



# ACE2305

## P-Channel Enhancement Mode MOSFET

### Description

The ACE2305 is the P-Channel logic enhancement mode power field effect transistors are produced using high cell density, DMOS trench technology.

This high density process is especially tailored to minimize on-state resistance.

These devices are particularly suited for low voltage application such as cellular phone and notebook computer power management and Battery powered circuits, and low in-line power loss are needed in a very small outline surface mount package.

### Features

- -15V/-3.5A,  $R_{DS(ON)}=70m\Omega@V_{GS}=-4.5V$
- -15V/-3.0A,  $R_{DS(ON)}=85m\Omega@V_{GS}=-2.5V$
- -15V/-2.0A,  $R_{DS(ON)}=105m\Omega@V_{GS}=-1.8V$
- Super high density cell design for extremely low  $R_{DS(ON)}$
- Exceptional on-resistance and maximum DC current capability

### Application

- Power Management in Note book
- Portable Equipment
- Battery Powered System
- DC/DC Converter
- Load Switch
- DSC
- LCD Display inverter

### Absolute Maximum Ratings

( $T_A=25^\circ C$  Unless otherwise noted)

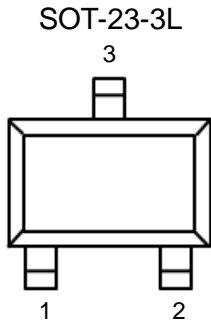
Parameter	Symbol	Typical	Unit	
Drain-Source Voltage	$V_{DSS}$	-15	V	
Gate-Source Voltage	$V_{GSS}$	$\pm 12$	V	
Continuous Drain Current ( $T_J=150^\circ C$ )	$I_D$	$T_A=25^\circ C$	-3.5	A
		$T_A=70^\circ C$	-2.8	
Pulsed Drain Current	$I_{DM}$	-10	A	
Continuous Source Current (Diode Conduction)	$I_S$	-1.6	A	
Power Dissipation	$P_D$	$T_A=25^\circ C$	1.25	W
		$T_A=70^\circ C$	0.8	
Operating Junction Temperature	$T_J$	150	$^\circ C$	
Storage Temperature Range	$T_{STG}$	-55/150	$^\circ C$	
Thermal Resistance-Junction to Ambient	$R_{\theta JA}$	120	$^\circ C/W$	



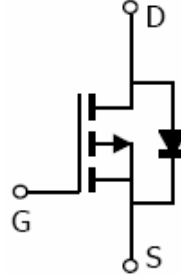
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### Packaging Type

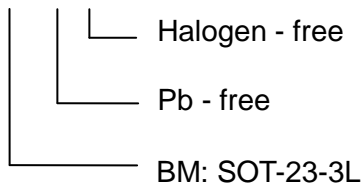


SOT-23-3L	Description
1	Gate
2	Source
3	Drain



### Ordering information

ACE2305 XX + H



### Electrical Characteristics

(T<sub>A</sub>=25°C, Unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
<b>Static</b>						
Drain-Source Breakdown Voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> =0V, I <sub>D</sub> =-250uA	-15			V
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =-250uA	-0.35		-0.85	
Gate Leakage Current	I <sub>GSS</sub>	V <sub>DS</sub> =0.V, V <sub>GS</sub> =±10V			±100	nA
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =-12V, V <sub>GS</sub> =0V			-1	uA
		V <sub>DS</sub> =-12V, V <sub>GS</sub> =0V T <sub>J</sub> =55°C			-10	
On-State Drain Current	I <sub>D(ON)</sub>	V <sub>DS</sub> ≤ -5V, V <sub>GS</sub> =-4.5V	-4			A
		V <sub>DS</sub> ≤ -5V, V <sub>GS</sub> =-2.5V	-2			
Drain-Source On-Resistance	R <sub>DS(ON)</sub>	V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-3.5A		0.055	0.070	Ω
		V <sub>GS</sub> =-2.5V, I <sub>D</sub> =-3.0A		0.065	0.085	
		V <sub>GS</sub> =-1.8V, I <sub>D</sub> =-2.0A		0.085	0.105	
Forward Transconductance	G <sub>fs</sub>	V <sub>DS</sub> =-5.0V, I <sub>D</sub> =-3.5A		8.5		S
Diode Forward Voltage	V <sub>SD</sub>	I <sub>S</sub> =-1.5A, V <sub>GS</sub> =0V		-0.8	-1.2	V
<b>Dynamic</b>						
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> =-6V, V <sub>GS</sub> =-4.5V, I <sub>D</sub> ≡-2.8A		4.8	8	nC
Gate-Source Charge	Q <sub>gs</sub>			1.0		
Gate-Drain Charge	Q <sub>gd</sub>			1.0		



