ACE9006M

N-Channel 60-V (D-S) MOSFET

Description

ACE9006M uses advanced trench technology to provide excellent $R_{DS(ON)}$.

This device particularly suits for low voltage application such as power management of desktop computer or notebook computer power management, DC/DC converter.

Features

- Low $r_{DS(on)}$ trench technology
- Low thermal impedance
- Fast switching speed

Applications:

- White LED boost converters
- Automotive Systems
- Industrial DC/DC Conversion Circuits

Absolute Maximum Ratings

(TA = 25°C UNLESS OTHERWISE NOTED)

Parameter		Symbol	Limit	Unit
Drain-Source Voltage		V_{DS}	60	V
Gate-Source Voltage		V_{GS}	±20	
Continuous Drain Current [a]	T_C=25°C	I_D	90	A
Pulsed Drain Current [b]		I_{DM}	240	
Continuous Source Current (Diode Conduction) [a]		I_S	90	A
Power Dissipation [a]	T_C=25°C	P_D	300	W
Operating Junction and Storage Temperature Range		T_J, T_{stg}	-55 to 175	°C

THERMAL RESISTANCE RATINGS

Parameter	Symbol	Maximum	Unit
Maximum Junction-to-Ambient	$R_{\theta JA}$	62.5	°C/W
Maximum Junction-to-Case	$R_{\theta JC}$	0.5	

Notes

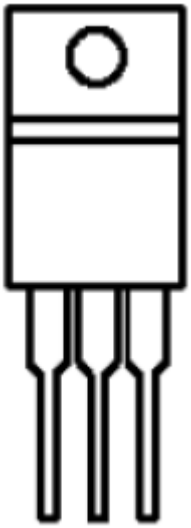
a. Surface Mounted on 1” x 1” FR4 Board.

b. Pulse width limited by maximum junction temperature

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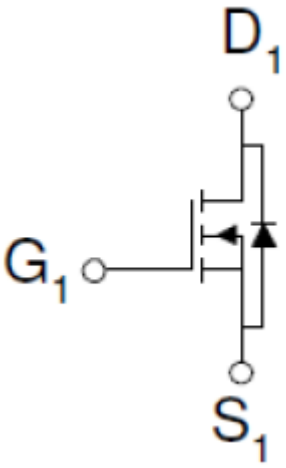
Packaging Type

TO-220AB



DRAIN connected to TAB

G D S



N-Channel MOSFET

Ordering information

ACE9006M XX + H

- H: Halogen - free
- XX: Pb - free
- ZM:TO-220

Electrical Characteristics

T_A=25°C, unless otherwise specified.

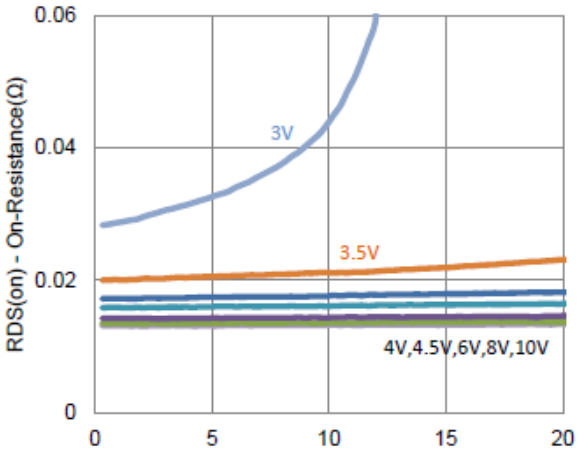
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Static						
Gate-Source Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250 uA	1			V
Gate-Body Leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ±20 V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 48 V, V_{GS} = 0 V			1	uA
		V_{DS} = 48 V, V_{GS} = 0 V, T_J = 55°C			25	
On-State Drain Current [a]	$I_{D(on)}$	V_{DS} = 5 V, V_{GS} = 10 V	120			A
Drain-Source On-Resistance [a]	$r_{DS(on)}$	V_{GS} = 10 V, I_D = 45 A			16.5	mΩ
		V_{GS} = 4.5 V, I_D = 44 A			21	
Forward Transconductance [a]	g_{fs}	V_{DS} = 15 V, I_D = 20 A		30		S
Diode Forward Voltage [a]	V_{SD}	I_S = 55A, V_{GS} = 0 V		1.04		V
Dynamic [b]						
Total Gate Charge	Q_g	V_{DS} = 30 V, V_{GS} = 4.5 V, I_D = 20 A		21		nC
Gate-Source Charge	Q_{gs}			6.4		
Gate-Drain Charge	Q_{gd}			11		
Turn-On Delay Time	$t_{d(on)}$	V_{DD} = 30 V, R_L = 1.5 Ω , I_D = 20 A, V_{GEN} = 10 V, R_{GEN} = 6 Ω		13		ns
Rise Time	t_r			17		
Turn-Off Delay Time	$t_{d(off)}$			66		
Fall Time	t_f			23		
Input Capacitance	C_{iss}	V_{DS} = 15 V, V_{GS} = 0 V, f =1 MHz		2138		pF
Output Capacitance	C_{oss}			184		
ReverseTransfer Capacitance	C_{rss}			168		

