ACE4600M

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

Description

The ACE4600M uses advanced trench technology to provide excellent $R_{DS(ON)}$ and low gate charge. This device is suitable for use as a load switch or in PWM applications. The source leads are separated to allow a kelvin connection to the source, which may be used to bypass the source inductance.

Features

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

PRODUCT SUMMARY		
V_{DS} (V)	r_{DS}(on) (mΩ)	I_D(A)
60	16@ V_{GS} = 4.5V	15
	19@ V_{GS} = 2.5V	13

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}	±12	V
Continuous Drain Current [a]	T_A=25 °C	I_D	15	A
	T_A=70 °C		11.6	
Pulse Drain Current [b]		I_{DM}	50	
Continuous Drain Current (Diode Continuous) [a]		I_S	7.3	A
Power Dissipation [a]	T_A=25 °C	P_D	5	W
	T_A=70 °C		3.2	
Operating Junction and Storage Temperature Range		T_J, T_{STG}	-55 to 150	°C

Parameter		Symbol	Maximum	Units
Maximum Junction-to-Ambient [a]	t≦10sec	$R_{θJA}$	25	℃/W
	Steady State		65	℃/W

Notes

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

b. Pulse width limited by maximum junction temperature

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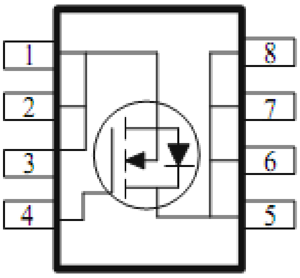
Packaging Type

DFN5*6-8L



Ordering information

ACE4600M XX + H

- Halogen - free
- Pb - free
- PN : DFN5*6-8L

Electrical Characteristics

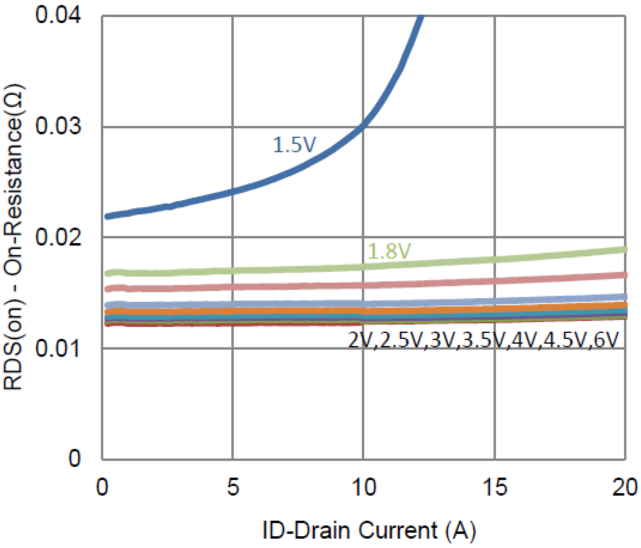
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Static						
Gate Source Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}$, $I_D=250uA$	0.5			V
Gate Body Leakage	I_{GSS}	$V_{DS}=0V$, $V_{GS}=\pm12V$			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=-48V$, $V_{GS}=0V$			1	uA
		$V_{DS}=48V$, $V_{GS}=0V$, $T_J=55℃$			25	
On-State Drain-Current [a]	$I_{D(on)}$	$V_{DS}=5V$, $V_{GS}=4.5V$	20			A
Static Drain-Source On-Resistance [a]	$r_{DS(ON)}$	$V_{GS}=4.5V$,$I_D=11.6A$			16	mΩ
		$V_{GS}=2.5V$,$I_D=9.3A$			19	
Forward Transconductance [a]	g_{fS}	$V_{DS}=15V$,$I_D=11.6A$		20		S
Diode Forward Voltage [a]	V_{SD}	$I_S=3.65A$,$V_{GS}=0V$		0.69		V
Dynamic [b]						
Total Gate Charge	Q_g	$V_{DS}=30V$, $V_{GS}=4.5V$, $I_D=11.6A$		37		nC
Gate-Source Charge	Q_{gs}			4.7		
Gate-Drain Charge	Q_{gd}			9		
Turn-On Delay Time	$t_{d(on)}$	$V_{DS}=30V$, ,$R_L=2.6Ω$ $I_D=11.6A$,$V_{GEN}=10V$ $R_{GEN}=6Ω$,		15		ns
Rise Time	t_r			31		
Turn-Off Delay Time	$t_{d(off)}$			148		
Fall Time	t_f			46		
Input Capacitance	C_{iss}	$V_{DS}=15V$, $V_{GS}=0V$ f=1MHz		3326		pF
Output Capacitance	C_{oss}			180		
Reverse Transfer Capacitance	C_{rss}			163		

