

## N-Channel 30V (D-S) MOSFET

### PRODUCT SUMMARY

$V_{DS}$ (V)	$R_{DS(on)}$ ( $\Omega$ )	$I_D$ (A) <sup>a</sup>
30	0.012 at $V_{GS} = 10$ V	15
	0.015 at $V_{GS} = 4.5$ V	13

### Features

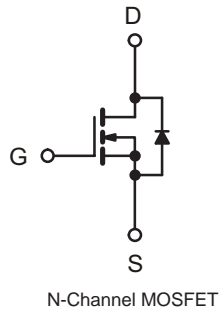
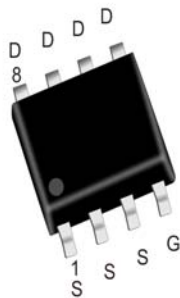
- Low Gate Charge
- RoHS Compliant

### Applications

- Notebook CPU Core  
- High-Side Switch

### Pin Configuration

SOP-8L



### Packing Information

Device	Marking	Reel Size	Tape Width	Quantity
ECG4172	13D .XXX	12"	13mm	3000pcs

### Absolute Maximum Ratings ( $T_J = 25^\circ\text{C}$ Unless Otherwise Noted)

Symbol	Parameter	Value	Unit
<b>P-MOSFET</b>			
$V_{DS}$	Drain-Source Voltage	30	V
$V_{GS}$	Gate-Source Voltage	$\pm 20$	V
$I_D$	Continuous Drain Current	15	A
$I_{DM}$	Pulse Drain Current	50	A
$P_D$	Maximum Power Dissipation	4.5	W
$T_J$	Junction Temperature	150	$^\circ\text{C}$
$T_{stg}$	Storage Temperature	-55~+150	$^\circ\text{C}$
$T_L$	Lead Temperature for Soldering Purposes(1/8" from case for 10 s)	260	$^\circ\text{C}$
<b>Thermal Resistance Ratings</b>			
$R_{thJA}$	Maximum Junction-to-Ambient $t \leq 10$ s	50	$^\circ\text{C/W}$
$R_{thJF}$	Maximum Junction-to-Foot (Drain) Steady State	28	$^\circ\text{C/W}$

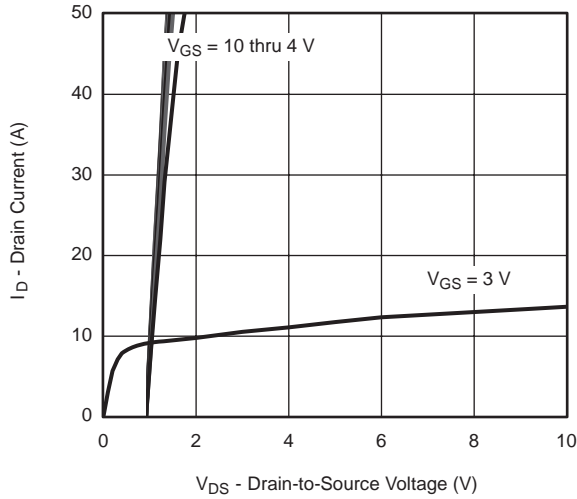
Notes:

a. Base on  $T_C = 25^\circ\text{C}$ .

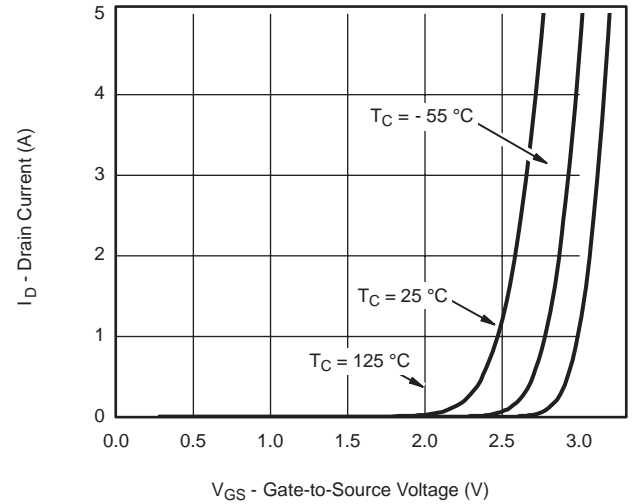
**Electrical Characteristics** ( $T_J = 25^{\circ}\text{C}$  Unless Otherwise Specified)

Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
STATIC PARAMETERS						
Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu A$	30			V
Zero gate voltage drain current	$I_{DSS}$	$V_{DS}=30V, V_{GS}=0V$			1	$\mu A$
Gate-body leakage current	$I_{GSS}$	$V_{GS}=\pm 20V, V_{DS}=0V$			$\pm 100$	nA
Gate threshold voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1.2		2.5	V
Drain-source on-resistance(note1)	$R_{DS(on)}$	$V_{GS}=10V, I_D=11A$		9.7	12	m $\Omega$
		$V_{GS}=4.5V, I_D=10A$		12.2	15	m $\Omega$
Forward transconductance(note1)	$g_{FS}$	$V_{DS}=15V, I_D=-11A$		52		S
Diode forward voltage(note1)	$V_{SD}$	$I_S=9A, V_{GS}=0V$		0.8	1.2	V
DYNAMIC						
Input capacitance	$C_{iss}$	$V_{DS}=15V, V_{GS}=0V, f=1MHz$		820		pF
Output capacitance	$C_{oss}$			195		pF
Reverse transfer capacitance	$C_{rss}$			73		pF
SWITCHING PARAMETERS (note 2)						
Turn-on delay time	$t_{d(on)}$	$V_{GS}=4.5V, V_{DD}=15V,$ $R_L=1.4\Omega, R_G=1\Omega, I_D=9A$		16	24	ns
Turn-on rise time	$t_r$			12	18	ns
Turn-off delay time	$t_{d(off)}$			16	24	ns
Turn-off fall time	$t_f$			10	20	ns
Total Gate Charge	$Q_g$	$V_{DS}=15V, V_{GS}=5V,$ $I_D=11A$		6.8	10.2	nC
Gate-Source Charge	$Q_{gs}$			2.5		nC
Gate-Drain Charge	$Q_{gd}$			2.3		nC

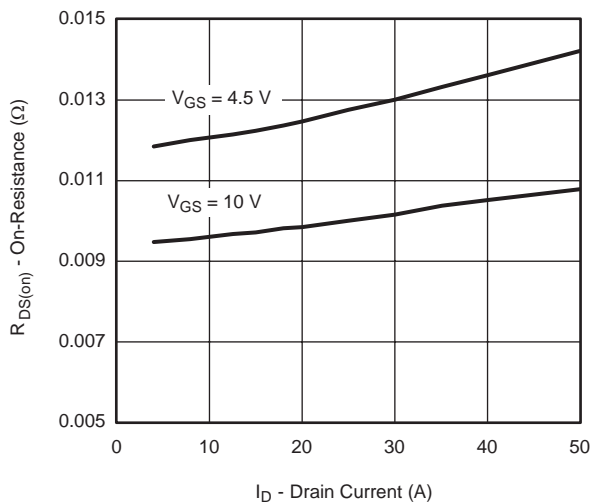
**MOSFET TYPICAL CHARACTERISTICS (25°C, unless otherwise noted)**



