ACE15006M

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

Features

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

Product Summary		
V_{DS} (V)	r_{DS}(on) (mΩ)	I_D(A)
60	13 @ V_{GS} = 10V	51
	18 @ V_{GS} = 4.5V	44

Applications

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

Absolute Maximum Ratings

Parameter		Symbol	Limit	Units
Drain-Source Voltage		V_{DS}	60	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current [a]	T_A=25°C	I_D	51	A
Pulse Drain Current [b]		I_{DM}	200	A
Continuous Drain Current (Diode Continuous) [a]		I_S	51	A
Power Dissipation [a]	T_A=25°C	P_D	50	W
Operating Junction and Storage Temperature Range		T_J,T_{STG}	-55 to 175	°C

Parameter	Symbol	Maximum	Units
Maximum Junction-to-Ambient [a]	$R_{\theta JA}$	40	℃/W
Maximum Junction-to-Case	$R_{\theta JC}$	3	℃/W

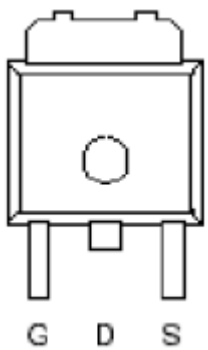
Notes

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

b. Pulse width limited by maximum junction temperature

Packaging Type

TO-252



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Ordering information

ACE15006M XX + H

- Halogen - free
- Pb - free
- YM: TO-252

Electrical Characteristics

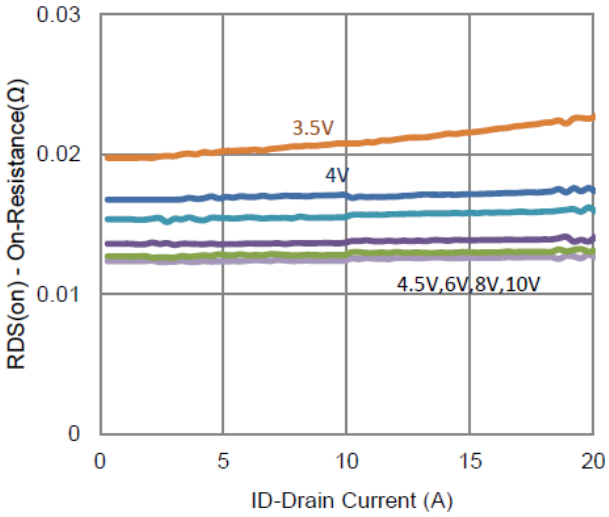
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Static						
Gate Source Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250uA	1			V
Gate Body Leakage	I_{GSS}	V_{DS}=0V, V_{GS}=±20V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=48V, V_{GS}=0V			1	uA
		V_{DS}=48V, V_{GS}=0V, T_J=55℃			25	
On-State Drain-Current [a]	$I_{D(on)}$	V_{DS}=5V, V_{GS}=10V	35			A
Drain-Source On-Resistance [a]	$r_{DS(ON)}$	V_{GS}=10V,I_D=20A			13	mΩ
		V_{GS}=4.5V,I_D=16A			18	
Forward Transconductance [a]	g_{fS}	V_{DS}=15V,I_D=20A		24		S
Diode Forward Voltage [a]	V_{SD}	I_S=25.5A ,V_{GS}=0V		0.9		V
Dynamic [b]						
Total Gate Charge	Q_g	V_{DS}=30V, V_{GS}=4.5V, I_D=20A		20		nC
Gate-Source Charge	Q_{gs}			5.9		
Gate-Drain Charge	Q_{gd}			11		
Turn-On Delay Time	$t_{d(on)}$	V_{DS}=30V, ,R_L=1.5Ω I_D=20A ,V_{GEN}=10V R_{GEN}=6Ω,		10		ns
Rise Time	t_f			11		
Turn-Off Delay Time	$t_{d(off)}$			61		
Fall Time	t_f			19		
Input Capacitance	C_{iss}	V_{DS}=15V, V_{GS}=0V f=1MHz		2022		pF
Output Capacitance	C_{oss}			101		
Reverse Transfer Capacitance	C_{rss}			158		

