

## DESCRIPTION

The AO3407L is the P-Channel logic enhancement mode power field effect transistor is produced using high cell density advanced trench technology to provide excellent  $R_{DS(ON)}$ . This device is suitable for use as a load switch or in PWM and gate charge for most of the synchronous buck converter applications

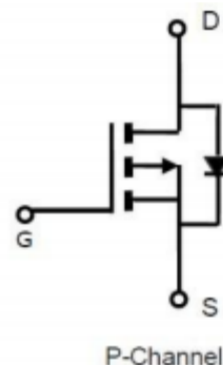
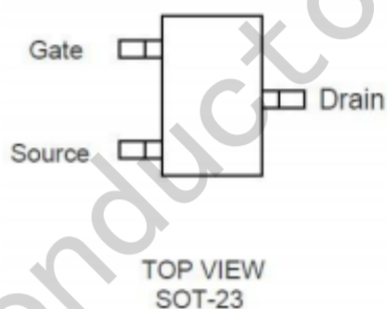
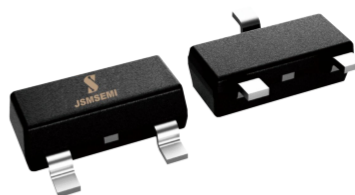
## FEATURE

- ◆ -30V/-4.3A,  $R_{DS(ON)}=37m\Omega$  (typ.)@ $V_{GS}=-10V$
- ◆ -30V/-3.0A,  $R_{DS(ON)}=52m\Omega$  (typ.)@ $V_{GS}=-4.5V$
- ◆ Super high design for extremely low  $R_{DS(ON)}$
- ◆ Exceptional on-resistance and Maximum DC current capability
- ◆ Full RoHS compliance
- ◆ SOT23-3L package design

## APPLICATIONS

- ◆ High Frequency Point-of-load Synchronous
- ◆ Buck Converter for MB/NB/UMPC/VGA
- ◆ DC/DC Converter
- ◆ Load Switch

## PIN CONFIGURATION



## ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ Unless otherwise noted )

Symbol	Parameter		Typical	Unit
$V_{DSS}$	Drain-Source Voltage		-30	V
$V_{GSS}$	Gate-Source Voltage		$\pm 20$	V
$I_D$	Continuous Drain Current ( $T_C=25^\circ\text{C}$ )	$V_{GS}=-10V$	-4.3	A
	Continuous Drain Current ( $T_C=70^\circ\text{C}$ )		-3.6	
$I_{DM}$	Pulsed Drain Current		-20	A
$I_S$	Continuous Source Current (Diode Conduction)		-1.4	A
$P_D$	Power Dissipation	$T_A=25^\circ\text{C}$	1.4	W
		$T_A=70^\circ\text{C}$	0.9	
$T_J$	Operation Junction Temperature		150	$^\circ\text{C}$
$T_{STG}$	Storage Temperature Range		-55~+150	$^\circ\text{C}$
$R_{\theta JA}$	Thermal Resistance Junction to Ambient		120	$^\circ\text{C}/W$

**Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged. Absolute maximum ratings are stress rating only and functional device operation is not implied**

