ACE7331M

P-Channel 30-V MOSFET

Description

The ACE7331M utilize a high cell density trench process to provide low r_{DS}(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 lead frame DFN3x3-8L 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℃	I_D	-13.4	A
	T_A=70℃		-11.0	
Pulsed Drain Current [b]		I_{DM}	±50	A
Continuous Source Current (Diode Conduction) [a]		I_S	-2.1	A
Power Dissipation [a]	T_A=25℃	P_D	3.5	W
	T_A=70℃		2.0	
Operating temperature / storage temperature		T_J/T_{STG}	-55~150	℃

THERMAL RESISTANCE RATINGS				
Parameter		Symbol	Maximum	Units
Maximum Junction-to-Ambient [a]	t <= 10 sec	$R_{\theta JA}$	35	°C/W
	Steady State		81	

Notes

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

b. Pulse width limited by maximum junction temperature

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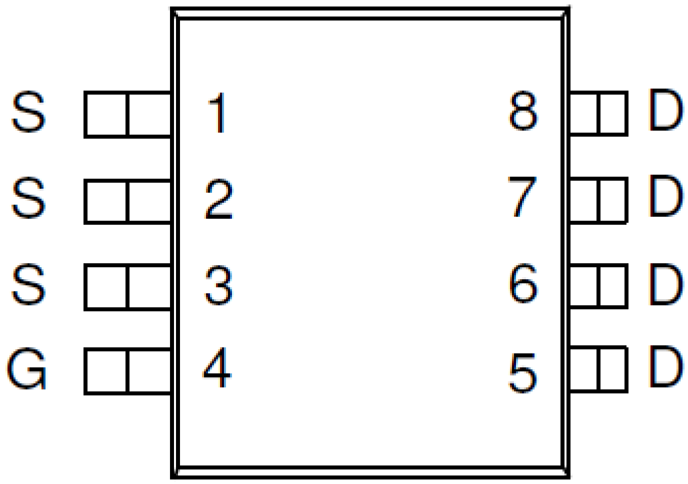
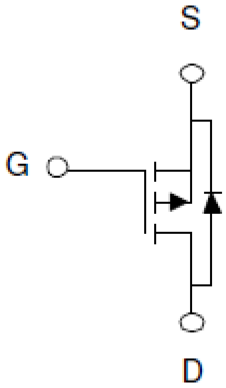
Packaging Type
DFN3*3-8L





P-Channel MOSFET

Ordering information

ACE7331M NN + H

- Halogen - free
- Pb - free
- NN : DFN3*3-8L

Electrical Characteristics

T_A=25℃, unless otherwise specified.

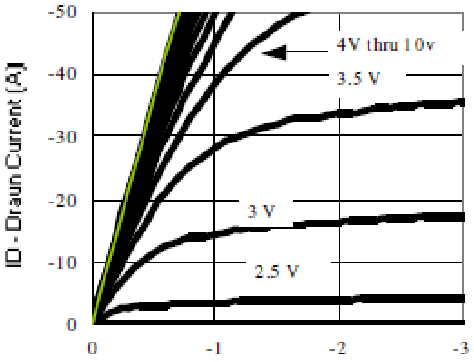
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Static						
Gate-Source Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}$, I_D = -250 uA	-1			V
Gate-Body Leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ±25 V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = -24 V, V_{GS} = 0 V			-1	uA
		V_{DS} = -24 V, V_{GS} = 0 V, T_J = 55℃			-5	
On-State Drain Current[A]	$I_{D(on)}$	V_{DS} = -5 V, V_{GS} = -10 V	-50			A
Drain-Source On-Resistance[A]	$R_{DS(ON)}$	V_{GS} = -10 V, I_D = -11.5 A			19	mΩ
		V_{GS} = -4.5 V, I_D =-9.3 A			30	
Forward Transconductance[A]	g_{FS}	V_{DS} =-15 V, I_D = -11.5 A		29		S
Diode Forward Voltage	V_{SD}	I_S = 2.5 A, V_{GS} = 0 V		-0.8		V
Dynamic [b]						
Total Gate Charge	Q_g	V_{DS} = -15 V, V_{GS} = -5 V, I_D =- 11.5 A		25		nC
Gate-Source Charge	Q_{gs}			11		
Gate-Drain Charge	Q_{gd}			17		
Turn-On Delay Time	$t_{d(on)}$	V_{DS} = -15 V, R_L = 6 Ω, I_D = -1 A, V_{GEN} = -10 V		15		ns
Rise Time	t_r			13		
Turn-Off Delay Time	$t_{d(off)}$			100		
Fall Time	t_f			54		