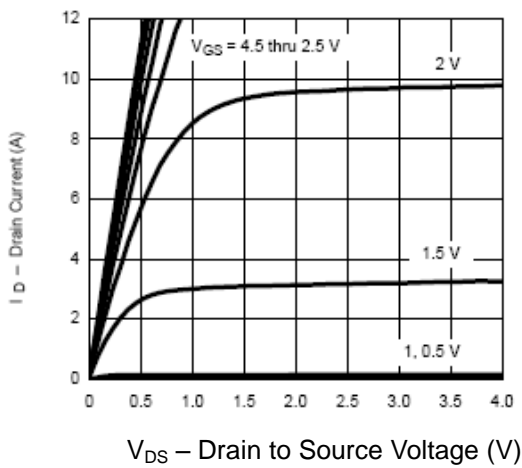
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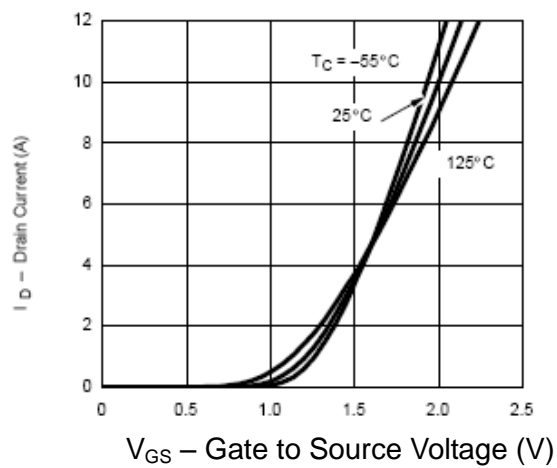
Input Capacitance	$C_{iss}$	$V_{DS}=-6V, V_{GS}=0V,$ $f=1MHz$	485		pF
Output Capacitance	$C_{oss}$		85		
Reverse Transfer Capacitance	$C_{rss}$		40		
Turn-On Time	$t_{d(on)}$	$V_{DD}=-6V, R_L=6\Omega$ $I_D=-1.0A, V_{GEN}=-4.5V$ $R_G=6\Omega$	10	16	ns
	$t_r$		13	23	
Turn-Off Time	$t_{d(off)}$		18	25	
	$t_f$		15	20	