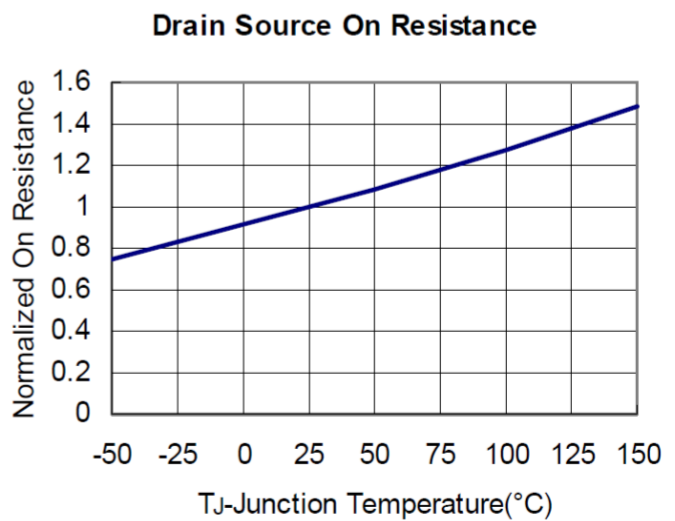
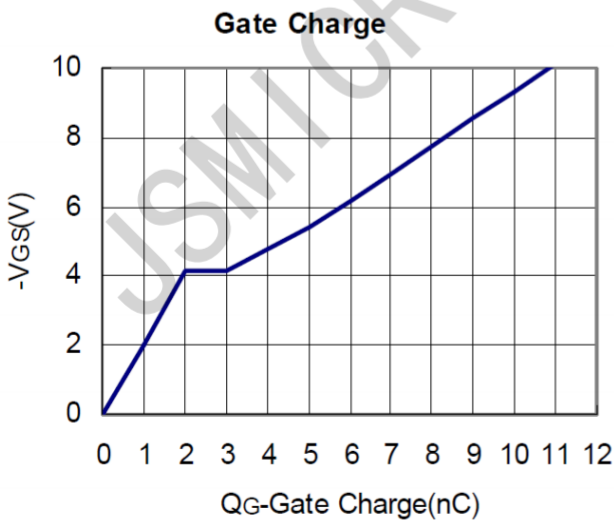
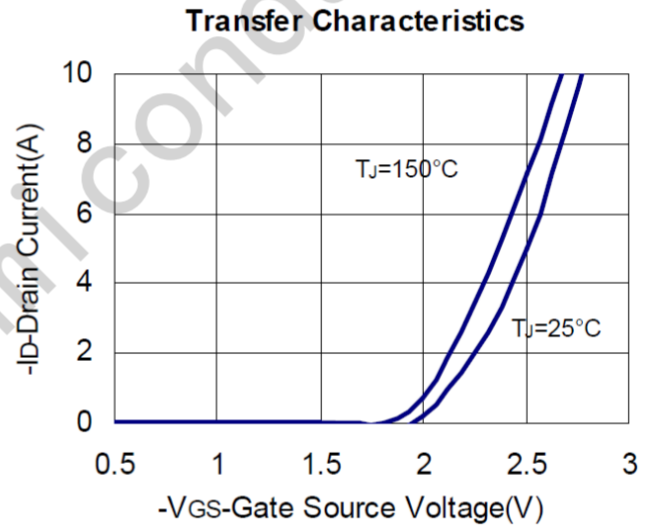
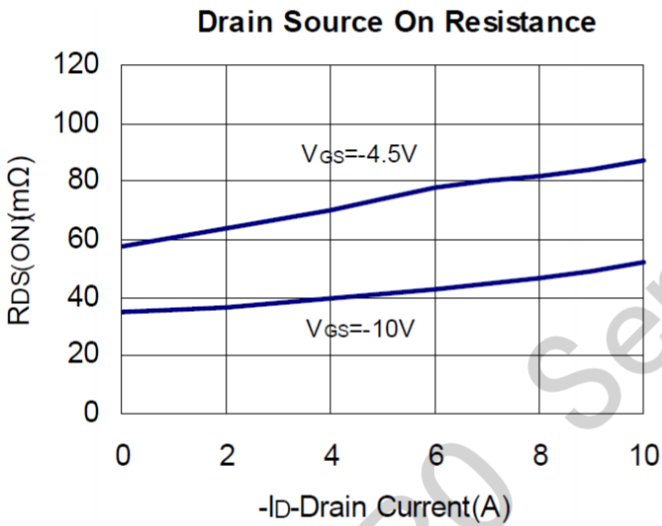
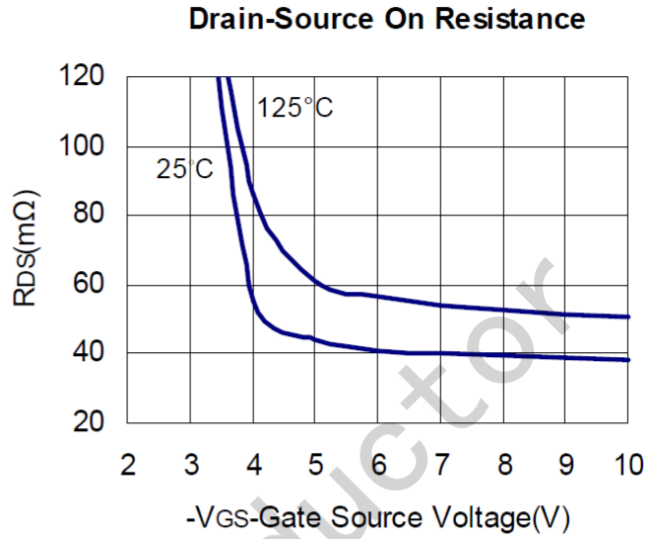
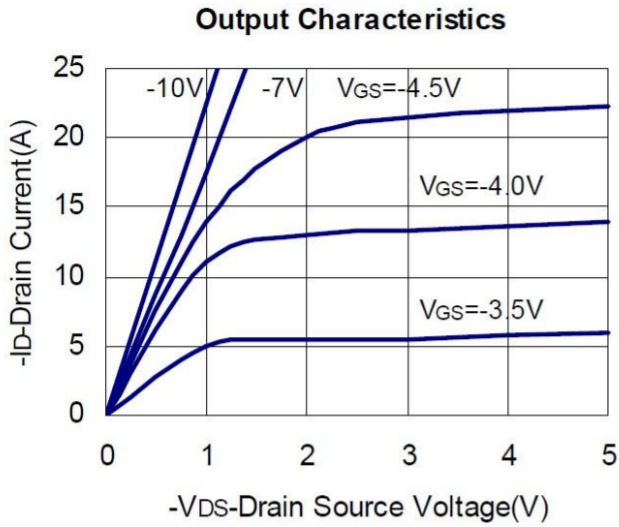
**ELECTRICAL CHARACTERISTICS** ( $T_A=25^\circ\text{C}$  Unless otherwise noted)