Note:

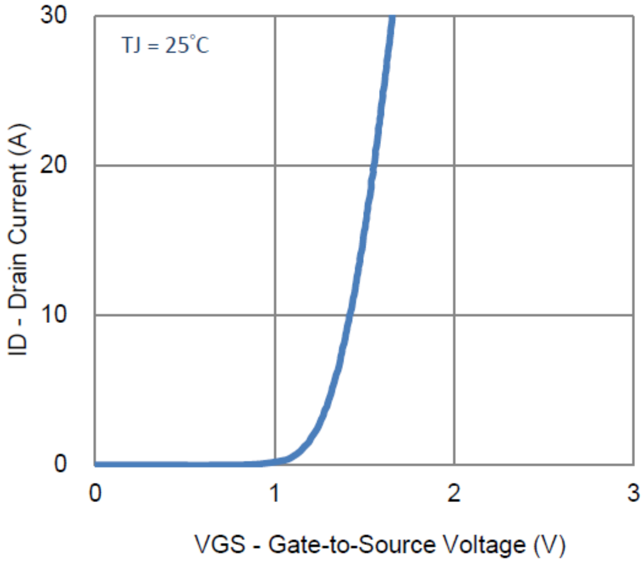
a. Pulse test: PW <= 300us duty cycle <= 2%.