Note:

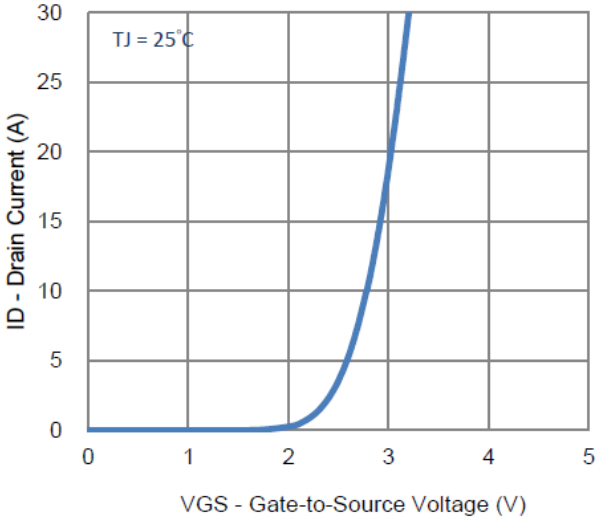
a. Pulse test: PW <= 300us duty cycle <= 2%.

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

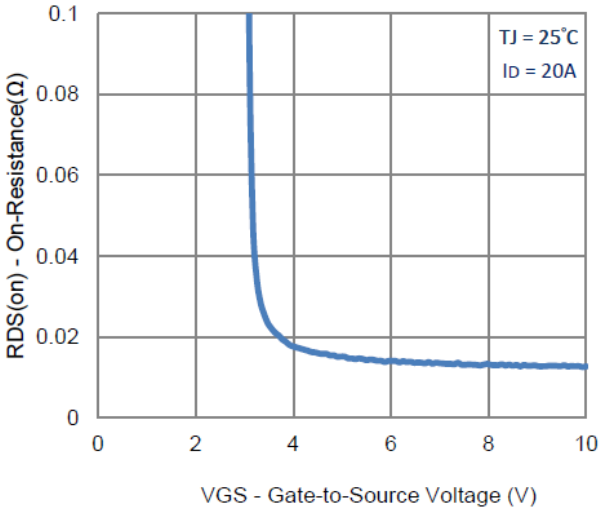
Typical Electrical Characteristics



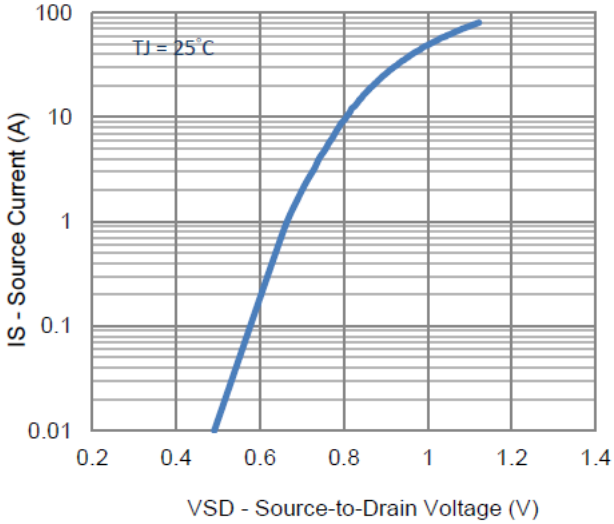
1. On-Resistance vs. Drain Current



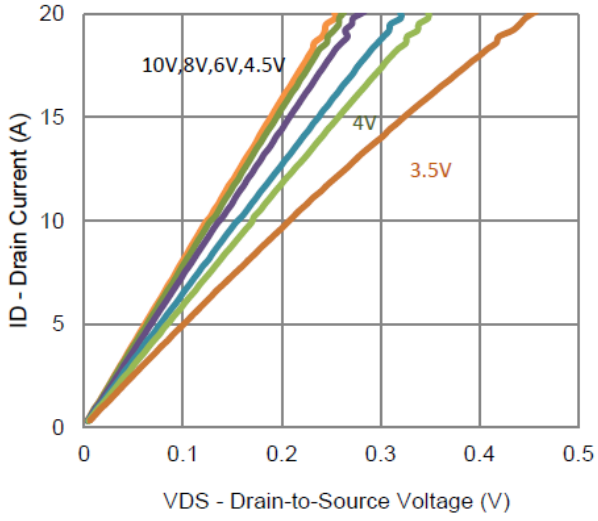
2. Transfer Characteristics



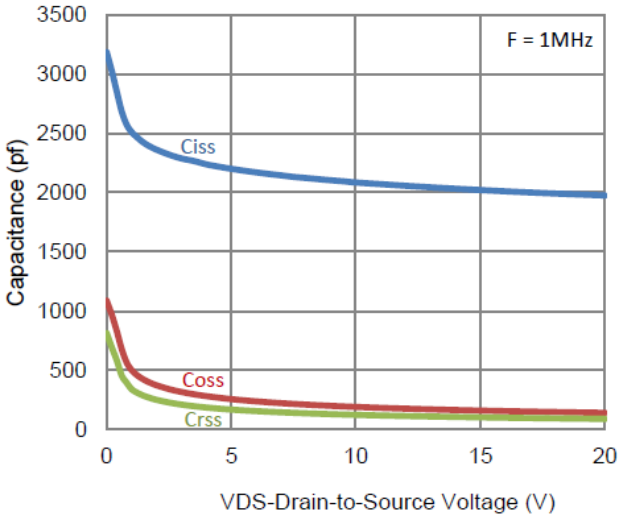
3. On-Resistance vs. Gate-to-Source Voltage



