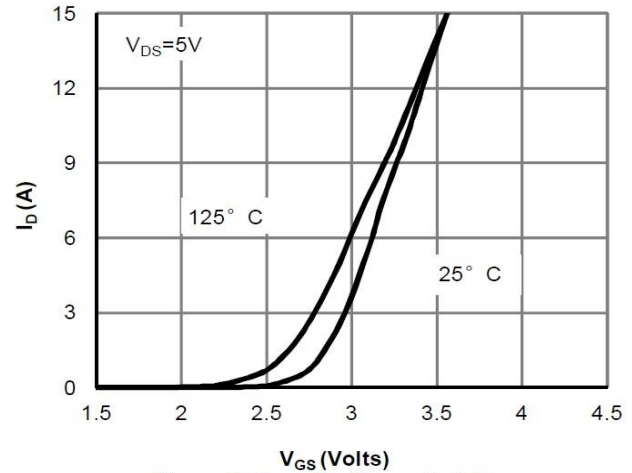


Figure 2: Transfer Characteristics

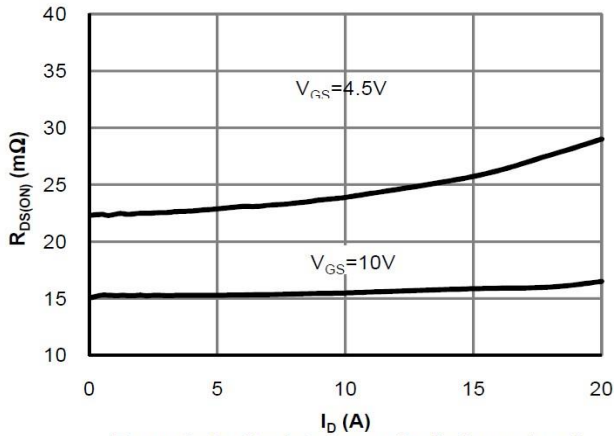


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

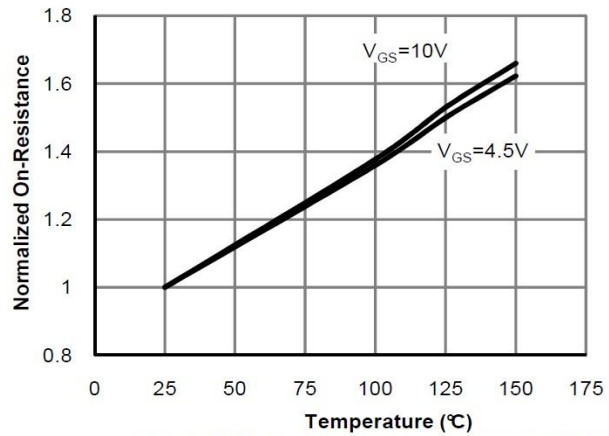


Figure 4: On-Resistance vs. Junction Temperature

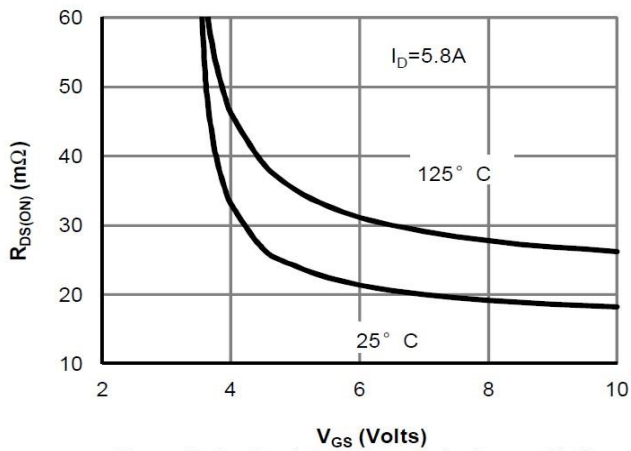


Figure 5: On-Resistance vs. Gate-Source Voltage

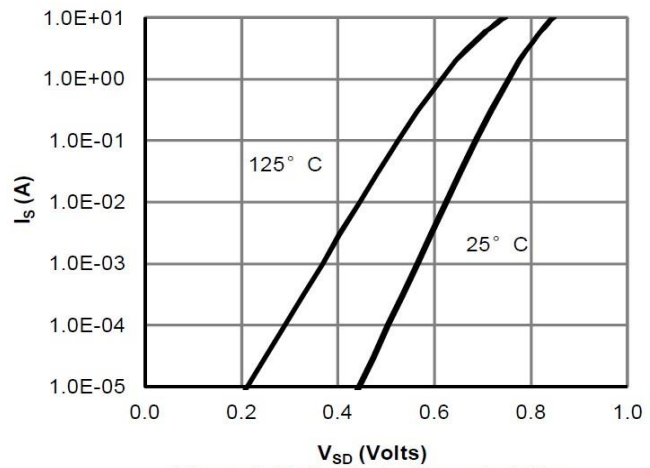


Figure 6: Body-Diode Characteristics

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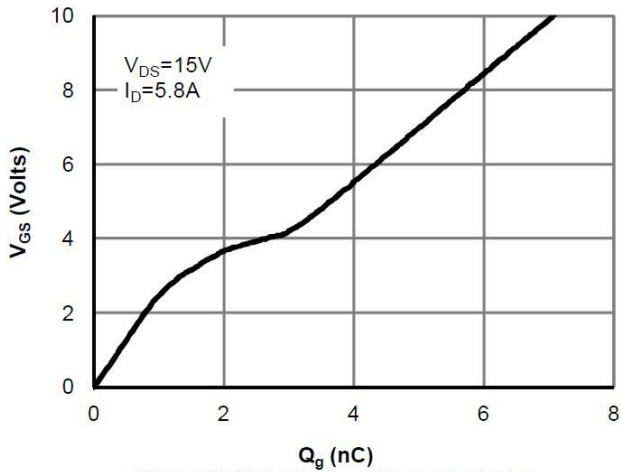


