



ACE1106M

N-Channel 60-V MOSFET

Description

ACE1106M 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

($T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	60	V
Gate-Source Voltage	V_{GS}	± 20	
Continuous Drain Current ^a	I_D	110	A
$T_A=25^\circ\text{C}$			
Pulsed Drain Current ^b	I_{DM}	390	
Continuous Source Current (Diode Conduction) ^a	I_S	110	A
Power Dissipation ^a	P_D	300	W
$T_A=25^\circ\text{C}$			
Operating Junction and Storage Temperature Range	T_J, T_{stg}	-55 to 150	$^\circ\text{C}$

THERMAL RESISTANCE RATINGS

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

Notes

- Surface Mounted on 1" x 1" FR4 Board.
- Pulse width limited by maximum junction temperature

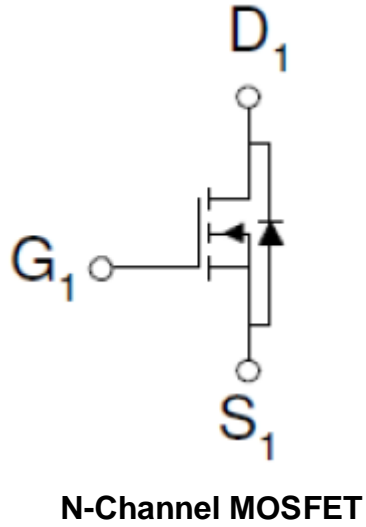
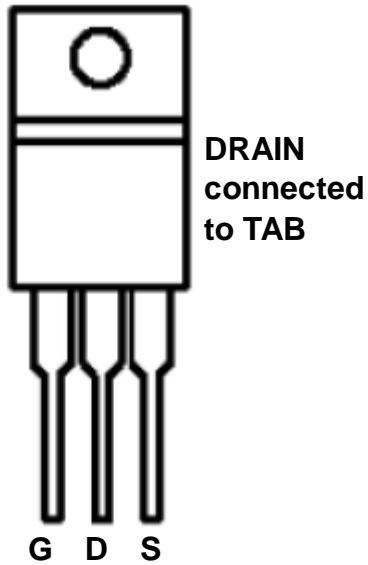


ACE1106M

N-Channel 60-V MOSFET

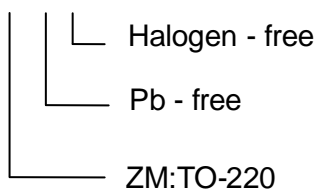
Packaging Type

TO-220



Ordering information

ACE1106M ZM + H





ACE1106M

N-Channel 60-V MOSFET

Electrical Characteristics

$T_A=25^{\circ}\text{C}$, unless otherwise specified.

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Static						
Gate-Source Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250 \mu\text{A}$	1			V
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0 \text{ V}, V_{GS} = \pm 20 \text{ V}$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 48 \text{ V}, V_{GS} = 0 \text{ V}$			1	uA
		$V_{DS} = 48 \text{ V}, V_{GS} = 0 \text{ V}, T_J = 55^{\circ}\text{C}$			25	
On-State Drain Current ^a	$I_{D(on)}$	$V_{DS} = 5 \text{ V}, V_{GS} = 10 \text{ V}$	110			A
Drain-Source On-Resistance ^a	$r_{DS(on)}$	$V_{GS} = 10 \text{ V}, I_D = 30\text{A}$			8	mΩ
		$V_{GS} = 4.5 \text{ V}, I_D = 20\text{A}$			13	
Forward Transconductance ^a	g_{fs}	$V_{DS} = 15 \text{ V}, I_D = 20 \text{ A}$		40		S
Diode Forward Voltage ^a	V_{SD}	$I_S = 55\text{A}, V_{GS} = 0 \text{ V}$		1.1		V
Dynamic ^b						
Total Gate Charge	Q_g	$V_{DS} = 30 \text{ V}, V_{GS} = 4.5 \text{ V}, I_D = 20 \text{ A}$		64		nC
Gate-Source Charge	Q_{gs}			28		
Gate-Drain Charge	Q_{gd}			36		
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = 30 \text{ V}, R_L = 1.5 \Omega, I_D = 20 \text{ A},$ $V_{GEN} = 10 \text{ V}, R_{GEN} = 6 \Omega$		35		ns
Rise Time	t_r			60		
Turn-Off Delay Time	$t_{d(off)}$			174		
Fall Time	t_f			52		
Input Capacitance	C_{iss}	$V_{DS} = 15 \text{ V}, V_{GS} = 0 \text{ V}, f = 1 \text{ MHz}$		9289		pF
Output Capacitance	C_{oss}			572		
Reverse Transfer Capacitance	C_{rss}			555		

Note:

a. Pulse test: PW \leq 300us duty cycle \leq 2%.