Symbol	Parameter	Condition	Min	Typ	Max	Unit
<b>Static Parameters</b>						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=-250\mu A$	-30			V
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=-250\mu A$	-1.0		-2.0	V
$I_{GSS}$	Gate Leakage Current	$V_{DS}=0V, V_{GS}=\pm 20V$			$\pm 100$	nA
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS}=-24V, V_{GS}=0$			-1	uA
		$V_{DS}=-24V, V_{GS}=0$ $T_J=55^\circ\text{C}$			-5	
$R_{DS(ON)}$	Drain-Source On-Resistance	$V_{GS}=-10V, I_D=-4.3A$		37	50	m $\Omega$
		$V_{GS}=-4.5V, I_D=-3.0A$		52	75	
<b>Source-Drain Diode</b>						
$V_{SD}$	Diode Forward Voltage	$I_S=-1.0A, V_{GS}=0V$		-0.7	-1.0	V
<b>Dynamic Parameters</b>						
$Q_g$	Total Gate Charge	$V_{DS}=-20V$ $V_{GS}=-4.5V$ $I_D=-4.0A$		6		nC
$Q_{gs}$	Gate-Source Charge			2.7		
$Q_{gd}$	Gate-Drain Charge			3.1		
$C_{iss}$	Input Capacitance	$V_{DS}=-25V$ $V_{GS}=0V$ $f=1\text{MHz}$		645		pF
$C_{oss}$	Output Capacitance			272		
$C_{riss}$	Reverse Transfer Capacitance			105		
$T_{d(on)}$	Turn-On Time	$V_{DS}=-12V$ $I_D=-4A$		9		nS
$T_r$				16.5		
$T_{d(off)}$	Turn-Off Time	$V_{GEN}=-10V$ $R_G=3.3\Omega$		22		
$T_f$				21		