Figure 7: Gate-Charge Characteristics

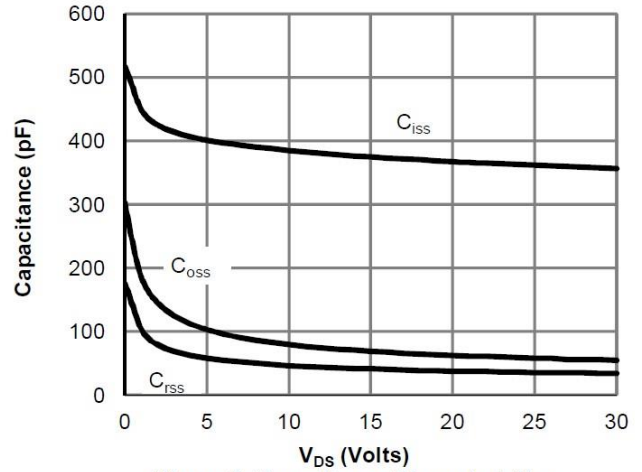


Figure 8: Capacitance Characteristics

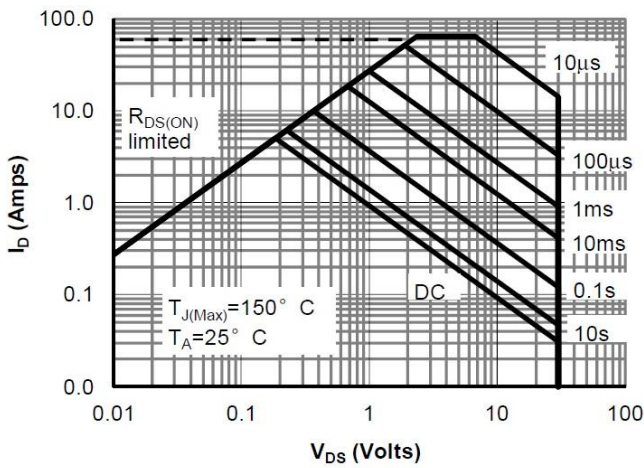


Figure 9: Maximum Forward Biased Safe Operating Area

