



Micro Commercial Components  
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# SI3415

## P-Channel Enhancement Mode Field Effect Transistor

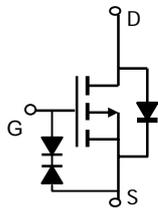
### Features

- Lead Free Finish/RoHS Compliant ("P" Suffix designates RoHS Compliant. See ordering information)
- Epoxy meets UL 94 V-0 flammability rating
- Moisture Sensitivity Level 1
- Excellent  $R_{DS(ON)}$  low gate charge, low gate voltages
- Load switch and in PWM applications
- Halogen free available upon request by adding suffix "-HF"

### Maximum Ratings @ 25°C Unless Otherwise Specified

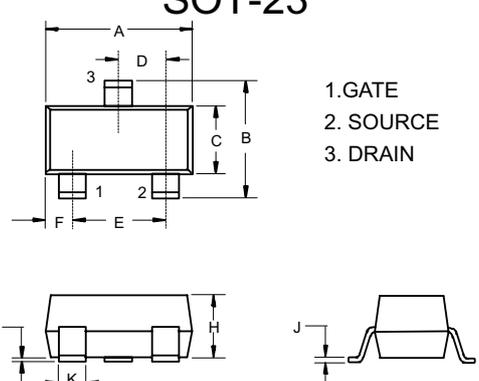
Symbol	Parameter	Rating	Unit
$V_{DS}$	Drain-source Voltage	-20	V
$I_D$	Drain Current-Continuous	-4.0	A
$V_{GS}$	Gate-source Voltage	$\pm 8$	V
$P_D$	Total Power Dissipation	0.35	W
$R_{\theta JA}$	Thermal Resistance Junction to Ambient	357	$^{\circ}C/W$
$T_J$	Operating Junction Temperature	-55 to +150	$^{\circ}C$
$T_{STG}$	Storage Temperature	-55 to +150	$^{\circ}C$

### Internal Block Diagram



Marking: R15 / 3415

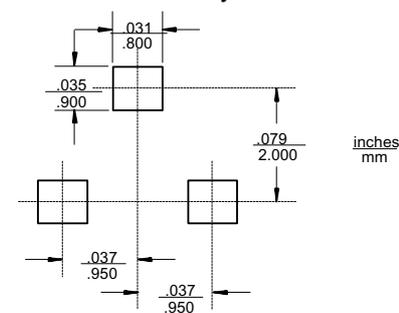
### SOT-23



1. GATE  
 2. SOURCE  
 3. DRAIN

DIM	INCHES		MM		NOTE
	MIN	MAX	MIN	MAX	
A	.110	.120	2.80	3.04	
B	.083	.098	2.10	2.64	
C	.047	.055	1.20	1.40	
D	.035	.041	.89	1.03	
E	.070	.081	1.78	2.05	
F	.018	.024	.45	.60	
G	.0005	.0039	.013	.100	
H	.035	.044	.89	1.12	
J	.003	.007	.085	.180	
K	.015	.020	.37	.51	