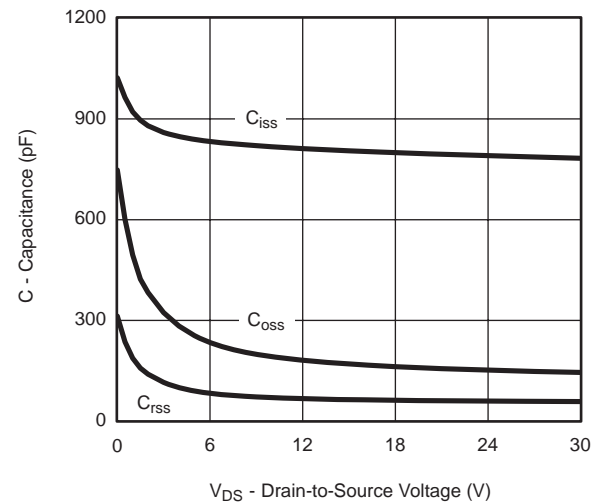
**Output Characteristics**



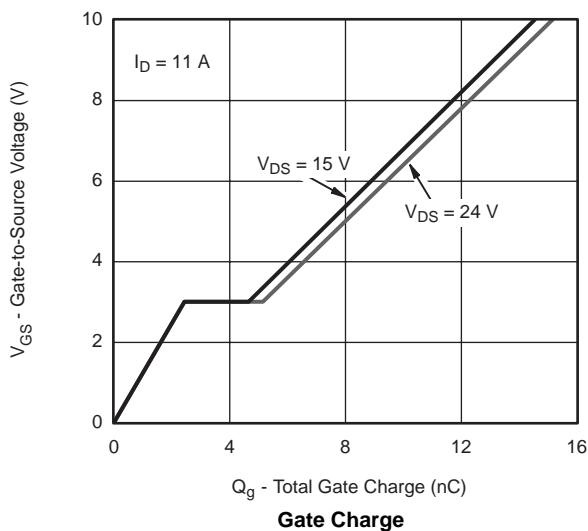
**Transfer Characteristics**



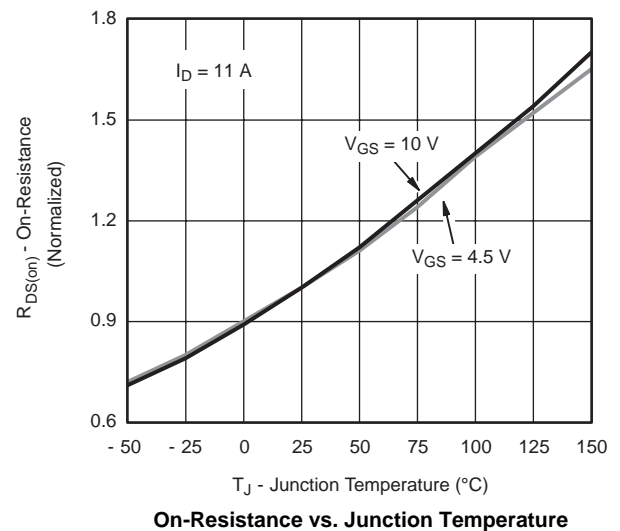
**On-Resistance vs. Drain Current and Gate Voltage**



**Capacitance**

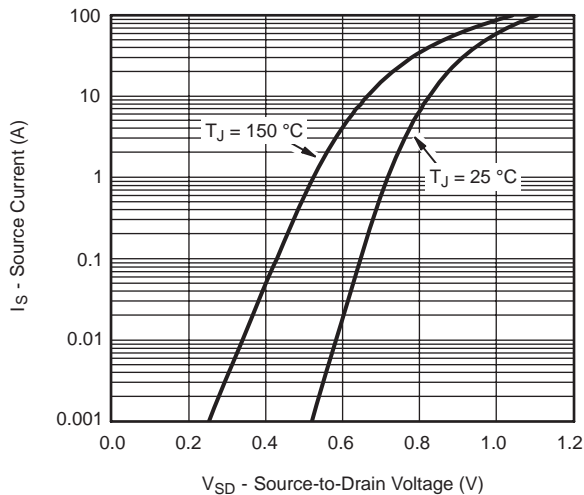


**Gate Charge**

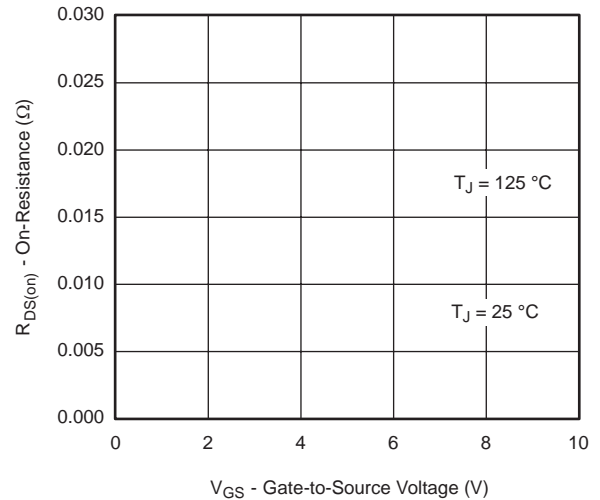


**On-Resistance vs. Junction Temperature**

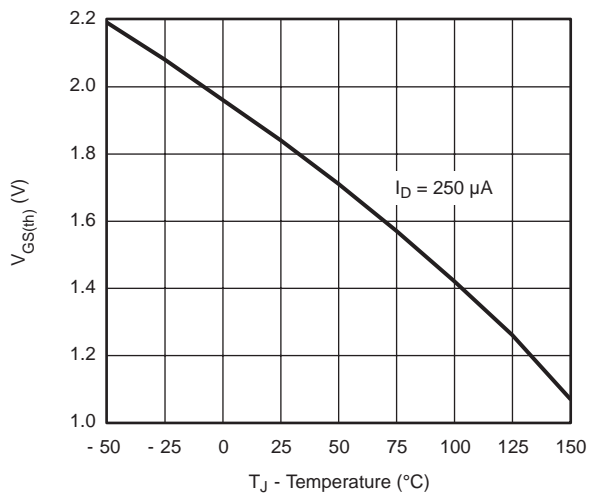
## MOSFET TYPICAL CHARACTERISTICS (25°C, unless otherwise noted)