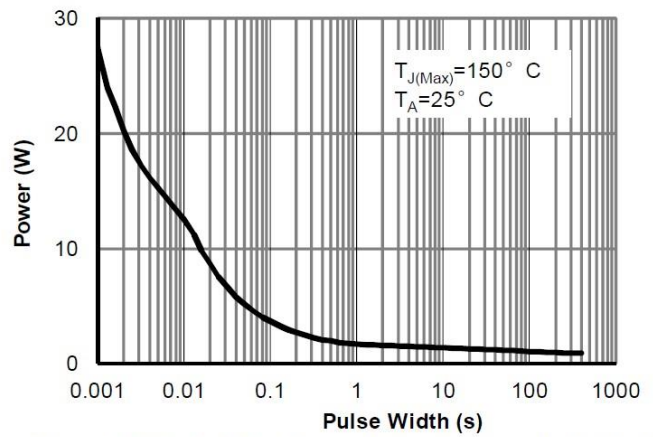


Figure 10: Single Pulse Power Rating Junction-to-Ambient

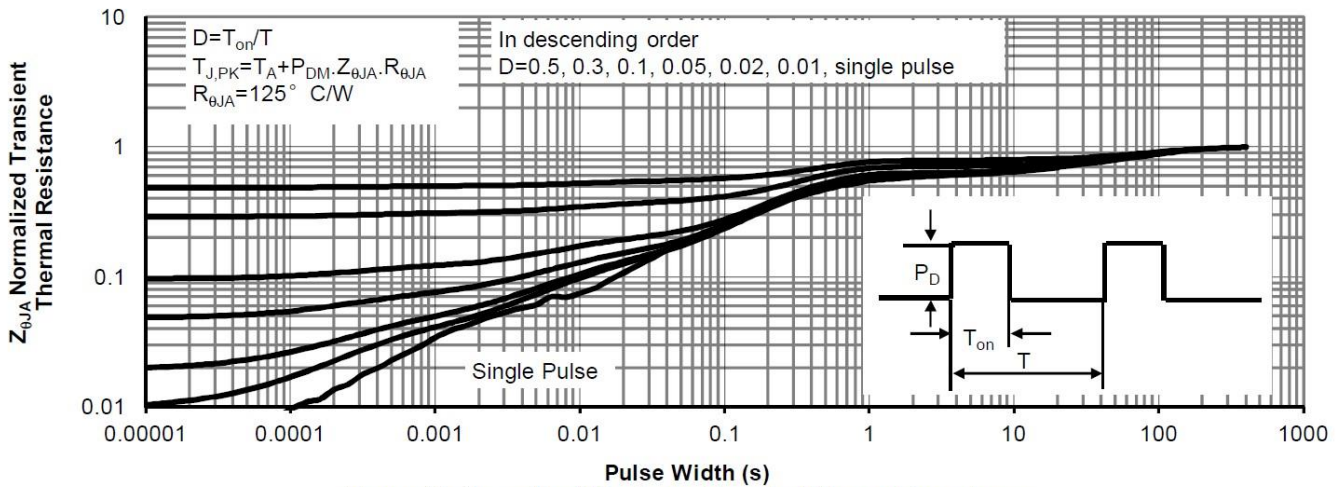
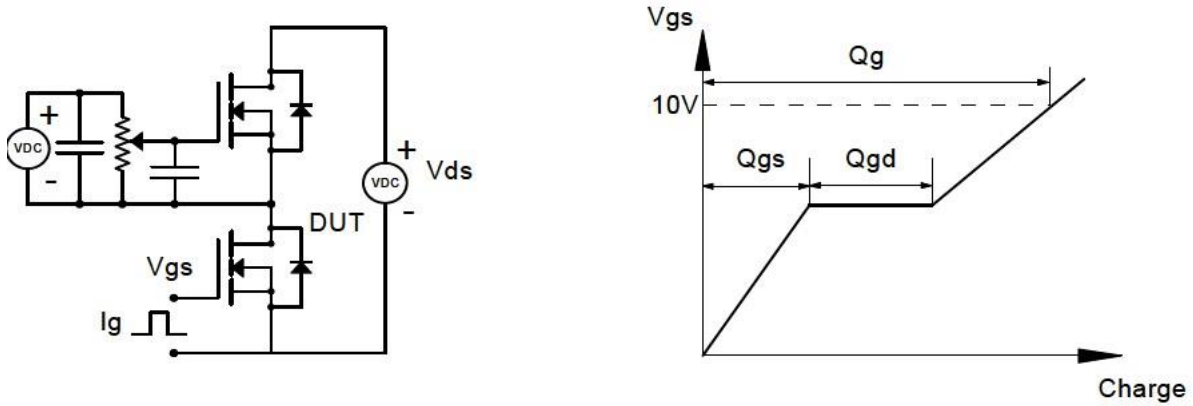


