ACE2320M
N-Channel 20-V MOSFET

Description

ACE2320M 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 $r_{DS(on)}$ provides higher efficiency and extends battery life
- Low thermal impedance copper leadframe SOT-23 saves board space
- Fast switching speed
- High performance trench technology

Applications

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

Absolute Maximum Ratings

Parameter		Symbol	Limit	Units
Drain-Source Voltage		V_{DS}	20	V
Gate-Source Voltage		V_{GS}	±8	V
Continuous Drain Current [a]	T_A=25℃	I_D	7.0	A
	T_A=70℃		5.5	
Pulsed Drain Current [b]		I_{DM}	20	A
Continuous Source Current (Diode Conduction) [a]		I_S	1.9	A
Power Dissipation [a]	T_A=25℃	P_D	1.3	W
	T_A=70℃		0.8	
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	$R_{\theta JA}$	100	°C/W
	Steady State		166	

Notes

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

b. Pulse width limited by maximum junction temperature

ACE2320M
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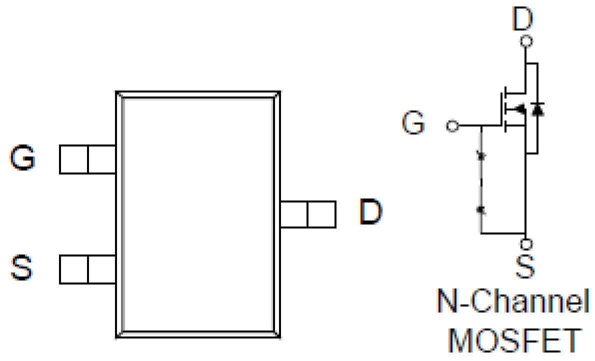
Packaging Type
SOT-23-3



Ordering information

ACE2320M BM + H

- Halogen - free
- Pb - free
- BM : SOT-23-3

Electrical Characteristics

T_A=25℃, unless otherwise specified.

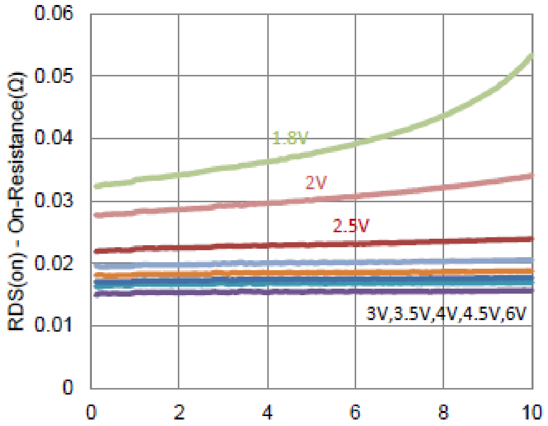
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Static						
Gate-Source Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}$, I_D = 250 uA	1			V
Gate-Body Leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ±8 V			±10	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 16 V, V_{GS} = 0 V			1	uA
		V_{DS} = 16V, V_{GS} = 0 V, T_J = 55℃			25	
On-State Drain Current[A]	$I_{D(on)}$	V_{DS} = 5 V, V_{GS} = 10 V	10			A
Drain-Source On-Resistance[A]	$R_{DS(ON)}$	V_{GS} = 4.5V, I_D = 5.6 A			18	mΩ
		V_{GS} = 2.5 V, I_D = 4.5 A			21	
Forward Transconductance[A]	g_{FS}	V_{DS} =15 V, I_D = 5.6 A		12		S
Diode Forward Voltage	V_{SD}	I_S = 1 A, V_{GS} = 0 V		0.69		V
Dynamic [b]						
Total Gate Charge	Q_g	V_{DS} = 10V, V_{GS} = 4.5 V, I_D = 5.6 A		11		nC
Gate-Source Charge	Q_{gs}			1.9		
Gate-Drain Charge	Q_{gd}			3.8		
Turn-On Delay Time	$t_{d(on)}$	V_{DS} = 10 V, R_L = 1.8 Ω, I_D = 5.6 A, V_{GEN} = 4.5 V, R_{GEN} = 6Ω,		367		ns
Rise Time	t_r			1337		
Turn-Off Delay Time	$t_{d(off)}$			4697		
Fall Time	t_f			3037		
Input Capacitance	C_{iss}	V_{DS} = 15 V, V_{GS} = 0 V, f =1 MHz		628		
Output Capacitance	C_{oss}			105		
ReverseTransfer Capacitance	C_{rss}			99		