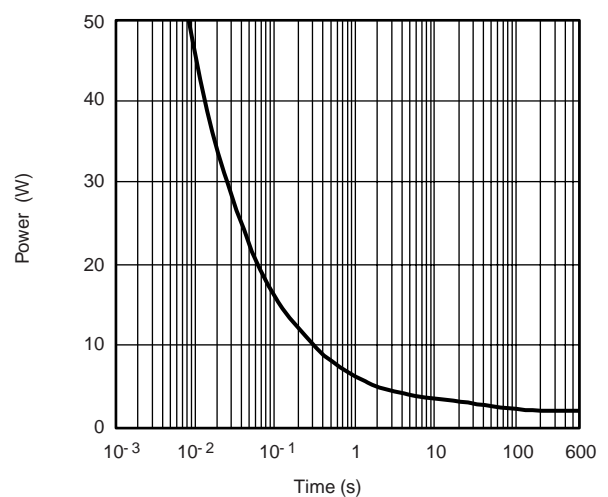
Source-Drain Diode Forward Voltage



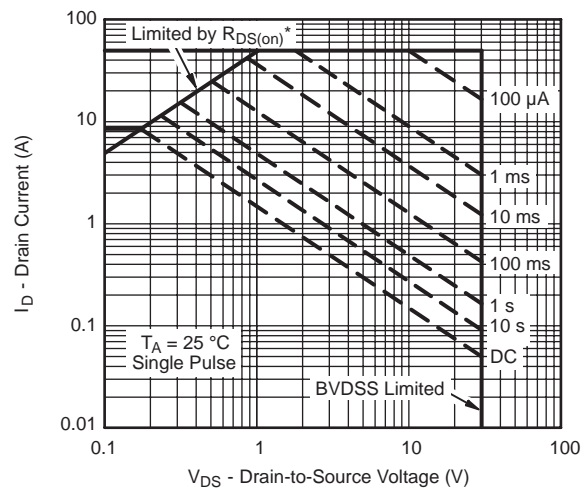
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage



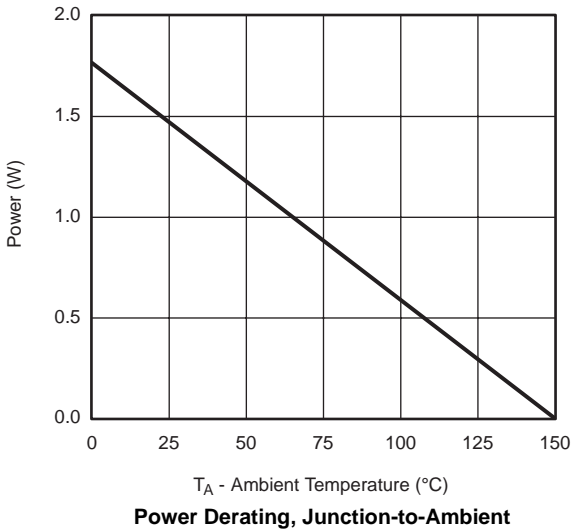
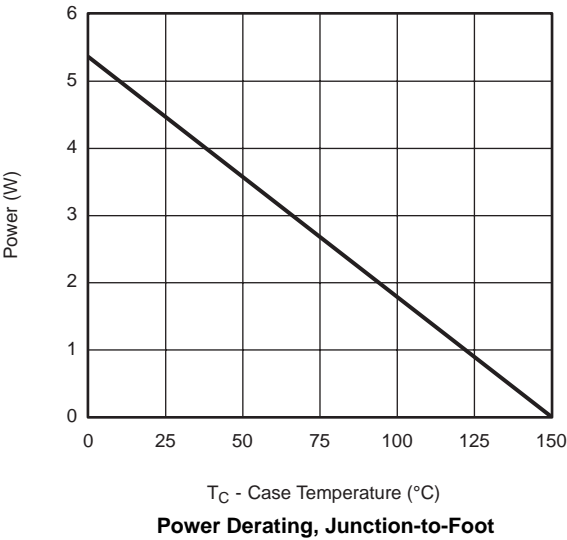
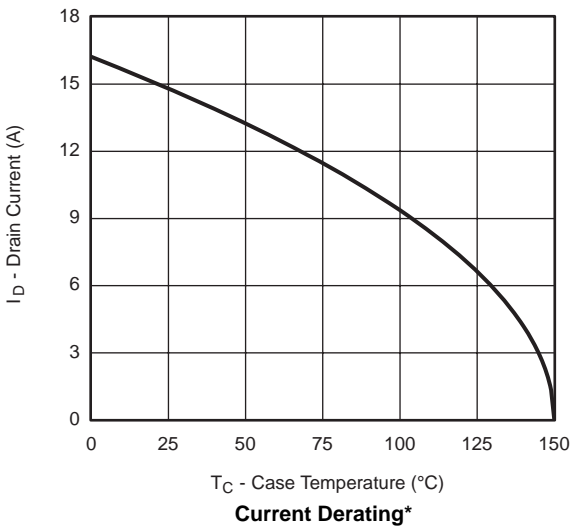
Single Pulse Power, Junction-to-Ambient