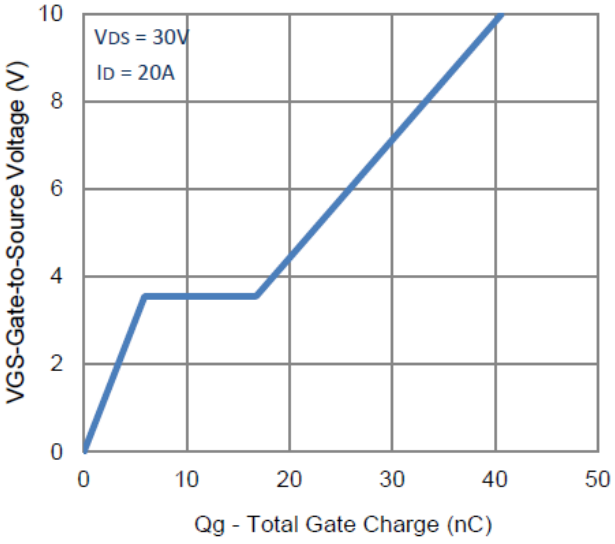
4. Drain-to-Source Forward Voltage



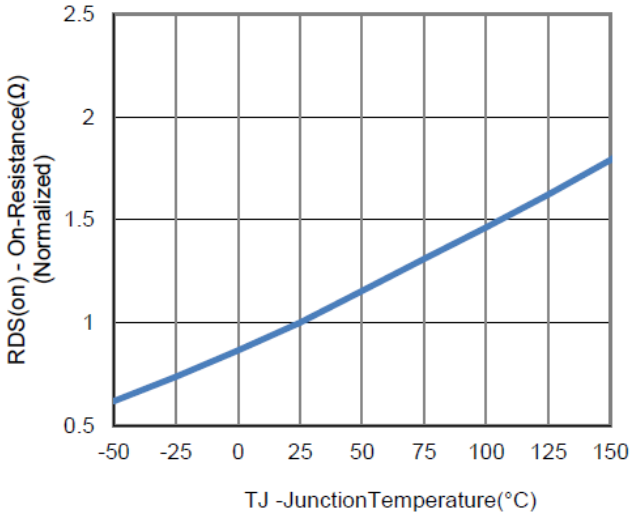
5. Output Characteristics



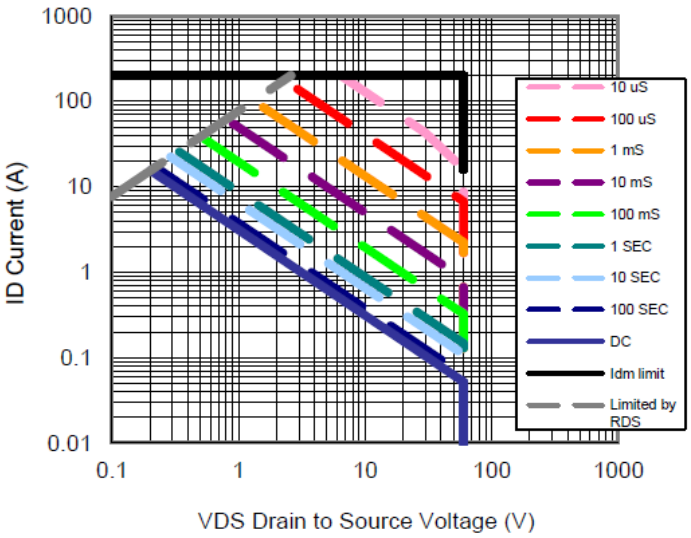