### Suggested Solder Pad Layout



inches  
mm

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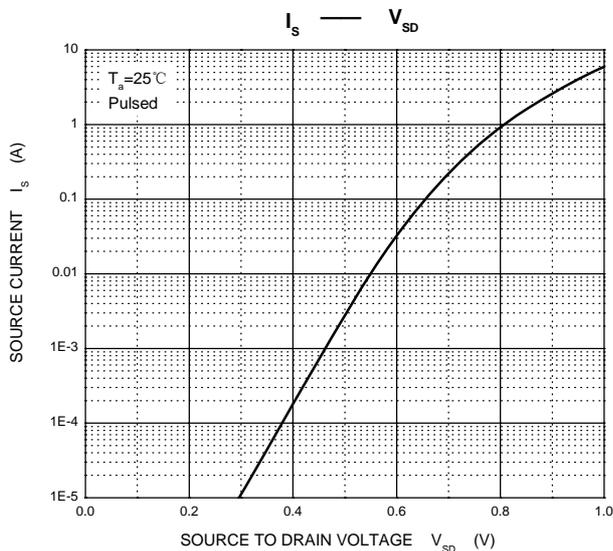
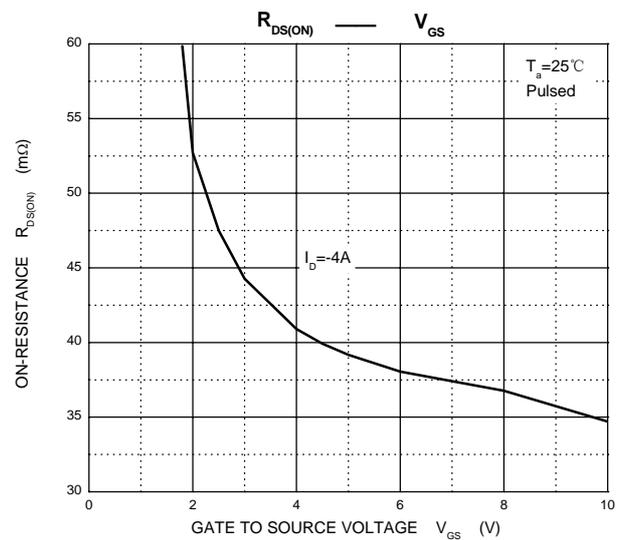
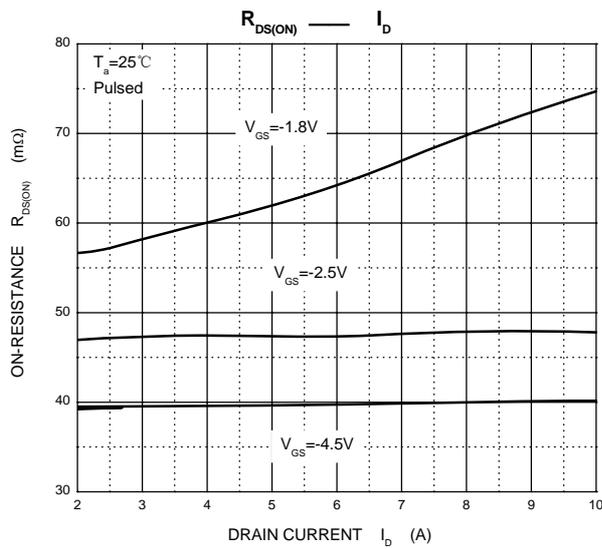
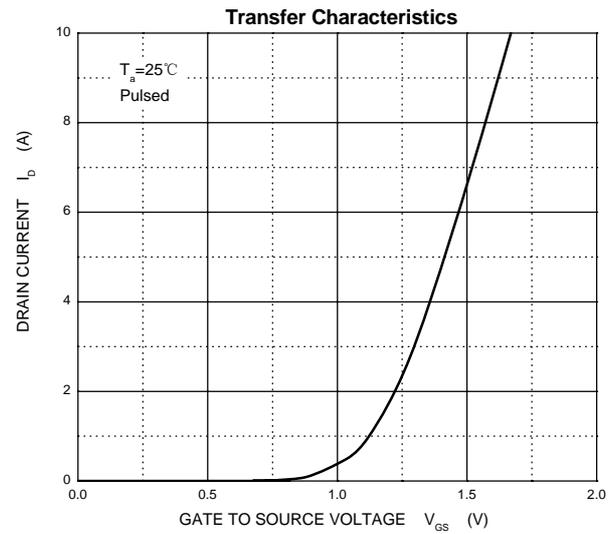
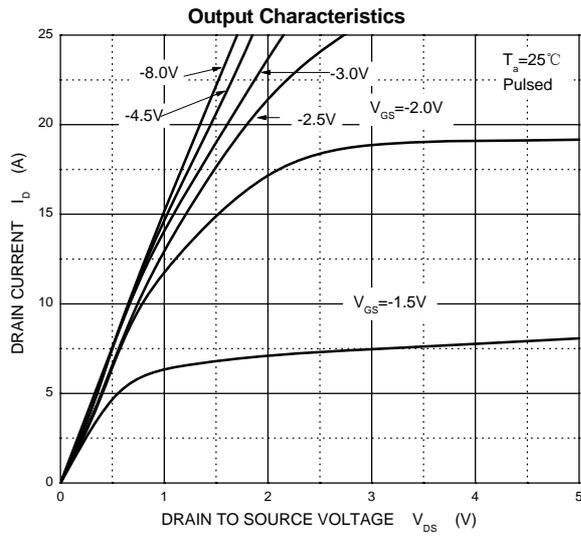
## Electrical characteristics (T<sub>a</sub>=25°C unless otherwise noted)