Note :

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

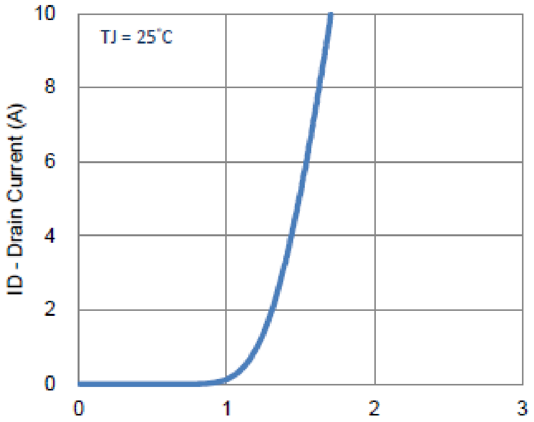
b. Guaranteed by design, not subject to production testing

Typical Performance Characteristics (N-Channel)



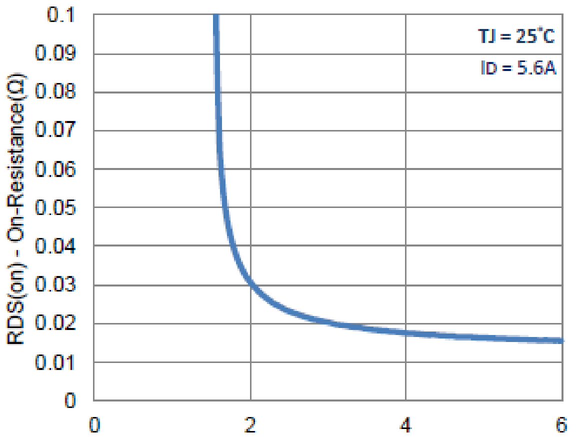
ID-Drain Current (A)

1. On-Resistance vs. Drain Current



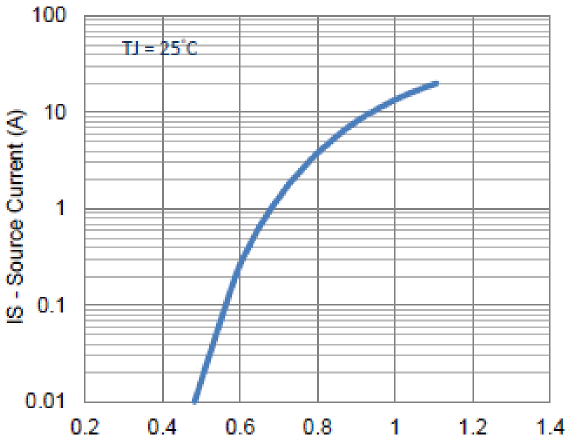
VGS - Gate-to-Source Voltage (V)

2. Transfer Characteristics



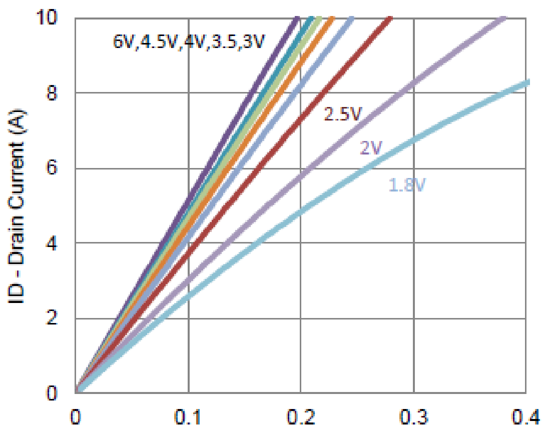
VGS - Gate-to-Source Voltage (V)

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



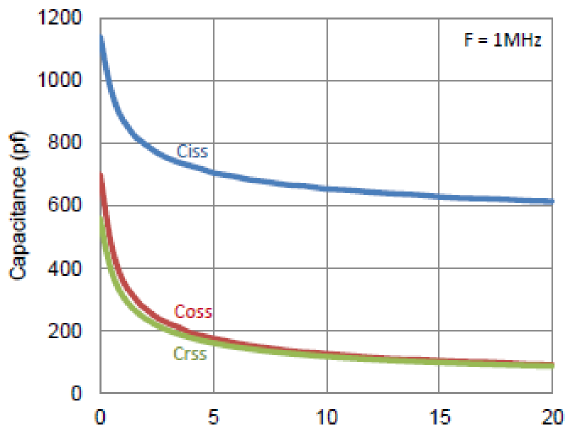
VSD - Source-to-Drain Voltage (V)