Note: 1. Pulse test: pulse width $\leq 300\mu\text{s}$ , duty cycle $\leq 2\%$

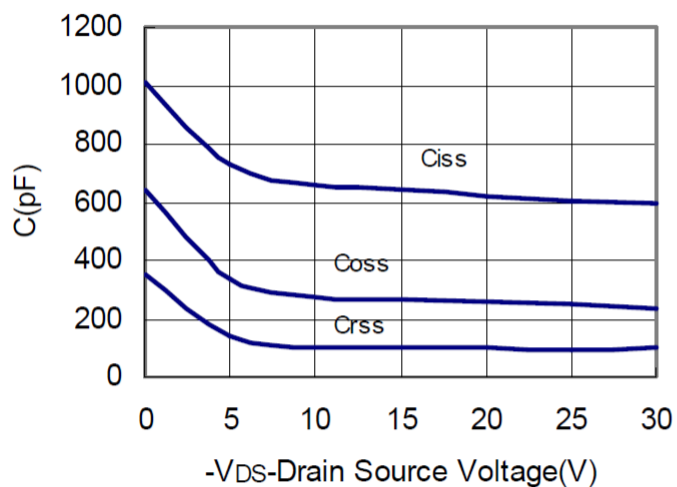
2. Static parameters are based on package level with recommended wire bonding

■ **TYPICAL CHARACTERISTICS** (25 °C Unless Note)

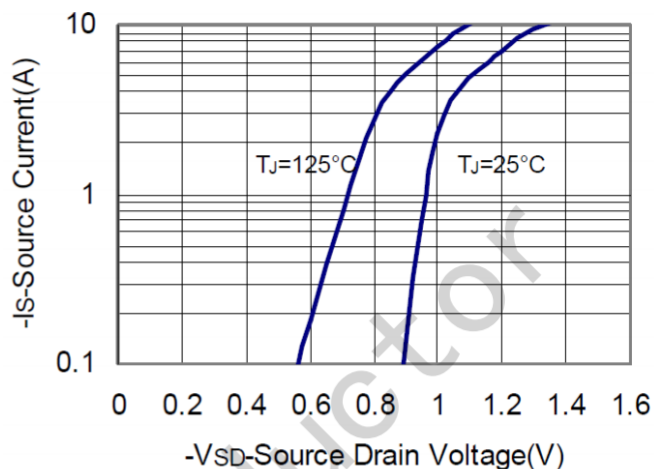


■ **TYPICAL CHARACTERISTICS** (continuous)