Note:

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

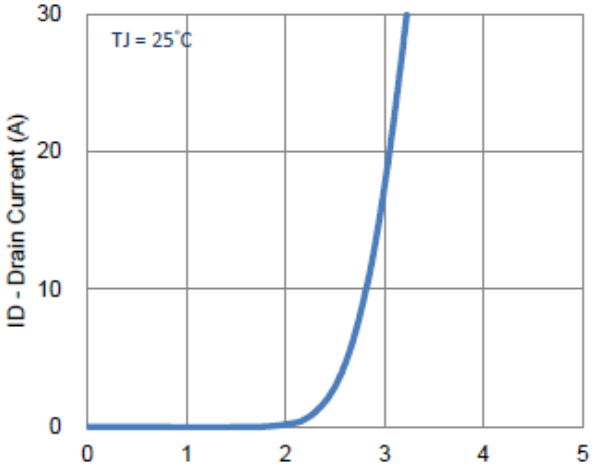
b. Guaranteed by design, not subject to production testing.

Typical Performance Characteristics (N-Channel)



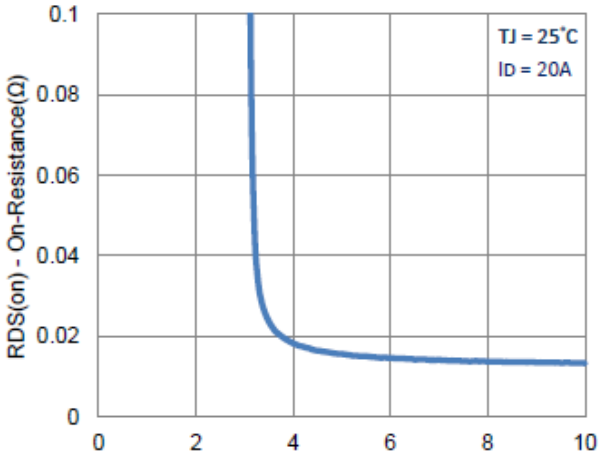
ID-Drain Current (A)

1. On-Resistance vs. Drain Current



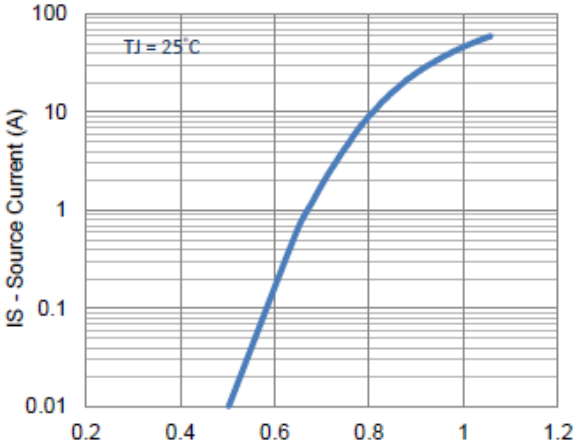
VGS - Gate-to-Source Voltage (V)