4. Drain-to-Source Forward Voltage



VDS - Drain-to-Source Voltage (V)

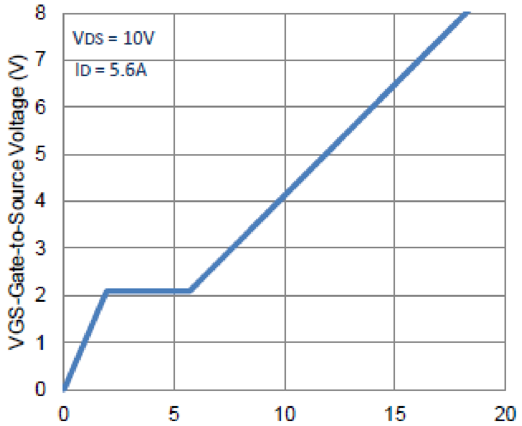
5. Output Characteristics



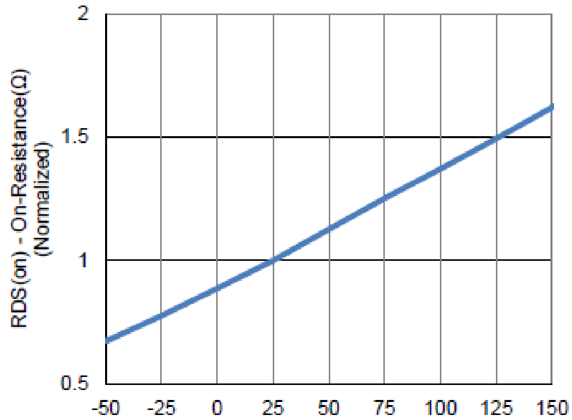
VDS-Drain-to-Source Voltage (V)

6. Capacitance

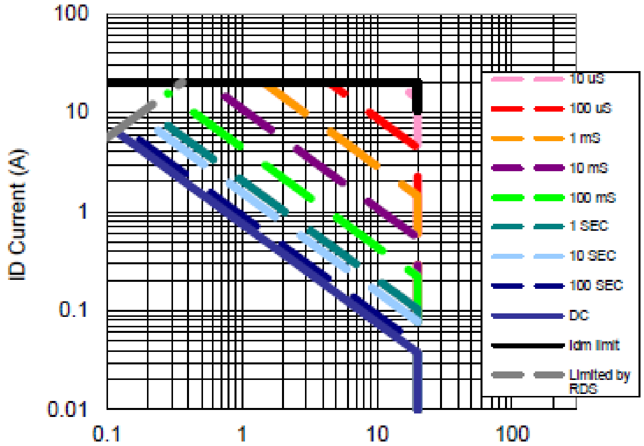
Typical Performance Characteristics



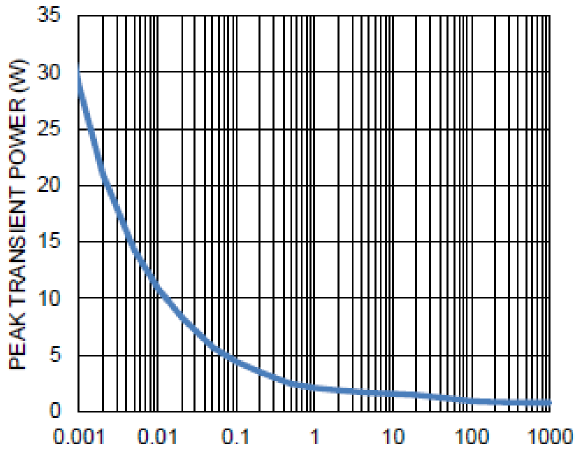
Qg - Total Gate Charge (nC)
7. Gate Charge