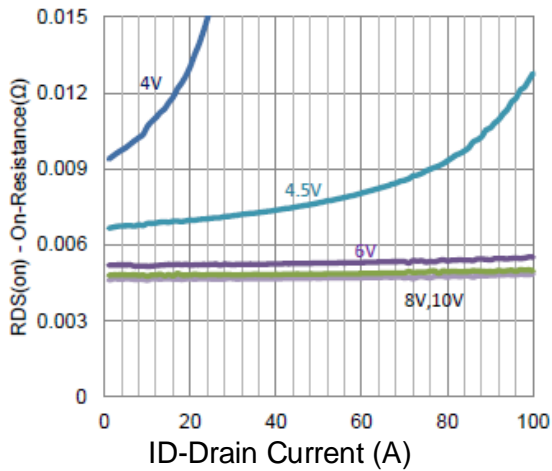
b. Guaranteed by design, not subject to production testing.



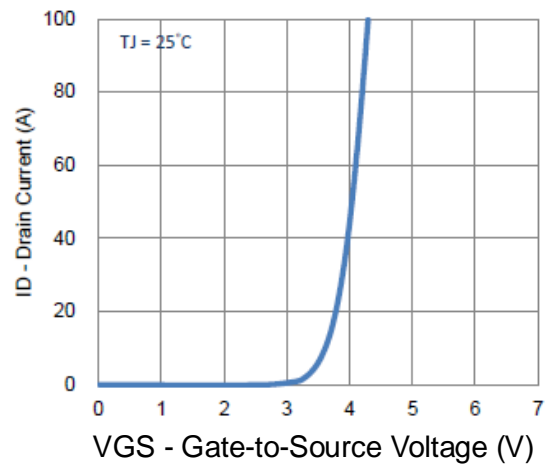
ACE1106M

N-Channel 60-V MOSFET

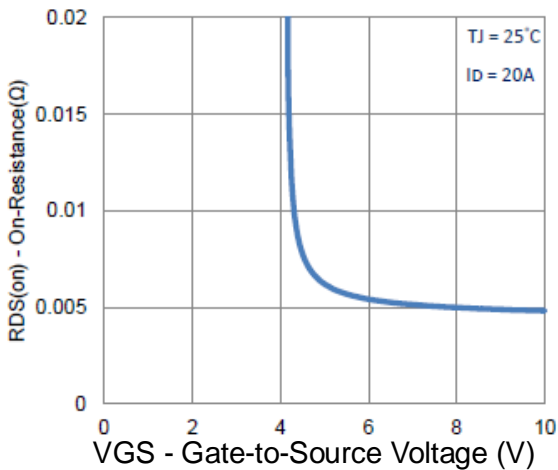
Typical Performance Characteristics (N-Channel)