6. Capacitance



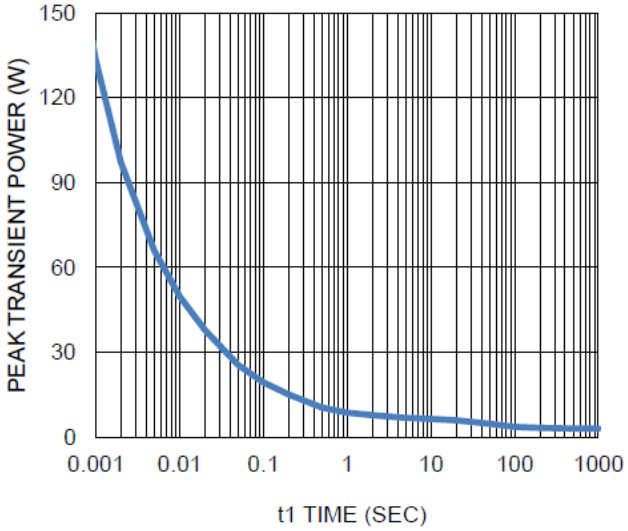
7. Gate Charge



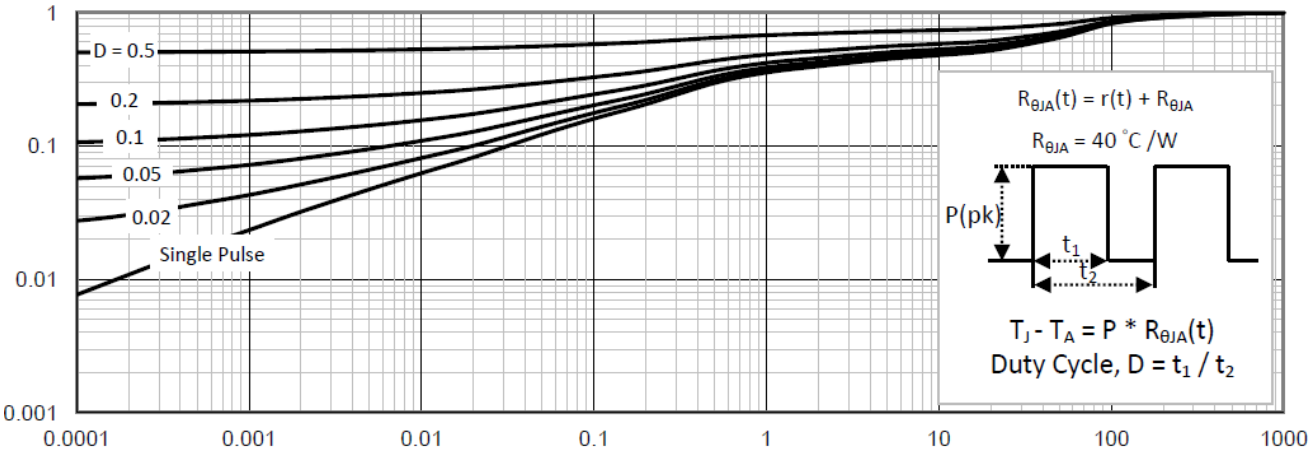
8. Normalized On-Resistance Vs Junction Temperature