Note :

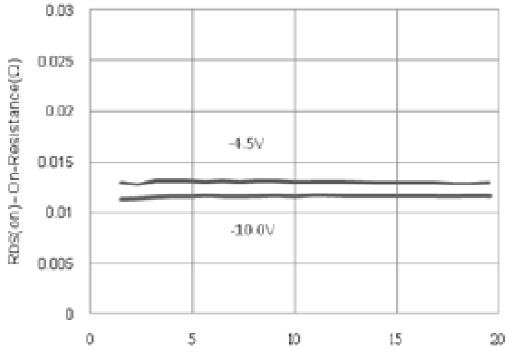
a. Pulse test: PW <= 300us duty cycle <= 2%.

b. Guaranteed by design, not subject to production testing

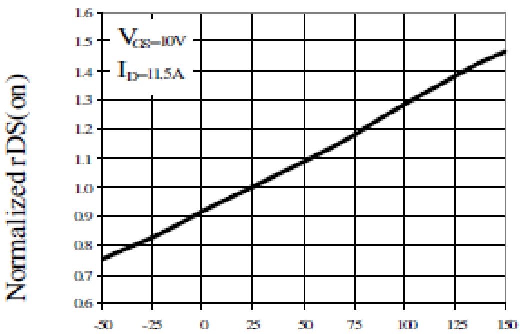
Typical Performance Characteristics



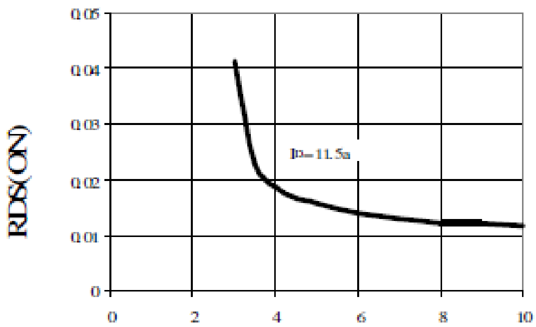
VDS - Gate-to-Source Voltage (V)
1.On-Resistance Characteristics



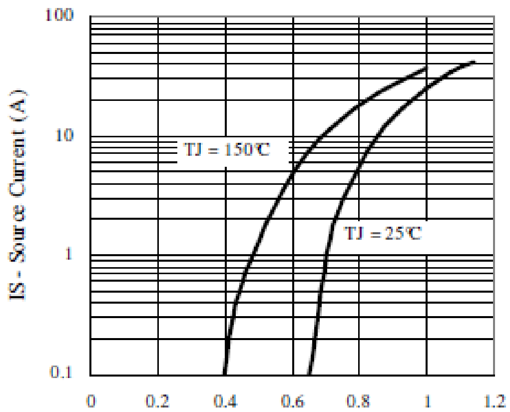
ID-Drain Current (A)ace
2. On-Resistance Variation with
Drain Current and Gate Voltage



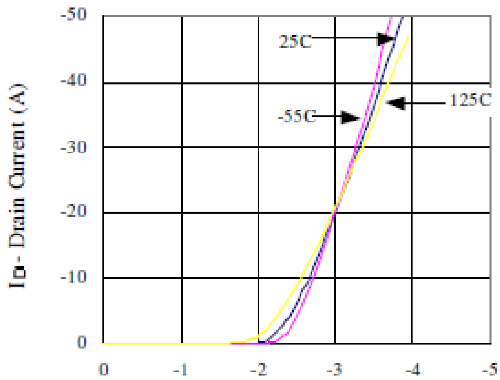
TJ –Junction Temperature(°C)
3. On-Resistance vs. Variation with Temperature