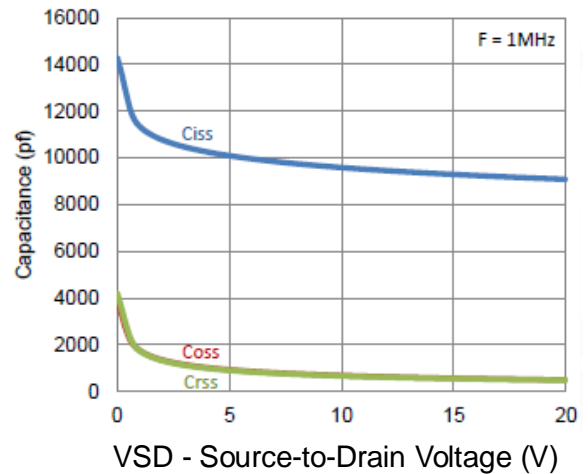
1. On-Resistance vs. Drain Current



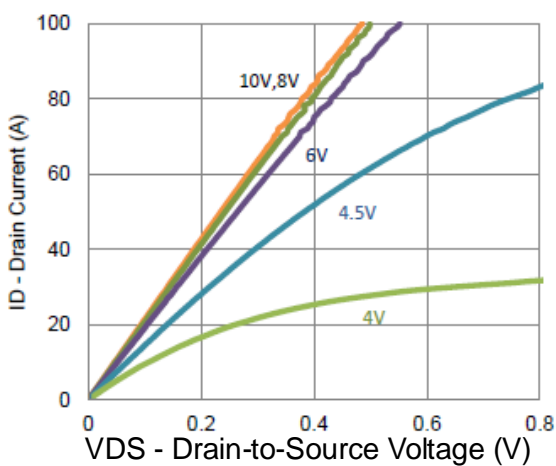
2. Transfer Characteristics



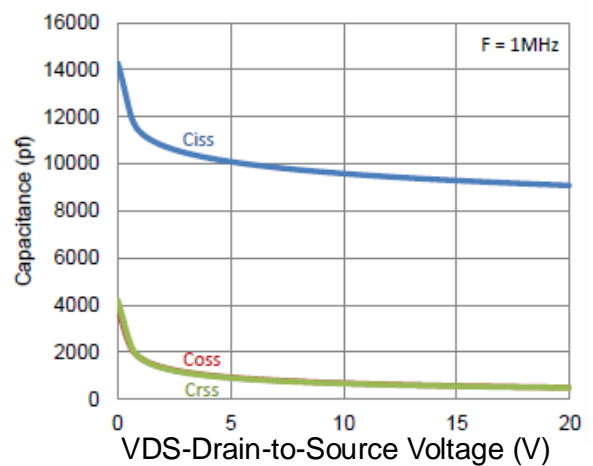
3. On-Resistance vs. Gate-to-Source Voltage