2. Transfer Characteristics



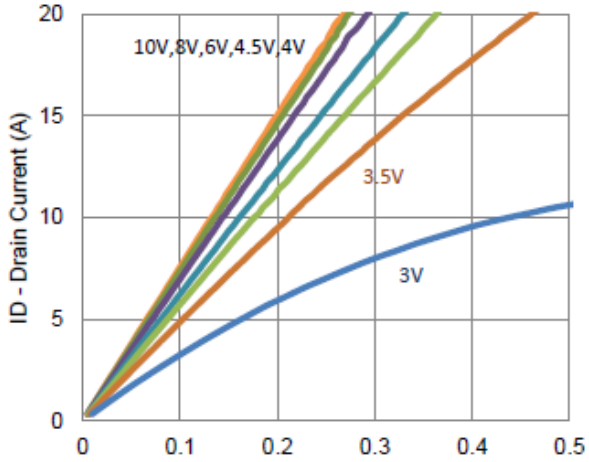
VGS - Gate-to-Source Voltage (V)

3. On-Resistance vs. Gate-to-Source Voltage



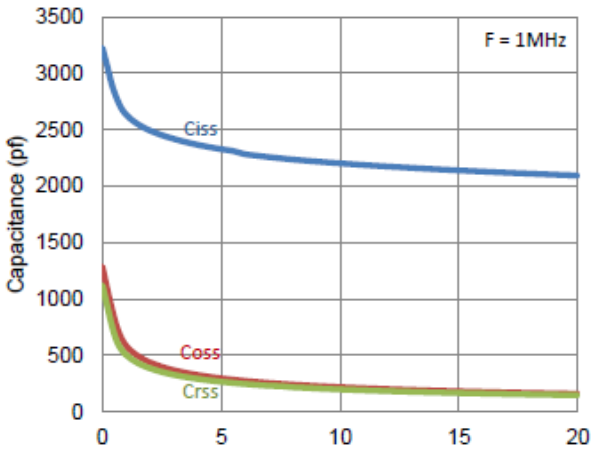
VSD - Source-to-Drain Voltage (V)

4. Drain-to-Source Forward Voltage



VDS - Drain-to-Source Voltage (V)

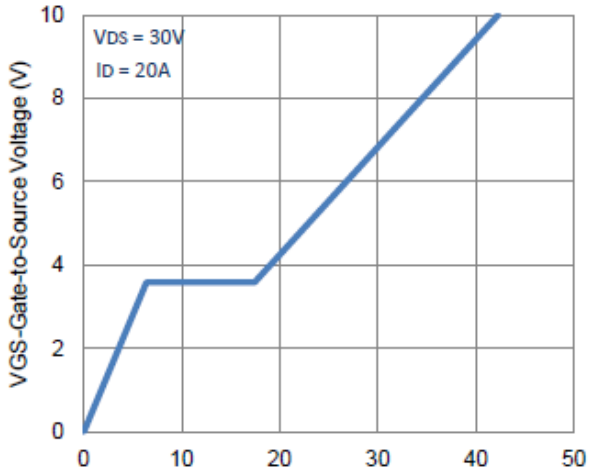
5. Output Characteristics



VDS-Drain-to-Source Voltage (V)