VGS - Gate-to-Source Voltage (V)
4. On-Resistance vs with Gate to Source Voltage

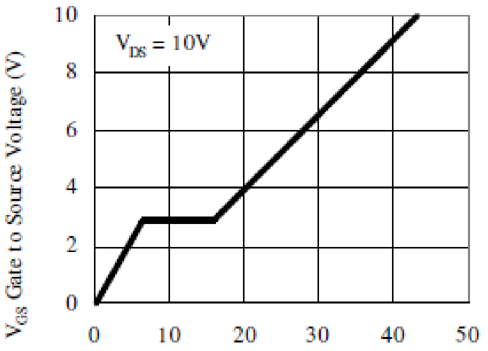


VDS - Source to Drain Current (V)
5. Transfer Characteristics



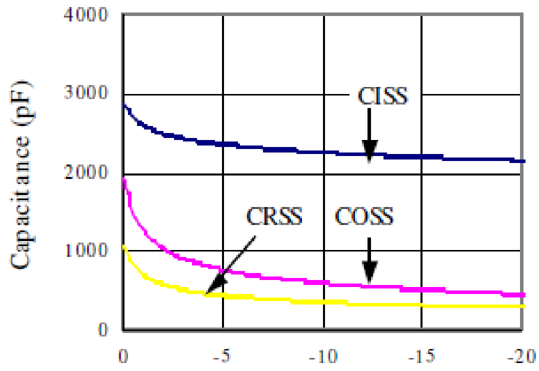
VGS- Gate to Source Voltage (V)
6.Body Diode Forward Voltage Variation with
source Current and Temperature

Typical Performance Characteristics



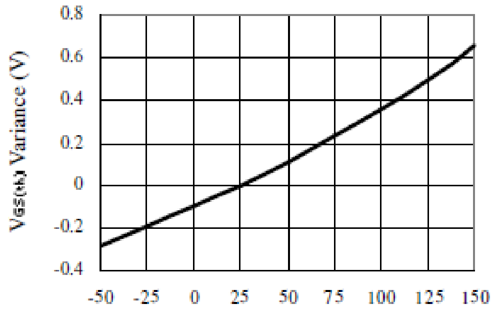
Qg - Total Gate Charge (nC)

7. Gate Charge Characteristics



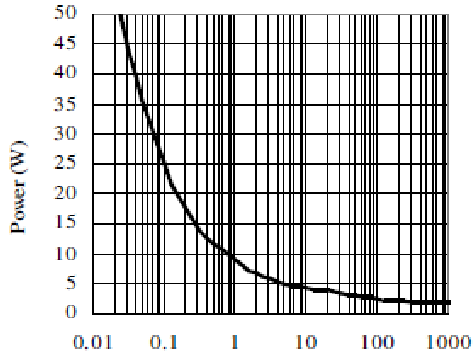
V_{DS} (V)

8. Capacitance Characteristics



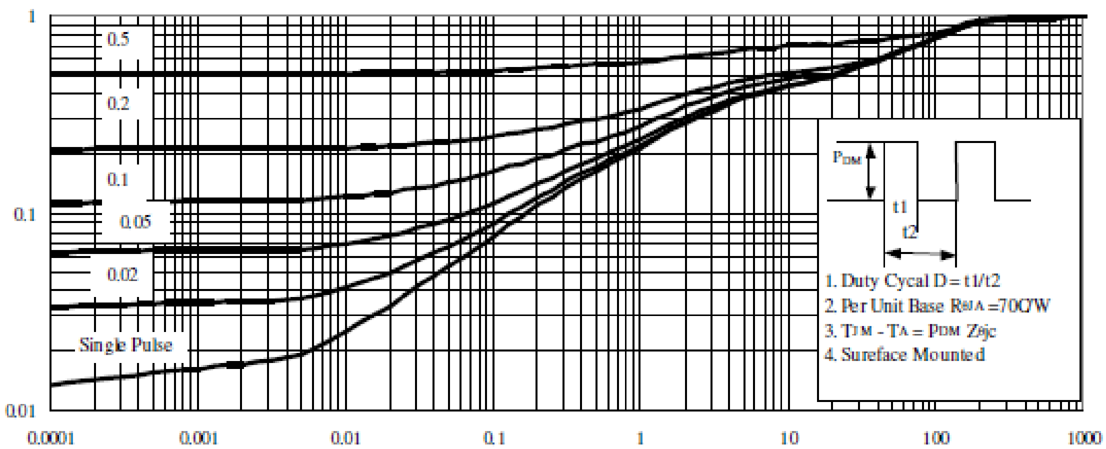
TJ –Junction Temperature (°C)

