ACE4410M

N-Channel 30-V MOSFET

Description

The ACE4410M utilize a high cell density trench process to provide low rDS(on) and to ensure minimal power loss and heat dissipation.

Typical applications are DC-DC converters and power management in portable and battery-powered products such as computers, printers, PCMCIA cards, cellular and cordless telephones.

Features

- Low r_{DS}(on) provides higher efficiency and extends battery life
- Low thermal impedance copper leadframe
- SOP8 saves board space
- Fast switching speed
- High performance trench technology

Absolute Maximum Ratings

Parameter		Symbol	Limit	Units
Drain-Source Voltage		V_{DS}	30	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current [a]	T_A=25°C	I_D	13	A
	T_A=70°C		11	
Pulse Drain Current [b]		I_{DM}	50	
Continuous Drain Current (Diode Continuous) [a]		I_s	2.3	A
Power Dissipation [a]	T_A=25°C	P_D	3.1	W
	T_A=70°C		2.2	
Operating Junction and Storage Temperature Range		T_J,T_{STG}	-55 to 150	°C

Parameter		Symbol	Maximum	Units
Maximum Junction-to-Case [a]	t≦5sec	$R_{\theta JC}$	25	℃/W
Maximum Junction-to-Ambient [a]	t≦5sec	$R_{\theta JA}$	50	℃/W

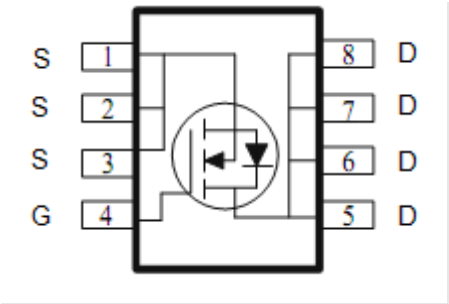
Notes

a. Surface Mounted on 1” x 1” FR4 Board.

b. Pulse width limited by maximum junction temperature

Packaging Type

SOP8



Ordering information

ACE4410M FM + H

- H — Halogen - free
- + — Pb - free
- FM — FM-SOP8

Electrical Characteristics T_A=25 °C unless otherwise noted

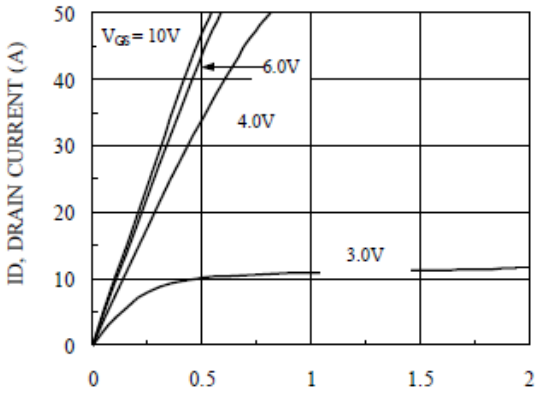
Parameter	Symbol	Conditions	Limits			Unit
			Min.	Typ.	Max.	
Static						
Gate Source Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250uA	1			V
Gate Body Leakage	I_{GSS}	V_{DS}=0V, V_{GS}=±20V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=24V, V_{GS}=0V			1	uA
		V_{DS}=24V, V_{GS}=0V, T_J=55℃			25	
On-State Drain-Current [a]	$I_{D(on)}$	V_{DS}=5V, V_{GS}=10V	20			A
Static Drain-Source On-Resistance [a]	$r_{DS(ON)}$	V_{GS}=10V,I_D=10A			13.5	mΩ
		V_{GS}=4.5V,I_D=8A			20	
Forward Transconductance [a]	g_{fS}	V_{GS}=15V,I_D=10A		40		S
Diode Forward Voltage [a]	V_{SD}	I_S=2.3A ,V_{GS}=0V		0.7		V
Dynamic [b]						
Total Gate Charge	Q_g	V_{DS}=15V, V_{GS}=4.5V, I_D=10A		12.5		nC
Gate-Source Charge	Q_{gs}			2.6		
Gate-Drain Charge	Q_{gd}			4.6		
Input Capacitance	C_{iss}	V_{DS}=15V, V_{GS}=0V f=1MHz		1191		pF
Output Capacitance	C_{oss}			412		
Reverse Transfer Capacitance	C_{rss}			160		
Turn-On Delay Time	$t_{d(on)}$	V_{DD}=25V, ,R_L=25Ω I_D=1A,V_{GEN}=10V		20		nS
Rise Time	t_f			9		
Turn-Off Delay Time	$t_{d(off)}$			70		
Fall Time	t_f			20		

Note:

a. Pulse test: PW <= 300us duty cycle <= 2%.