4. Drain-to-Source Forward Voltage



5. Output Characteristics

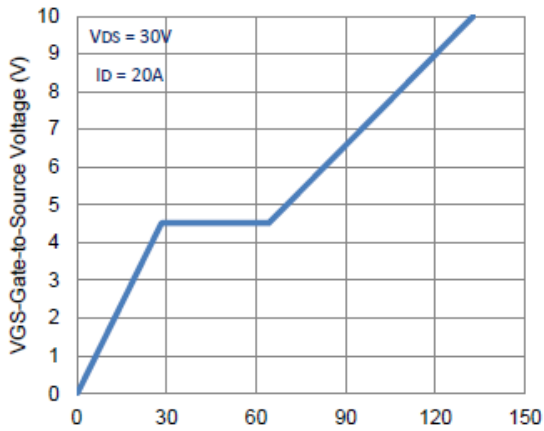


6. Capacitance

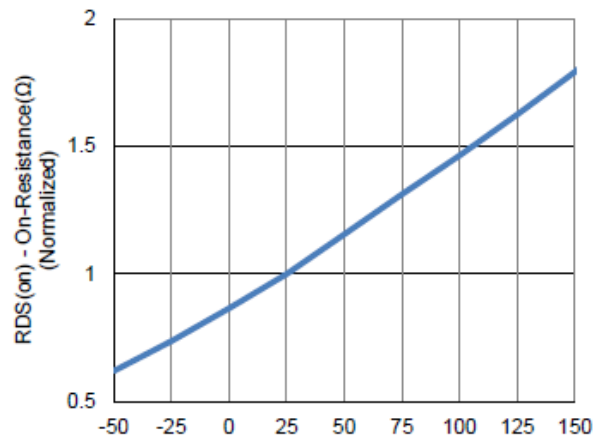


ACE1106M N-Channel 60-V MOSFET

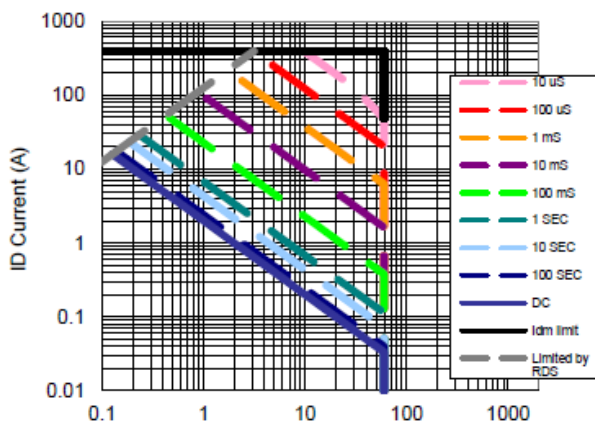
Typical Performance Characteristics



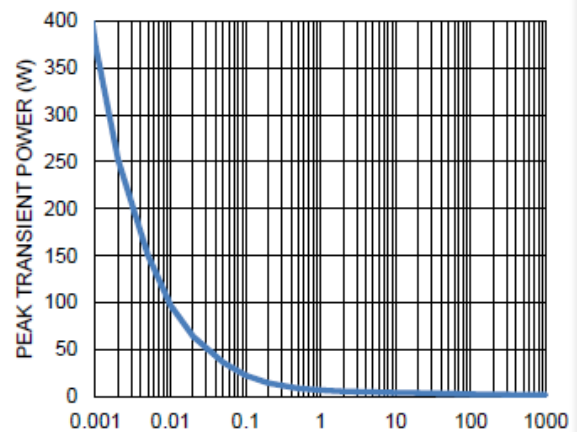
Qg - Total Gate Charge (nC)
7. Gate Charge



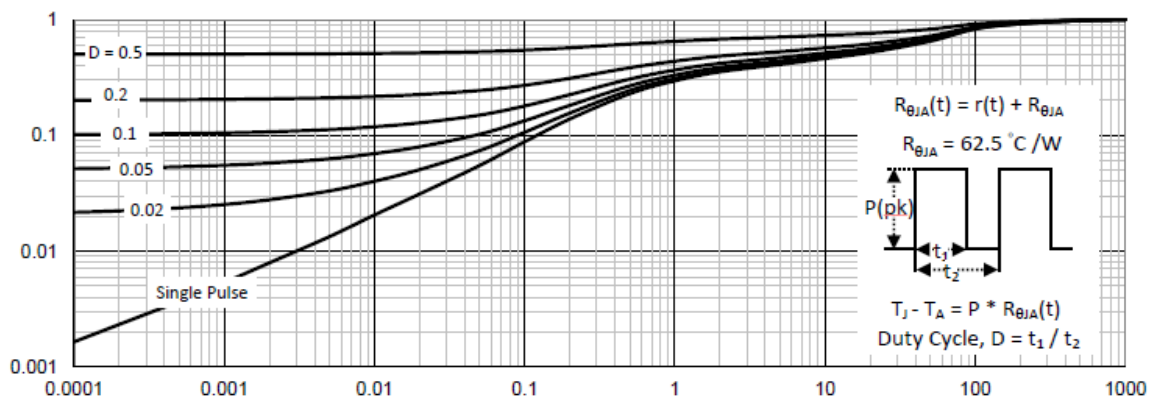
TJ - Junction Temperature (°C)
8. Normalized On-Resistance Vs Junction Temperature