9. Maximum Safe Operating Area



Pulse TIME (S)

10.Single Pulse Maximum Power Dissipation



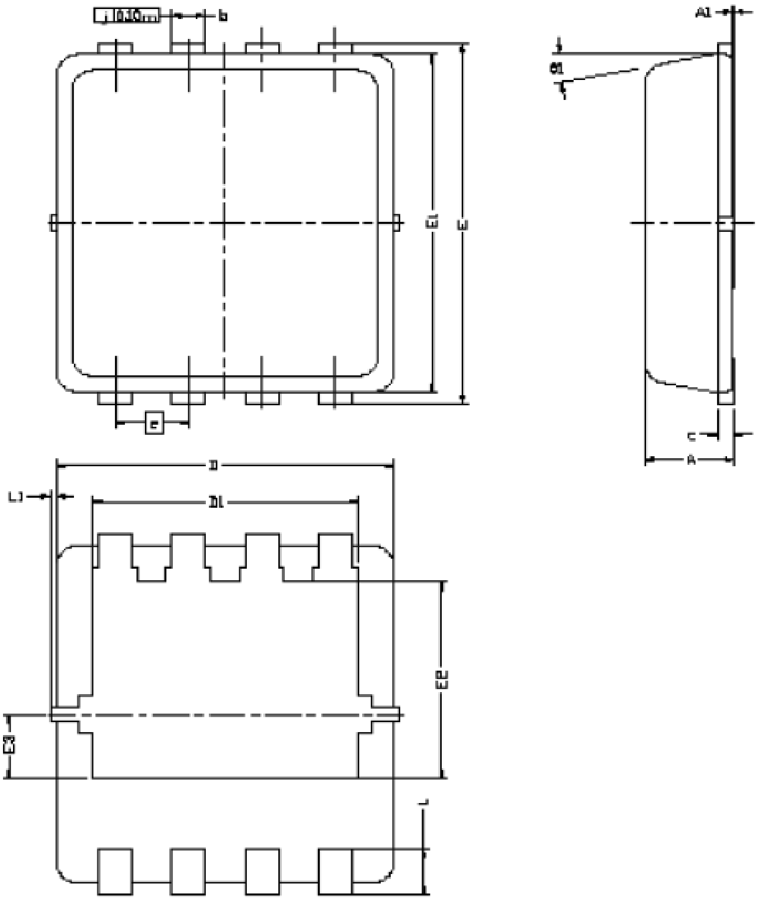
Normalized Thermal Transient Junction to Ambient

Square Wave Pulse Duration (s)

11. Transient Thermal Response Curve

Packing Information

DFN3*3-8L



SYMBOLS	DIMENSIONS IN MILLIMETERS			DIENSIONS IN INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.700	0.80	0.900	0.0276	0.0315	0.0354
A1	0.00		0.05	0.000		0.002
b	0.24	0.30	0.35	0.009	0.012	0.014
c	0.10	0.152	0.25	0.004	0.006	0.010
D	3.00BSC			0.118BSC		
D1	2.35BSC			0.093BSC		
E	3.20BSC			0.126BSC		
E1	3.00BSC			0.118BSC		
E2	1.75BSC			0.069BSC		
E3	0.575BSC			0.023BSC		
e	0.65BSC			0.026BSC		
L	0.30	0.40	0.50	0.0118	0.0157	0.0197
L1	0		0.100	0		0.004
Θ1	0°	10°	12°	0°	10°	12°

Unit: mm

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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