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

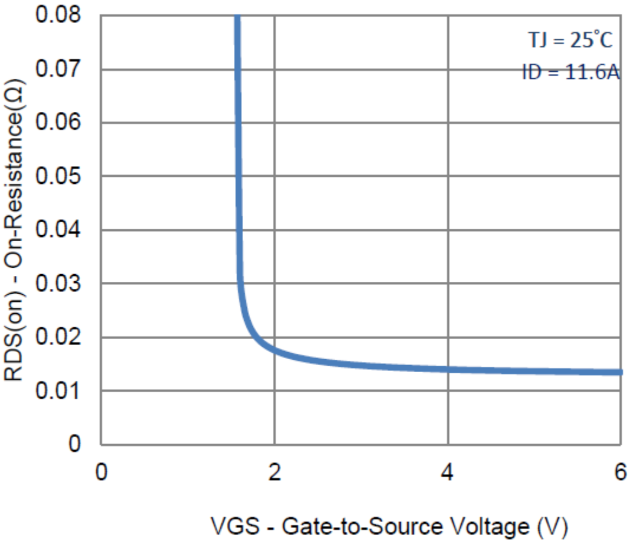
Typical Electrical Characteristics



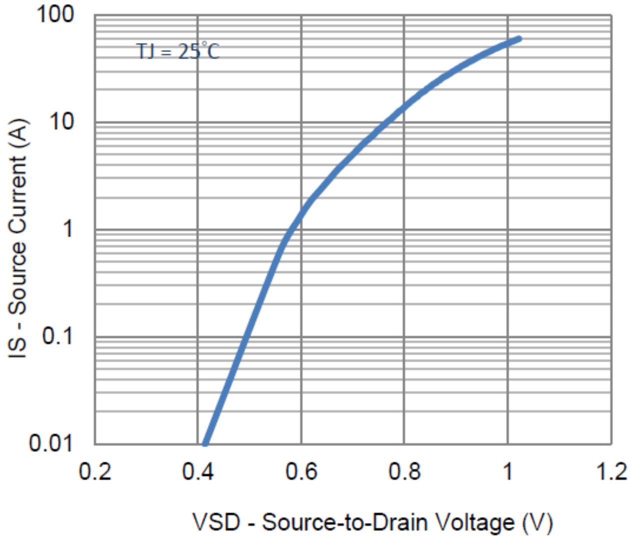
1. On-Resistance vs. Drain Current



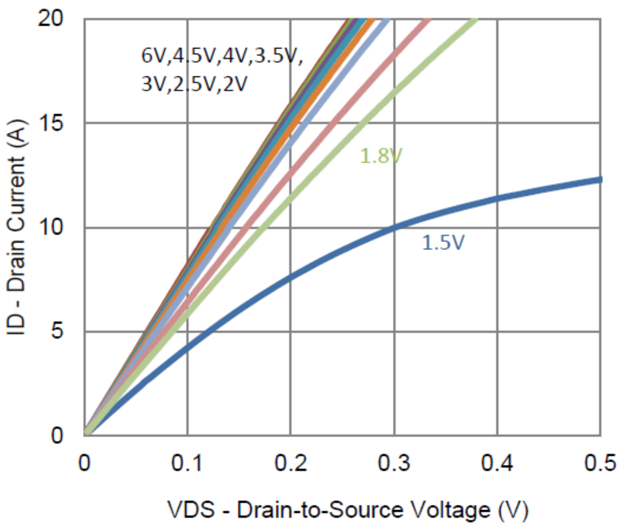
2. Transfer Characteristics



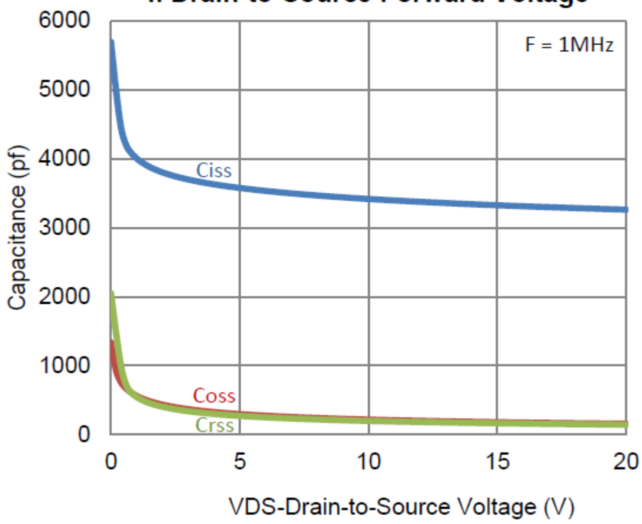
3. On-Resistance vs. Gate-to-Source Voltage