VDS Drain to Source Voltage (V)
9. Safe Operating Area



10. Single Pulse Maximum Power Dissipation



t1 TIME (sec)
11. Normalized Thermal Transient Junction to Ambient

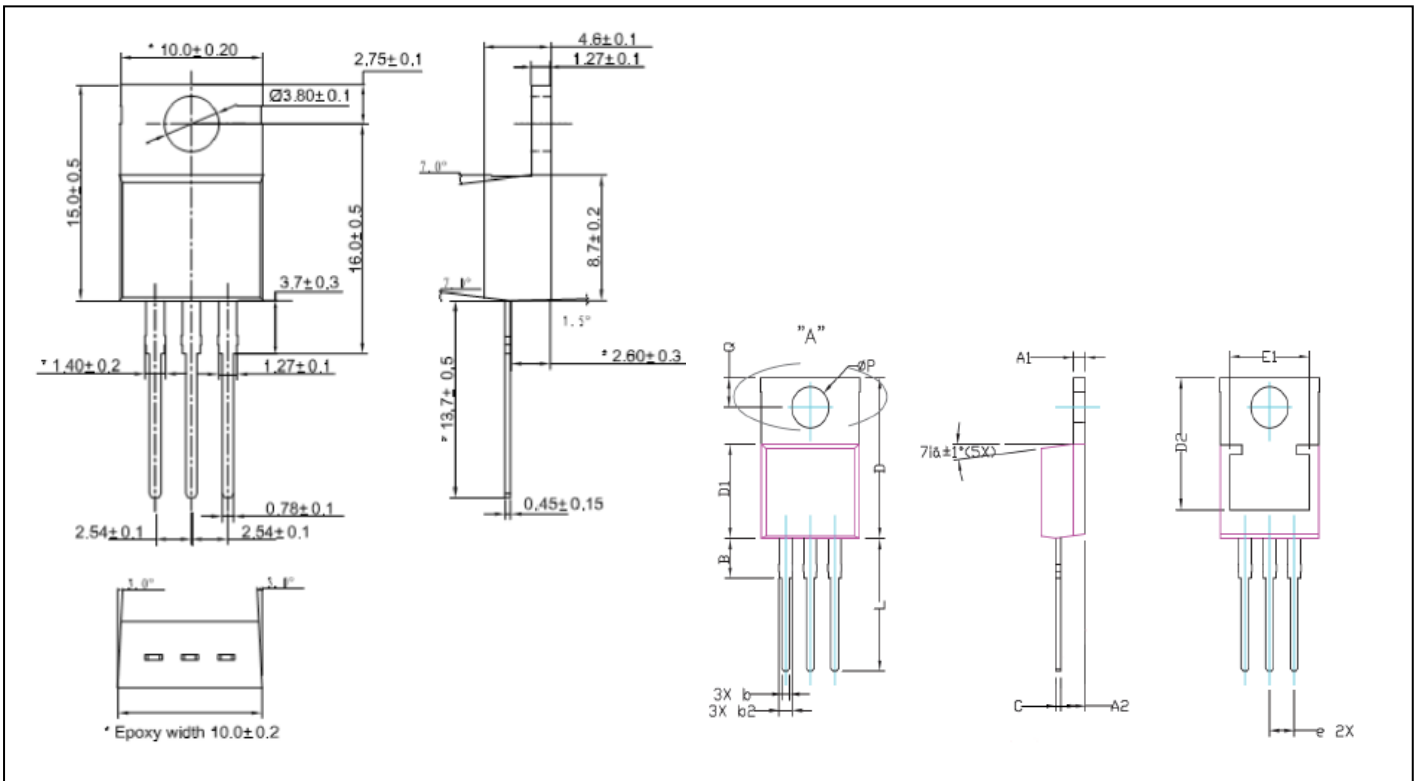


ACE1106M

N-Channel 60-V MOSFET

Packing Information

TO-220



SYMBOL	DIMENSIONAL REQMTS			INCHES REQMTS		
	MIN	NOM	MAX	MIN	NOM	MAX
E	9.70	10.15	10.54	0.382	0.400	0.415
E1	8.00	8.20	8.40	0.315	0.323	0.331
D	14.50	14.96	15.74	0.571	0.589	0.620
D1	8.64	8.78	9.65	0.340	0.346	0.380
D2	12.08	12.28	12.48	0.476	0.483	0.491
L	12.27	12.40	13.48	0.483	0.488	0.531
B	3.55	3.72	3.90	0.140	0.146	0.154
b	0.69	0.813	0.94	0.027	0.032	0.037
b2	1.17	1.27	1.45	0.046	0.050	0.057
e	2.54BSC			0.100BSC		
A	4.30	4.57	4.72	0.169	0.180	0.186
A1	1.17	1.27	1.37	0.046	0.050	0.054
A2	2.47	2.57	2.67	0.097	0.101	0.105
c	0.48	0.50	0.60	0.019	0.020	0.024
Ø P	3.79	3.835	3.89	0.149	0.151	0.153
Q	2.59	2.747	2.89	0.102	0.108	0.114



ACE1106M

N-Channel 60-V MOSFET

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 used 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 whose 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.

ACE Technology Co., LTD.
<http://www.ace-ele.com/>