Parameter	Symbol	Test Condition	Min	Typ	Max	Units
<b>Static Parameters</b>						
Drain-source breakdown voltage	V <sub>(BR) DSS</sub>	V <sub>GS</sub> = 0V, I <sub>D</sub> = -250μA	-20			V
Gate threshold voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = -250μA	-0.3		-1	
Gate-body leakage current	I <sub>GSS</sub>	V <sub>DS</sub> = 0V, V <sub>GS</sub> = ±8V			±10	μA
		V <sub>DS</sub> = 0V, V <sub>GS</sub> = ±4.5V			±1	
Zero gate voltage drain current	I <sub>DSS</sub>	V <sub>DS</sub> = -16V, V <sub>GS</sub> = 0V			-1	
Drain-source on-state resistance(note1)	R <sub>DS(on)</sub>	V <sub>GS</sub> = -4.5V, I <sub>D</sub> = -4A			0.050	Ω
		V <sub>GS</sub> = -2.5V, I <sub>D</sub> = -4A			0.060	
		V <sub>GS</sub> = -1.8V, I <sub>D</sub> = -2A			0.073	
Forward transconductance(note2)	g <sub>FS</sub>	V <sub>DS</sub> = -5V, I <sub>D</sub> = -4A	8			S
Body diode voltage(note2)	V <sub>SD</sub>	I <sub>S</sub> = -1A, V <sub>GS</sub> = 0V			-1	V
<b>Dynamic Parameters (note3)</b>						
Input capacitance	C <sub>iss</sub>	V <sub>DS</sub> = -10V, V <sub>GS</sub> = 0V, f = 1MHz		1450		pF
Output capacitance	C <sub>oss</sub>			205		
Reverse transfer capacitance	C <sub>rss</sub>			160		
Gate resistance	R <sub>g</sub>	V <sub>DS</sub> = 0V, V <sub>GS</sub> = 0V, f = 1MHz		6.5		Ω
<b>Switching Parameters</b>						
Total gate charge	Q <sub>g</sub>	V <sub>DS</sub> = -10V, V <sub>GS</sub> = -4.5V, I <sub>D</sub> = -4A		17.2		nC
Gate-Source charge	Q <sub>gs</sub>			1.3		
Gate-drain charge	Q <sub>gd</sub>			4.5		
Turn-on delay time (note3)	t <sub>d(on)</sub>	V <sub>DS</sub> = -10V, V <sub>GS</sub> = -4.5V R <sub>GEN</sub> = 3Ω, R <sub>L</sub> = 2.5Ω,		9.5		ns
Turn-on rise time(note3)	t <sub>r</sub>			17		
Turn-off delay time(note3)	t <sub>d(off)</sub>			94		
Turn-off fall time(note3)	t <sub>f</sub>			35		

### Notes:

1. Repetitive rating, pulse width limited by junction temperature.
2. Pulse Test : Pulse width ≤ 300μs, duty cycle ≤ 2%.
3. These parameters have no way to verify.

## Typical characteristics





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Ordering Information :

Device	Packing
Part Number-TP	Tape&Reel: 3Kpcs/Reel

Note : Adding "-HF" suffix for halogen free, eg. Part Number-TP-HF

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