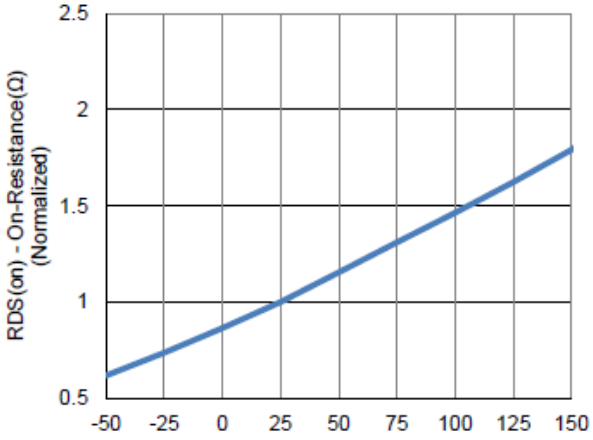
6. Capacitance

Typical Performance Characteristics



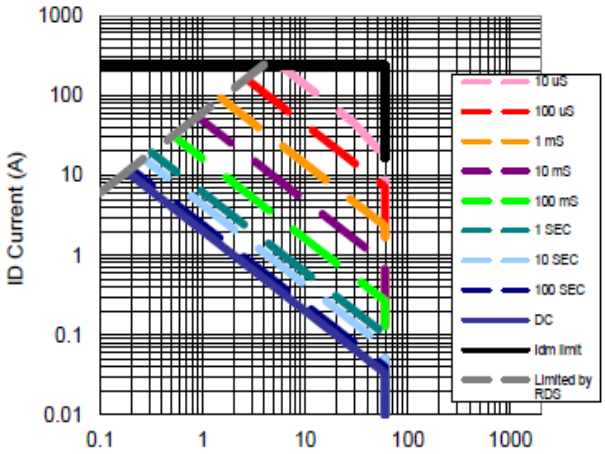
Qg - Total Gate Charge (nC)

7. Gate Charge



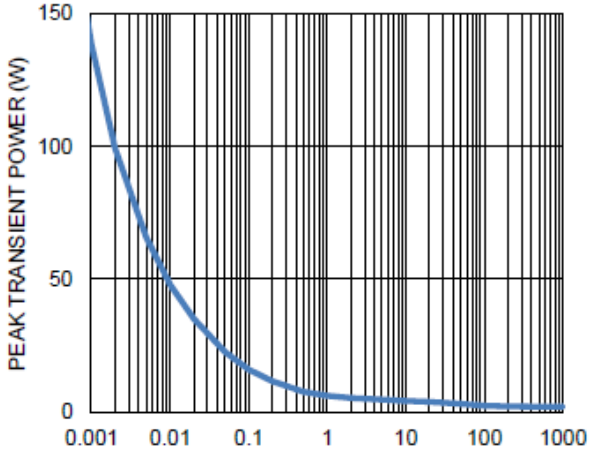
TJ –Junction Temperature(°C)

8. Normalized On-Resistance Vs Junction Temperature



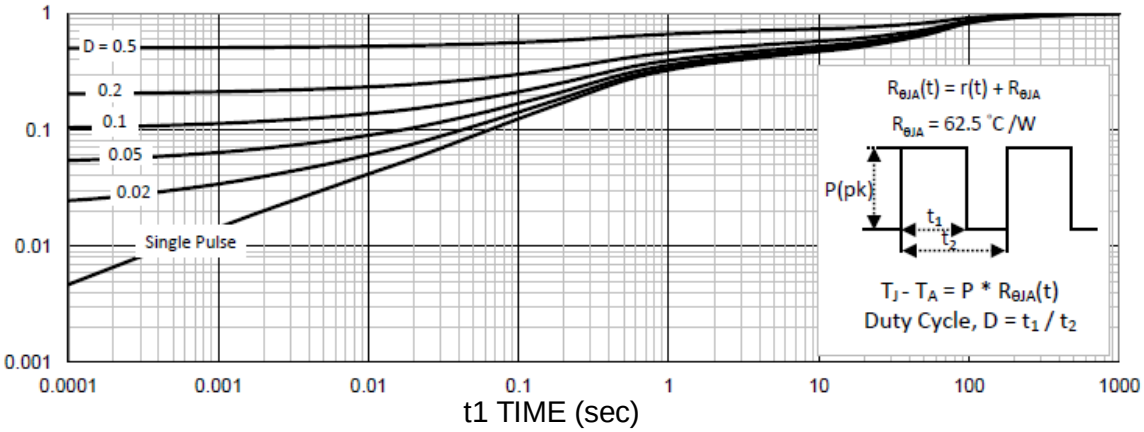
VDS Drain to Source Voltage (V)

9. Safe Operating Area



t1 TIME (SEC)