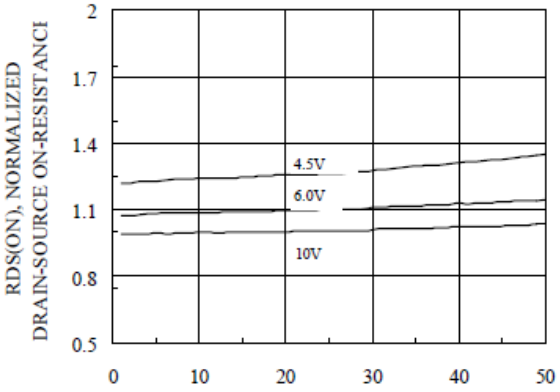
b. Guaranteed by design, not subject to production testing.

Typical Performance Characteristics



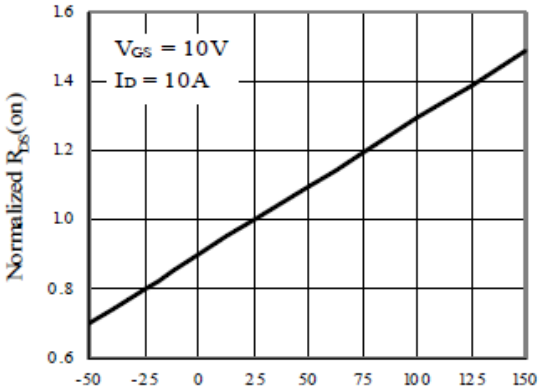
VDS, DRAIN-SOURCE VOLTAGE (V)

1. On-Region Characteristics



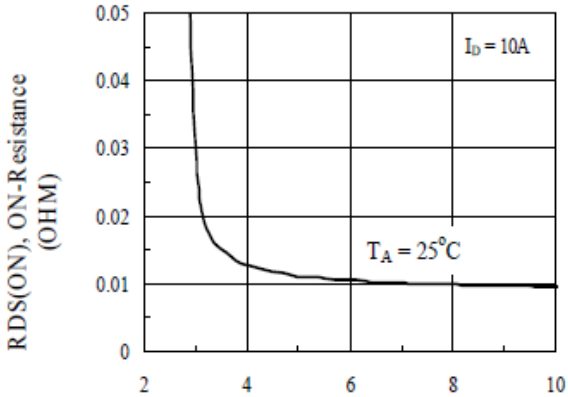
ID, DRAIN CURRENT (A)

2. On-Resistance with Drain Current



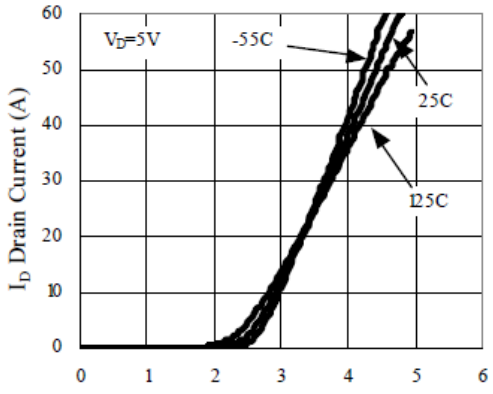
T_J Junction Temperature (C)