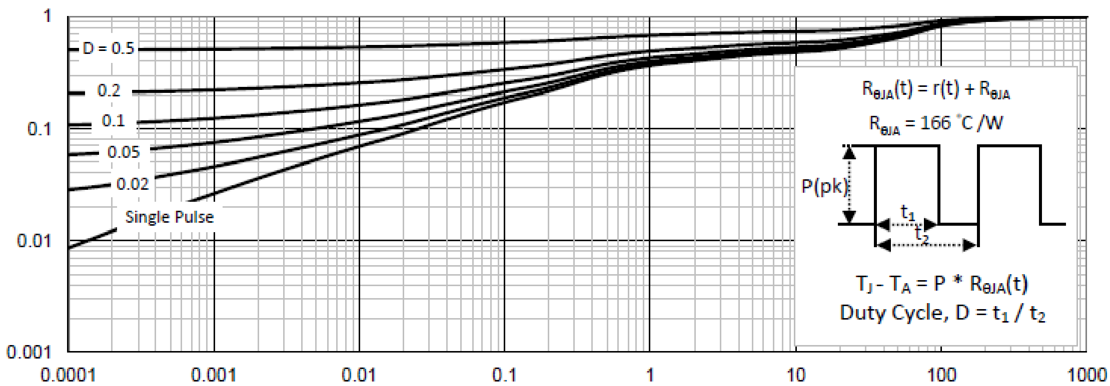
TJ –Junction Temperature(°C)
8. Normalized On-Resistance Vs Junction Temperature



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



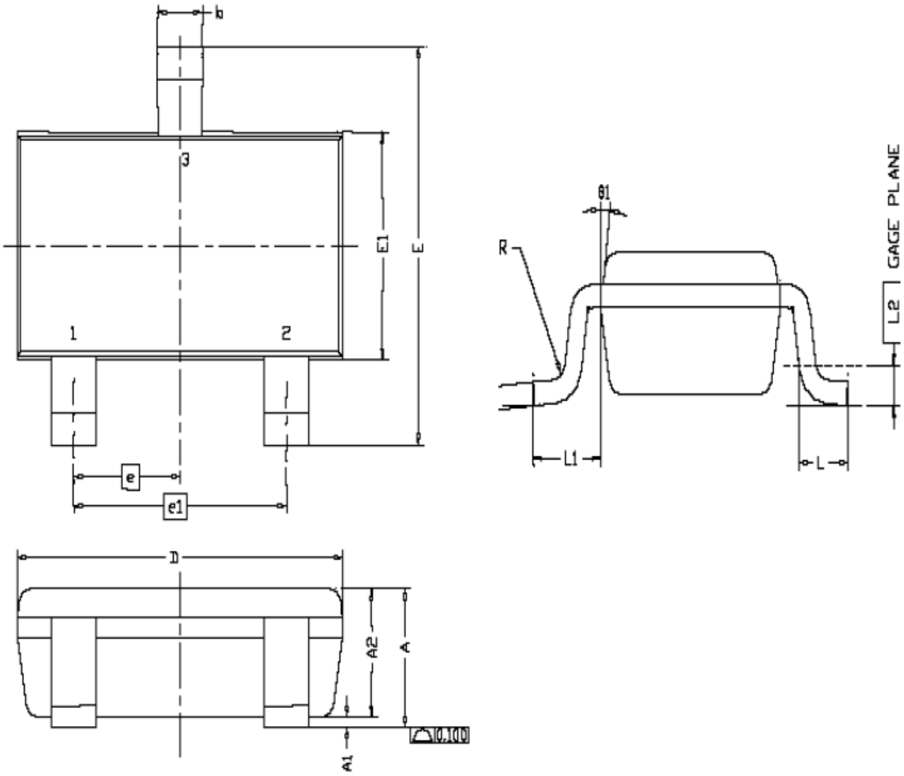
t1 TIME (SEC)
10. Single Pulse Maximum Power Dissipation



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

Packing Information

SOT-23-3



SYMBOLS	MILLIMETERS		
	MIN	NOM	MAX
A	0.80	0.95	1.10
A1	0.01		0.10
A2	0.85	0.90	0.925
b	0.30	0.40	0.50
C	0.10	0.15	0.25
D	2.70	2.90	3.10
E	2.60	2.80	3.00
E1	1.4	1.60	1.80
e	0.95 BSC		
e1	1.90 BSC		
L	0.30	0.40	0.60
L1	0.60REF		
L2	0.25BSC		
R	0.10		
Θ	0°	4°	8°
Θ1	7°NOM		

nit: mm

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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