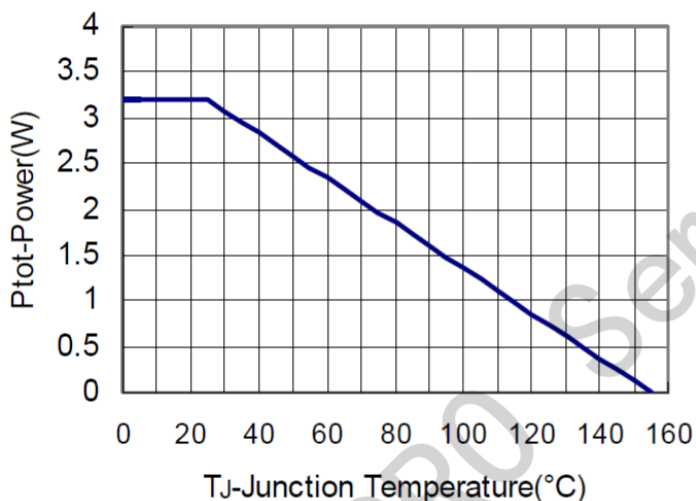
**Capacitance**



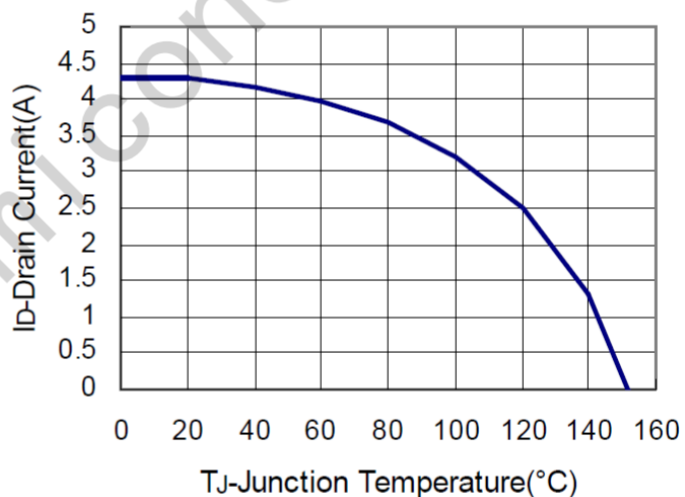
**Source Drain Diode Forward**



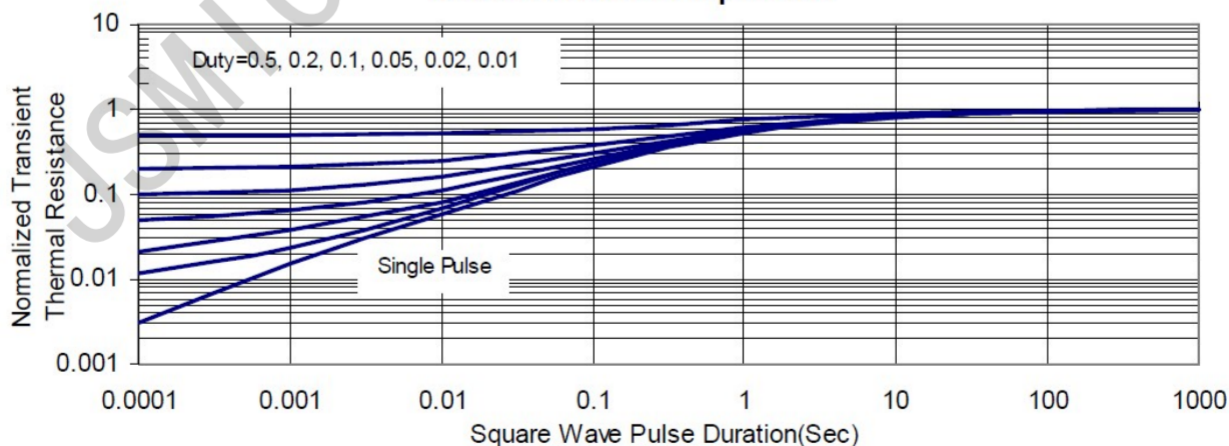
**Power Dissipation**



**Drain Current**

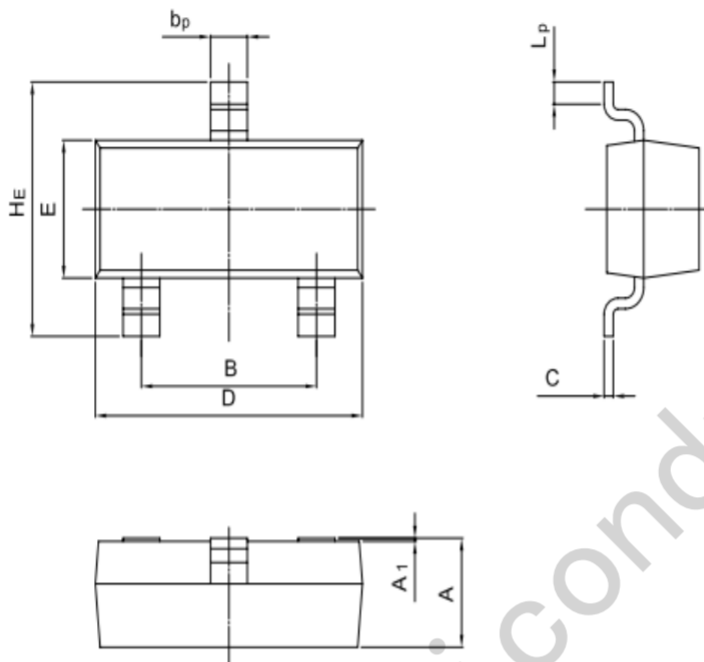


**Thermal Transient Impedance**



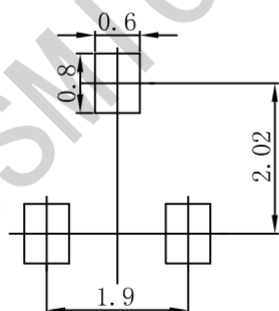
## Package Information

### SOT-23



UNIT	A	B	bp	C	D	E	HE	A1	Lp
mm	1.40 0.95	2.04 1.78	0.50 0.35	0.19 0.08	3.10 2.70	1.65 1.20	3.00 2.20	0.100 0.013	0.50 0.20

### SOT-23 Suggested Pad Layout



**Note:**

1. Controlling dimension: in millimeters.
2. General tolerance:  $\pm 0.05$  mm.
3. The pad layout is for reference purposes only.

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