3. On-Resistance Variation with Temperature



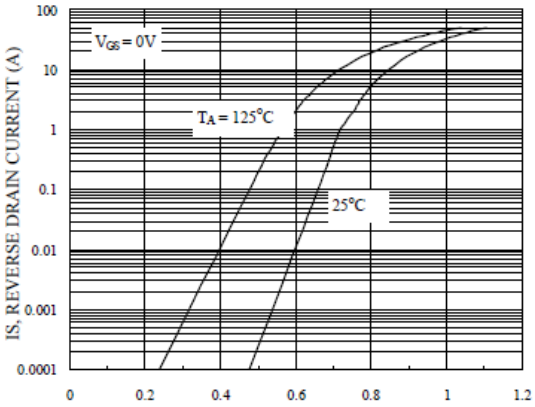
VGS, Gate To Source Voltage (V)

4.On-Resistance Variation with



VGS Gate to Source Voltage (V)

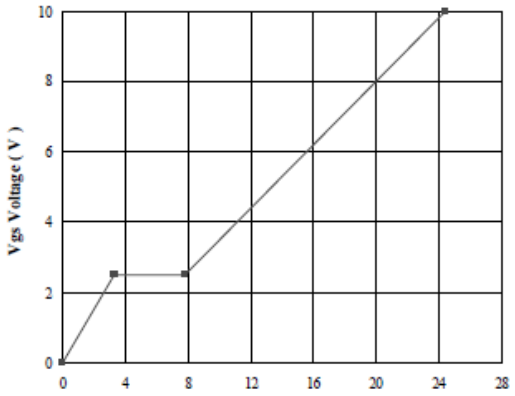
5. Transfer Characteristics



VSD, BODY DIODE FORWARD VOLTAGE (V)

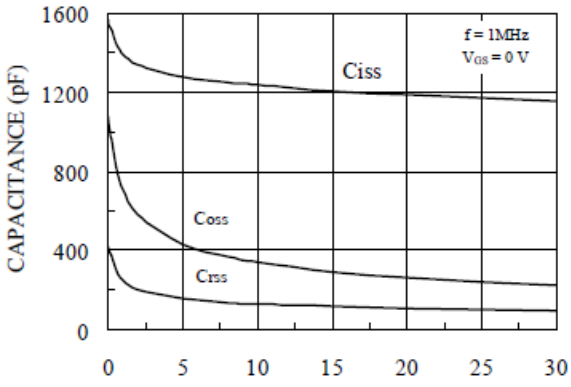
6. Body Diode Forward Voltage Variation with Source Current and Temperature

Typical Performance Characteristics



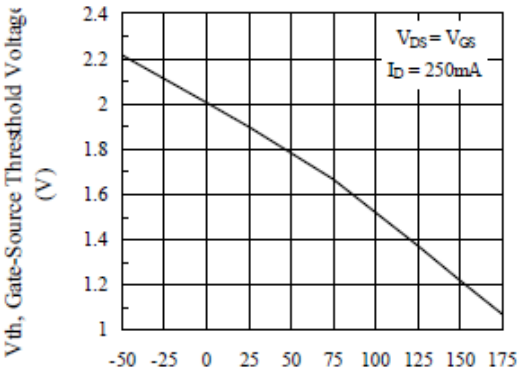
Qg - Gate Charge (nC)

7. Gate Charge Characteristics



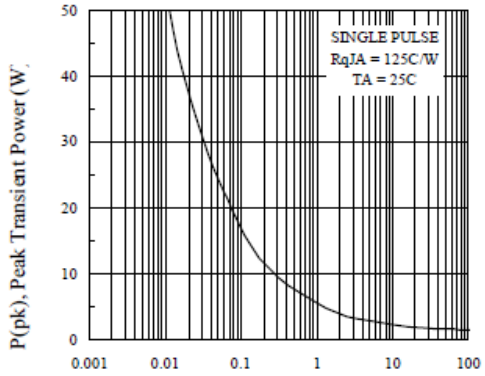
VDS, DRAIN TO SOURCE VOLTAGE(V)

8. Capacitance Characteristics



TA,AMBIENT TEMPERATURE(℃)