### Typical Characteristics

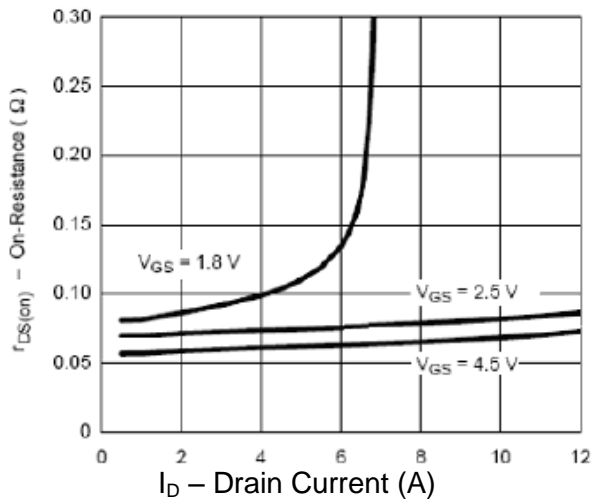
Output Characteristics



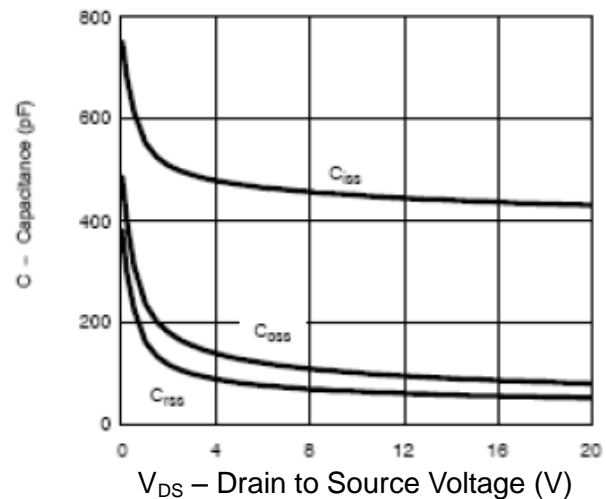
Transfer Characteristics



On-Resistance vs. Drain Current



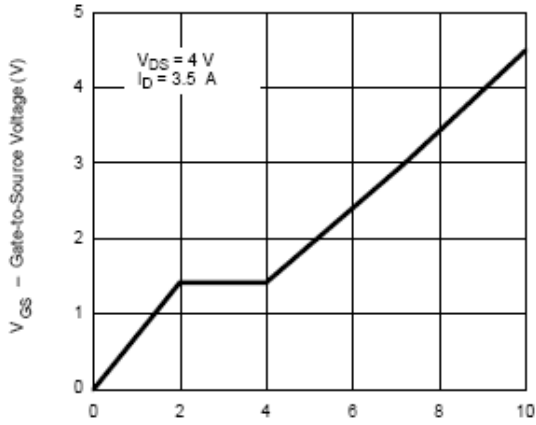
Capacitance





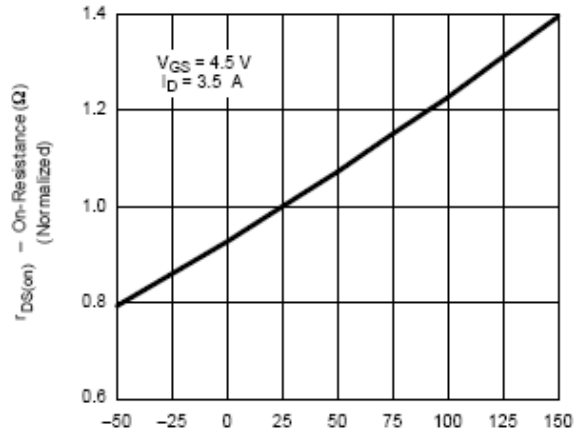
**Typical Characteristics**

Gate Charge



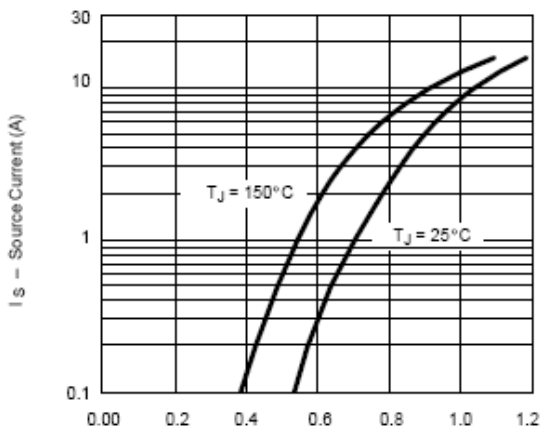
$Q_g$  Total Gate Charge (nC)