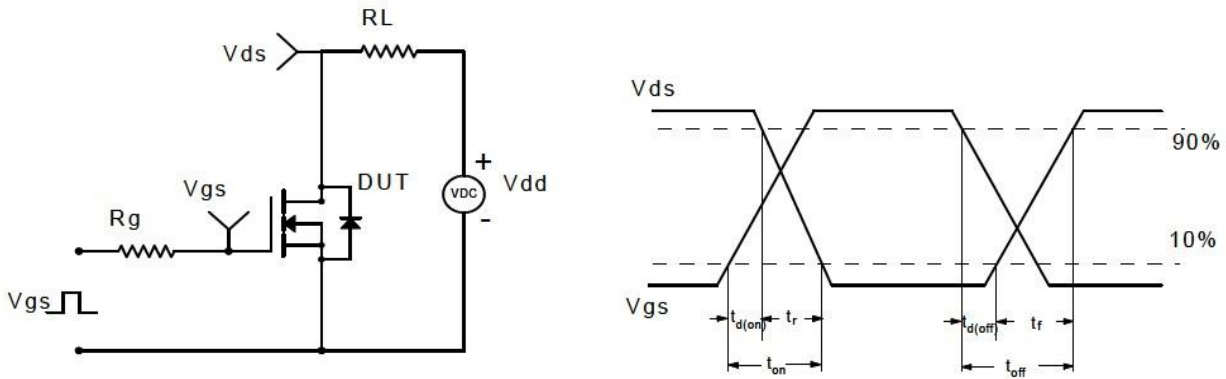
Figure 11: Normalized Maximum Transient Thermal Impedance

Gate Charge Test Circuit & Waveform

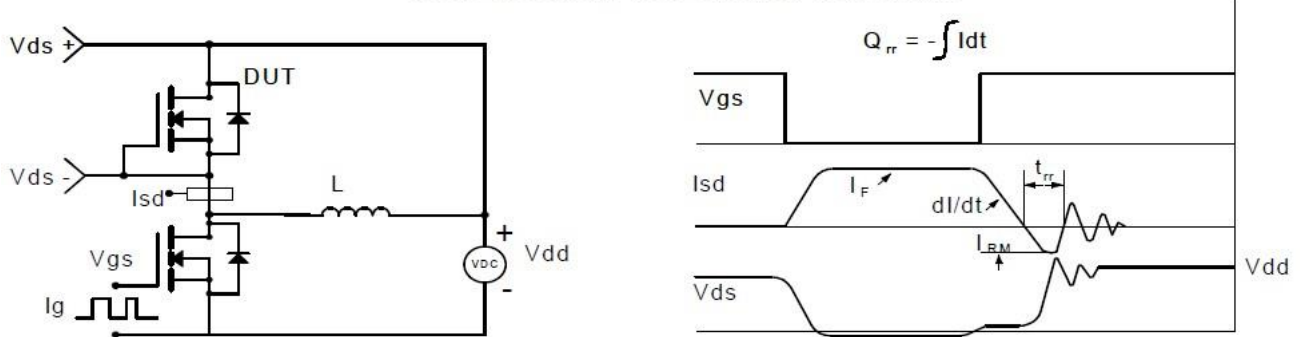


Resistive Switching Test Circuit & Waveforms

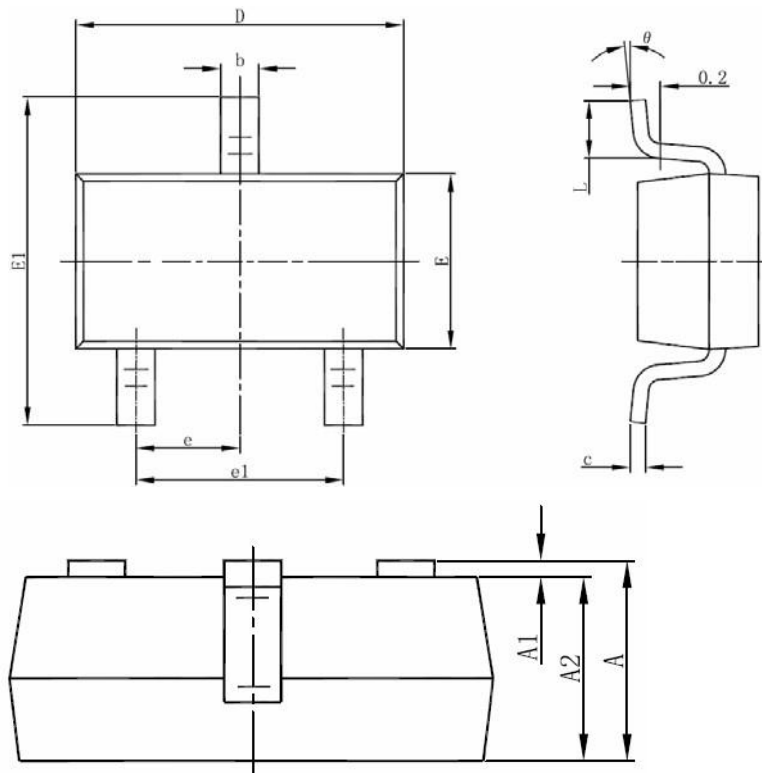
Resistive Switching Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



Package Mechanical Data



Symbol	Dimensions In Millimeters		Dimensions In 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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