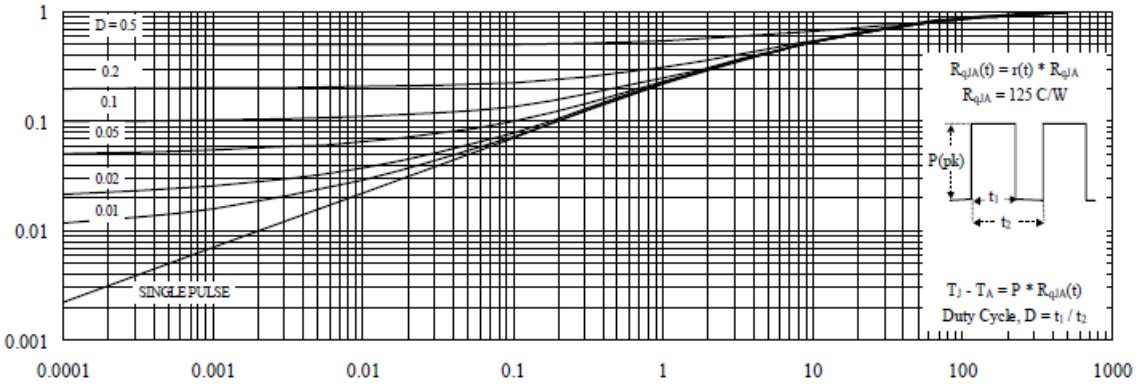
9. Threshold Vs Ambient Temperature



t1 TIME (sec)

10. Single Pulse Maximum Power Dissipation

Normalized Thermal Transient Junction to Ambient



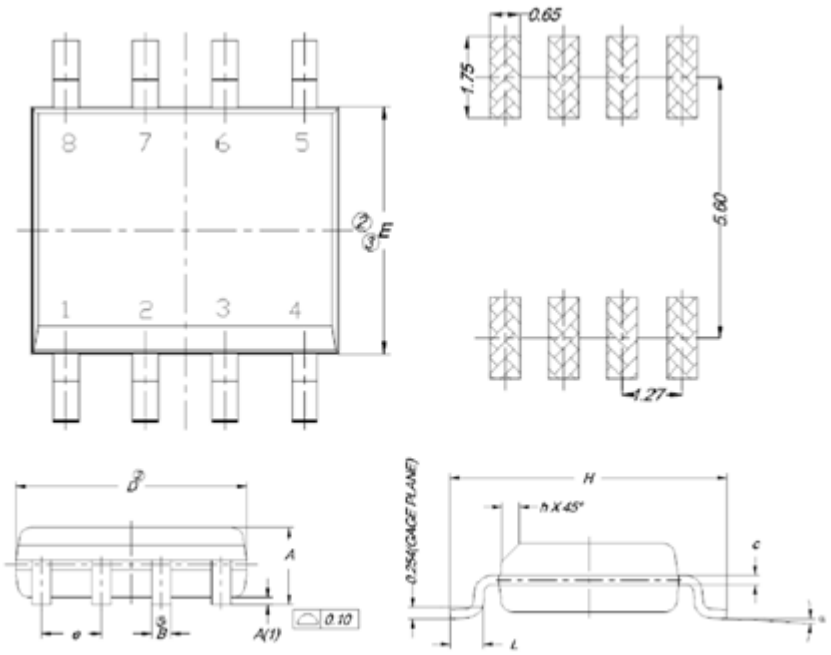
t1 TIME (sec)

Square Wave Pulse Duration (S)

11. Transient Thermal Response Curve

Packing Information

SOP8



SYMBOLS	DIMENSIONS IN MILLIMETERS		DIENSIONS IN INCHES	
	MIN	MAX	MIN	MAX
A	1.35	1.75	0.053	0.069
A1	0.10	0.20	0.004	0.008
B	0.35	0.51	0.014	0.020
C	0.19	0.25	0.0075	0.010
D	4.80	5.00	0.189	0.196
E	3.80	4.00	0.150	0.157
e	1.27 BSC		0.050 BSC	
H	5.80	6.20.	0.228	0.244
h	0.25	0.50	0.010	0.020
L	0.50	0.93	0.020	0.037
q	0°	8°	0°	8°

Notes

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2. A critical component is any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.

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