10. Single Pulse Maximum Power Dissipation

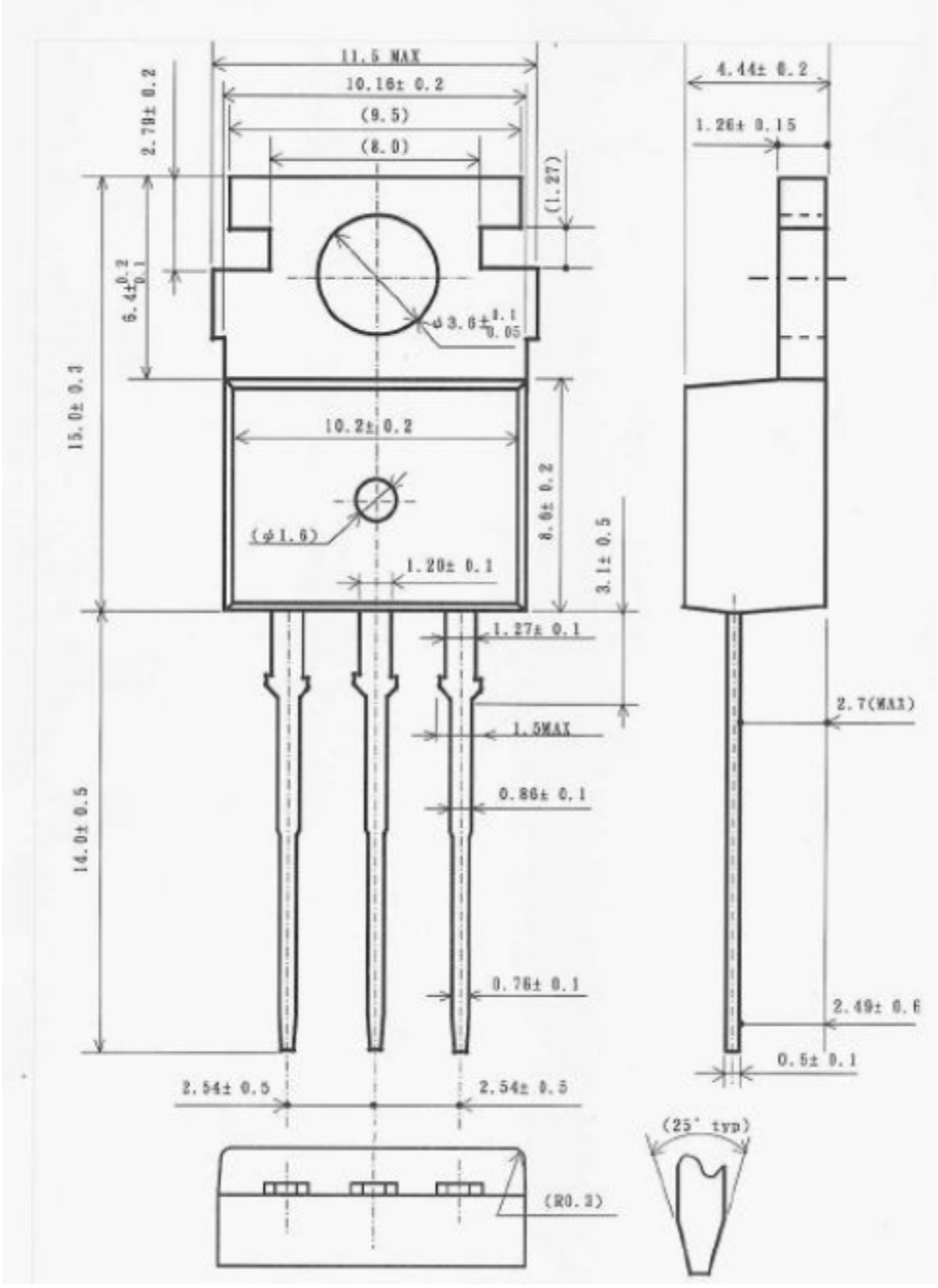


t1 TIME (sec)

11. Normalized Thermal Transient Junction to Ambient

Packing Information

TO-220AB



Notes

ACE does not assume any responsibility for use as critical components in life support devices or systems without the express written approval of the president and general counsel of ACE Electronics Co., LTD. As sued herein:

1. Life support devices or systems are devices or systems which, (a) are intended for surgical implant into the body, or (b) support or sustain life, and shoes failure to perform when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in a significant injury to the user.
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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