9. Safe Operating Area



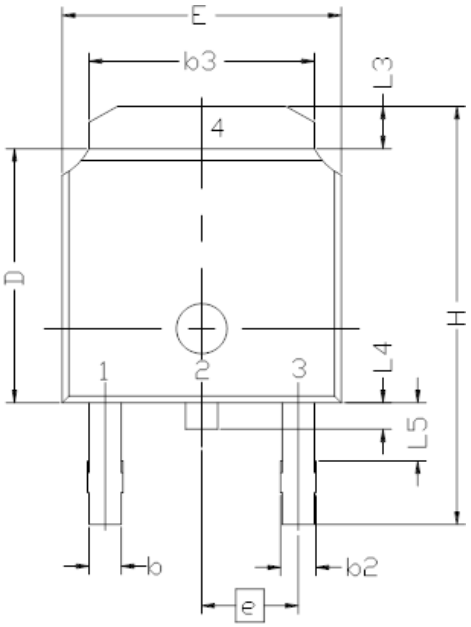
10. Single Pulse Maximum Power Dissipation

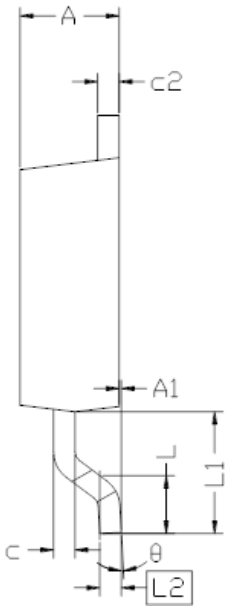


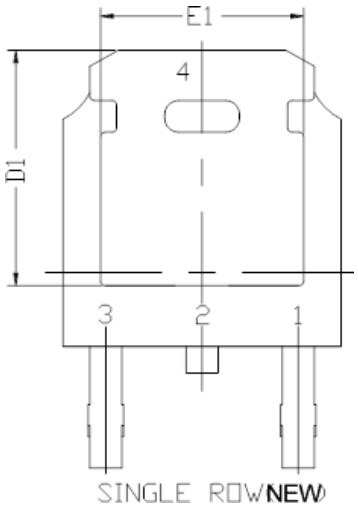
11. Normalized Thermal Transient Junction to Ambient

Packing Information

TO-252







Symbols	Dimensional Reqmts		
	MIN	NOM	MAX
E	6.40	6.60	6.731
L	1.40	1.52	1.77
L1		2.743 REF	
L2		0.508 BSC	
L3	0.89		1.27
L4	0.64		101
L5			
D	6.00	6.10	6.223
H	9.40	10.00	10.40
b	0.64	0.76	0.88
b2	0.77	0.84	1.14
b3	5.21	5.34	5.46
e		2.286 BSC	
A	2.20	2.30	2.38
A1	0		0.127
c	0.45	0.50	0.60
c2	0.45	0.50	0.58
D1	5.30		
E1	4.40		
θ1	0°		10°

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.