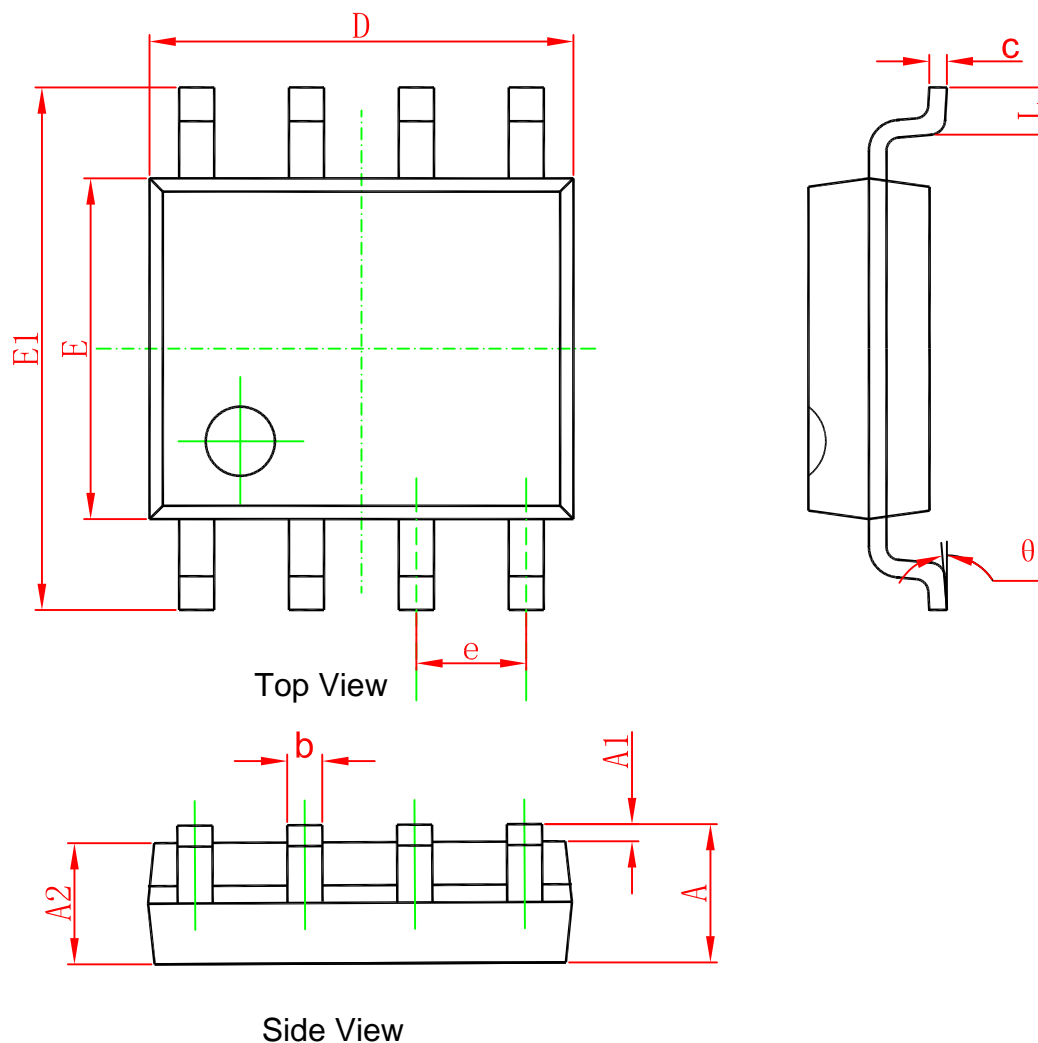
\*  $V_{GS} >$  minimum  $V_{GS}$  at which  $R_{DS(on)}$  is specified

Safe Operating Area, Junction-to-Ambient

**MOSFET TYPICAL CHARACTERISTICS (25°C, unless otherwise noted)**



## SOP-8L Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.006	0.010
D	4.700	5.100	0.185	0.200
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
e	1.270 (BSC)		0.050 (BSC)	
L	0.400	1.270	0.016	0.050
$\theta$	0°	8°	0°	8°