On-Resistance vs. Junction Temperature



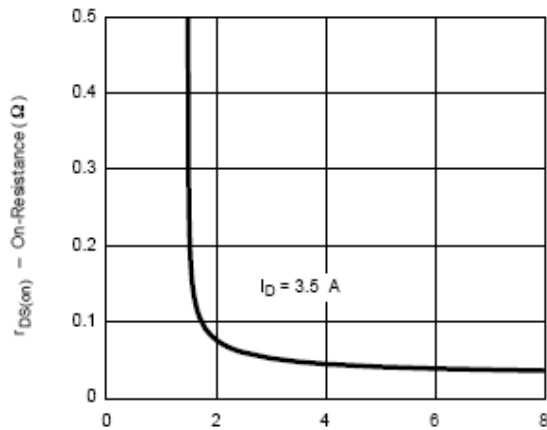
$T_J$  - Junction Temperature ( $^{\circ}\text{C}$ )

Source-Drain Diode Forward Voltage



$V_{SD}$  Source to Drain Voltage (V)

On-Resistance vs. Gate-to-Source Voltage

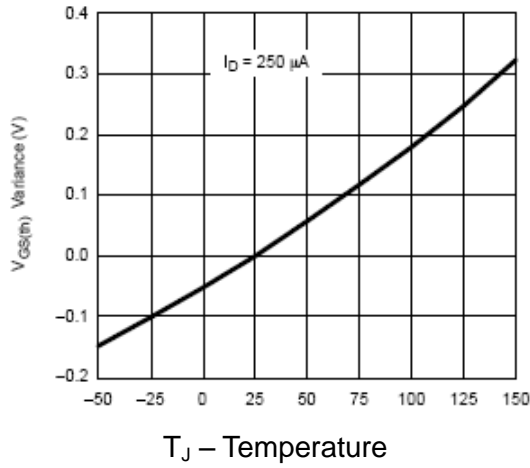


$V_{GS}$  - Gate to Source Voltage (V)