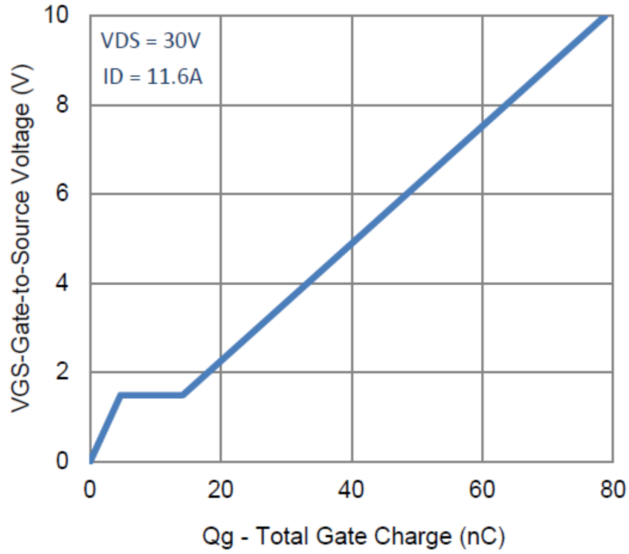
4. Drain-to-Source Forward Voltage



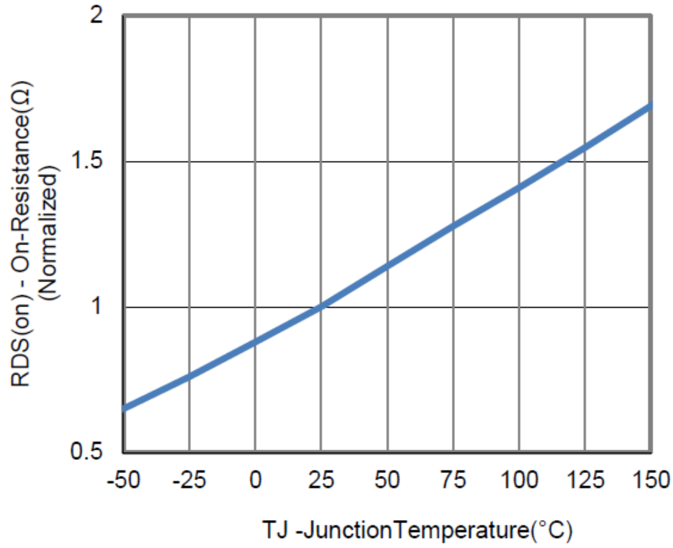
5. Output Characteristics



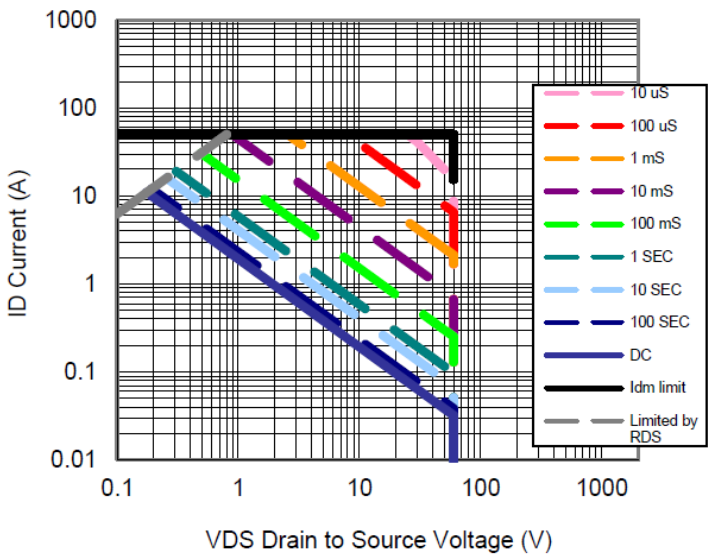
6. Capacitance



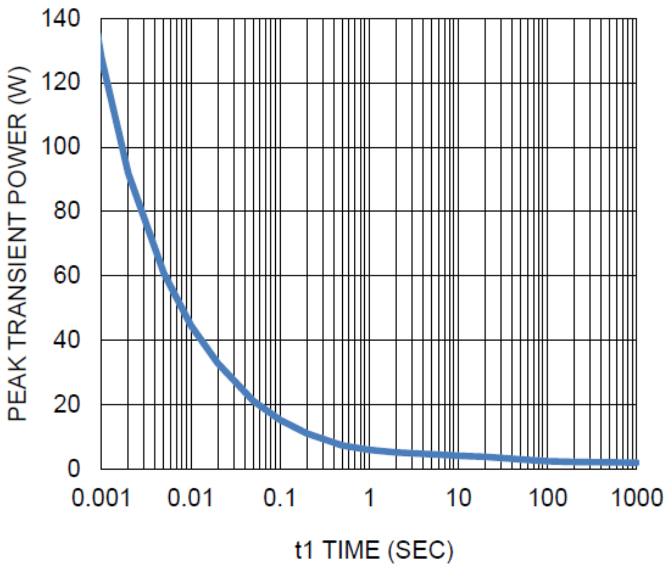
7. Gate Charge



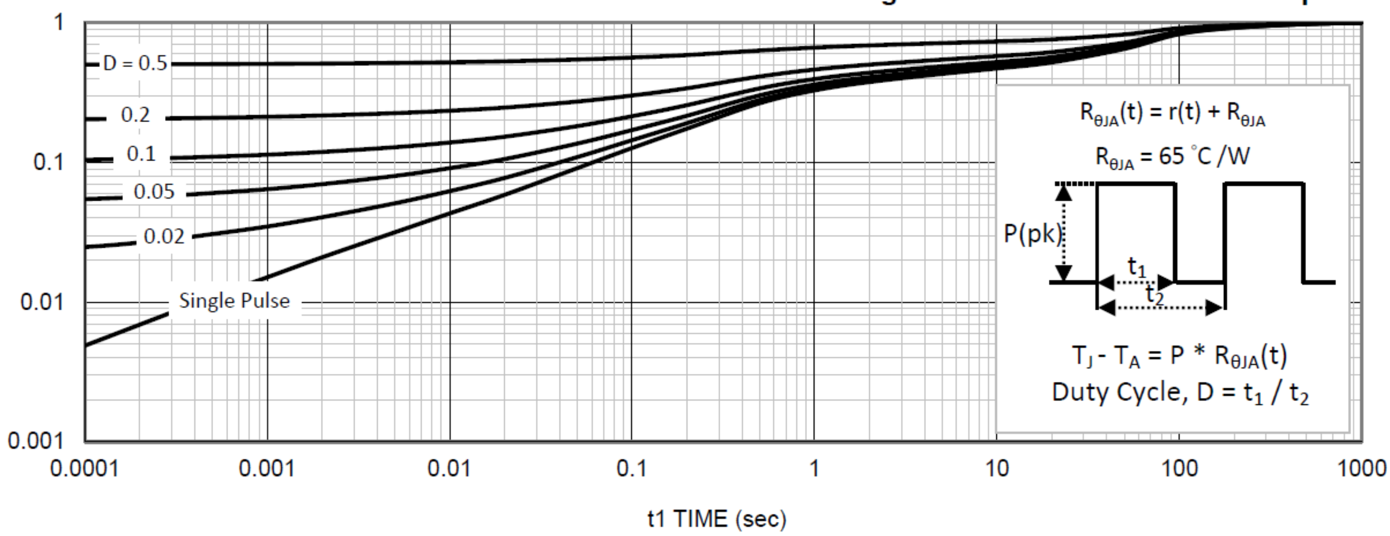
8. Normalized On-Resistance Vs Junction Temperature



9. Safe Operating Area



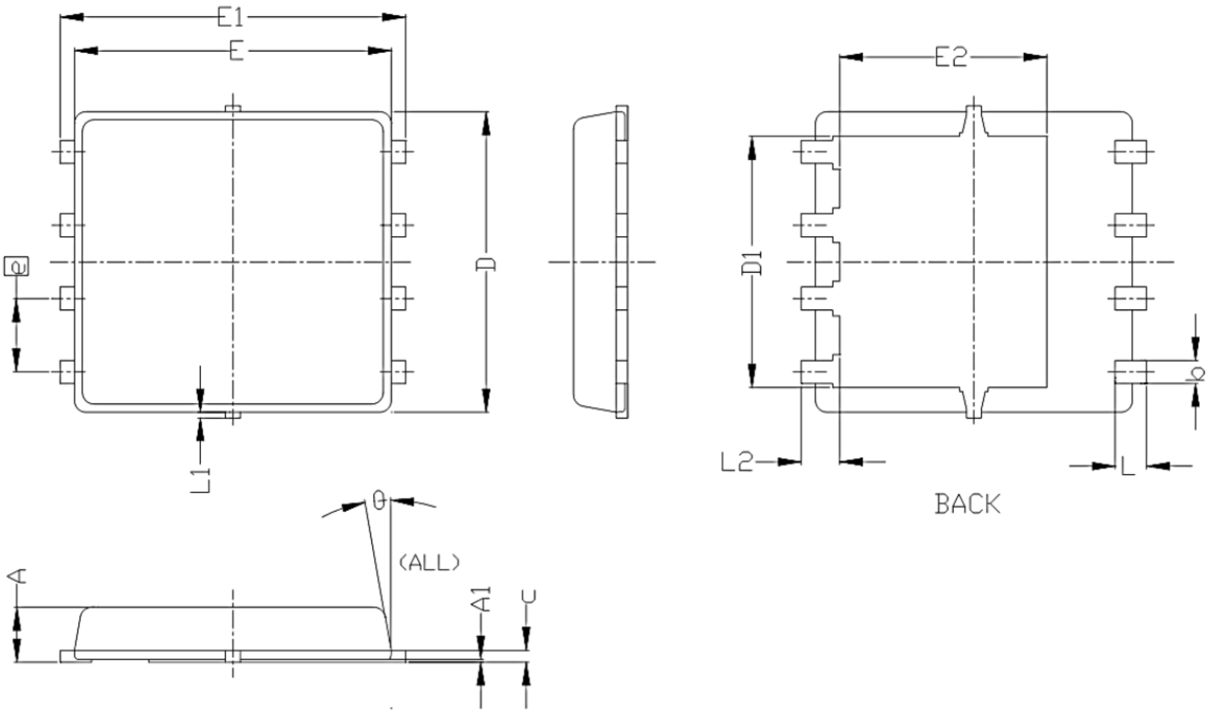
10. Single Pulse Maximum Power Dissipation



11. Normalized Thermal Transient Junction to Ambient

Packing Information

DFN5*6-8L



SYMBOLS	DIMENSIONS IN MILLIMETERS			DIMENSIONS IN INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.85			0.033	0.037	0.039
A1	0.00			0.000		0.002
b	0.30			0.012	0.016	0.020
c	0.15			0.006	0.008	0.010
D	5.20BSC			0.205BSC		
D1	4.35BSC			0.171BSC		
E	5.55BSC			0.219BSC		
E1	6.05BSC			0.238BSC		
E2	3.62BSC			0.143BSC		
e	1.27BSC			0.050BSC		
L	0.45	0.55	0.65	0.018	0.022	0.026
L1	0		0.15	0		0.006
L2	0.68REF			0.027REF		
θ1	0°		10°	0°		10°

Notes

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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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