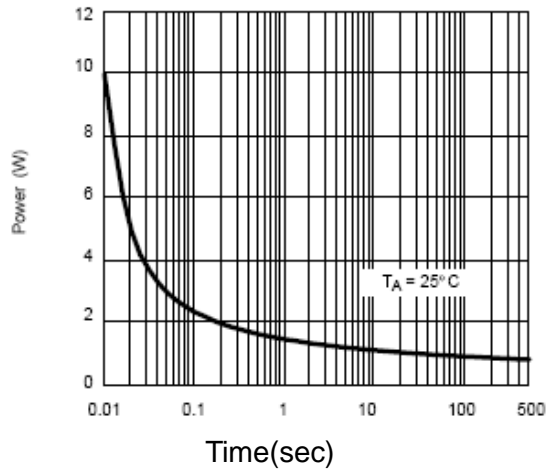


Typical Characteristics

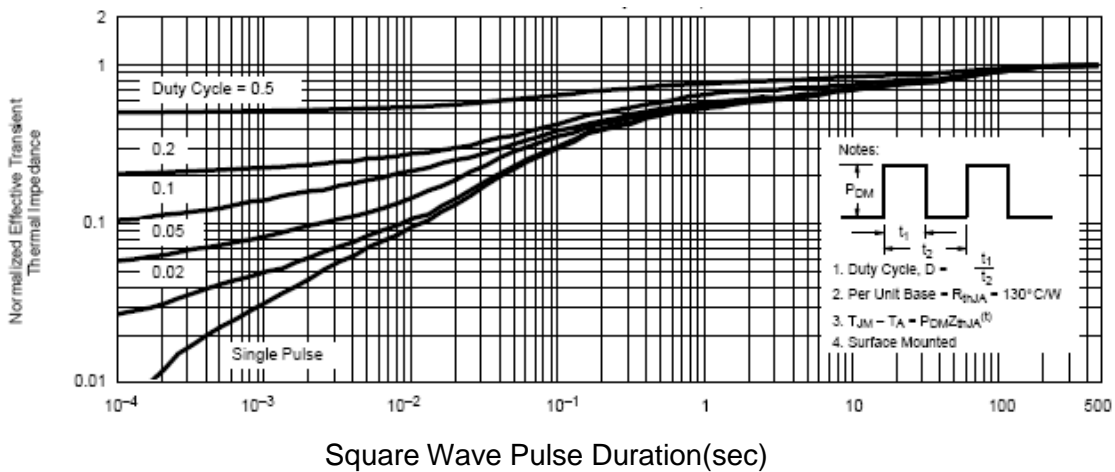
Threshold Voltage



Single Pulse Power



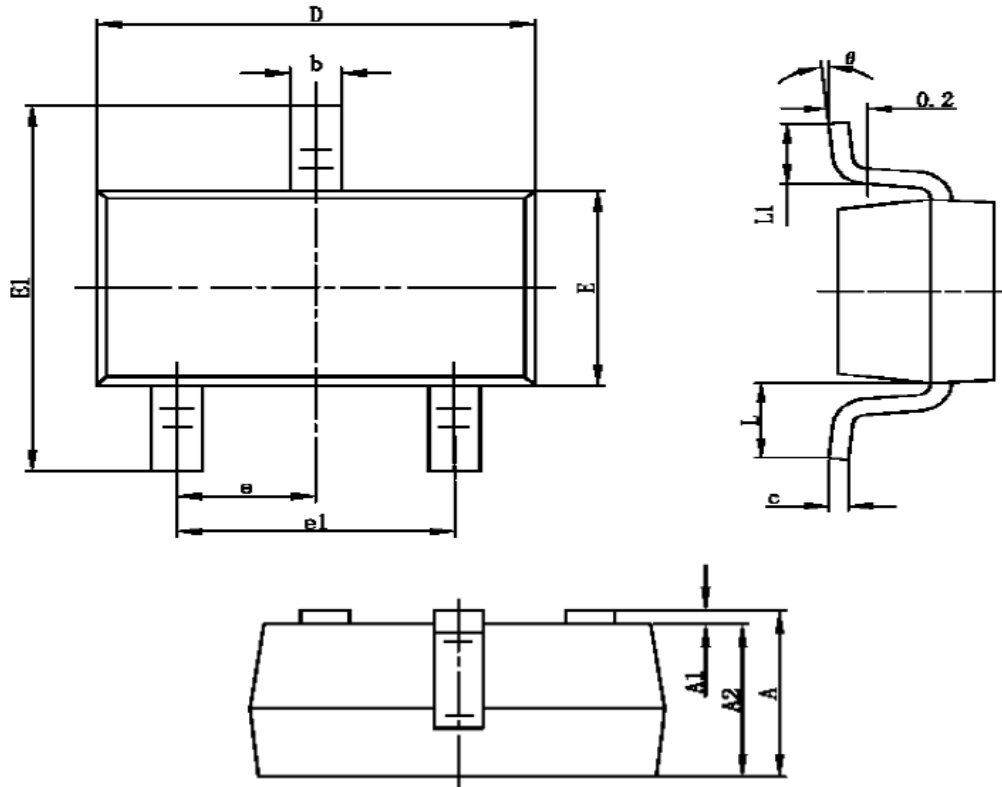
Normalized Thermal Transient Impedance, Junction-to-Ambient





Packing Information

SOT-23-3L



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.400	0.012	0.016
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	1.500	1.700	0.059	0.067
E1	2.650	2.950	0.104	0.116
e	0.950TYP		0.037TYP	
e1	1.800	2.000	0.071	0.079
L	0.700REF		0.028REF	
L1	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°



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### Notes

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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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