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With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!



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# SI2333

## Features

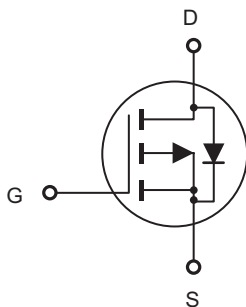
- Halogen free available upon request by adding suffix "-HF"
- TrenchFET Power Mosfet
- Excellent  $R_{DS(ON)}$
- Marking Code: S33
- Epoxy meets UL 94 V-0 flammability rating
- Moisture Sensitivity Level 1

## Maximum Ratings @ 25 C Unless Otherwise Specified

Symbol	Parameter	Rating	Unit
$V_{DS}$	Drain-source Voltage	-12	V
$I_D$	Drain Current-Continuous <sup>(1)</sup>	-6	A
$I_{DM}$	Drain Current-Pulsed	-20	A
$V_{GS}$	Gate-source Voltage	$\pm 8$	V
$P_D$	Total Power Dissipation	0.35 <sup>(2)</sup>	W
		1.1 <sup>(1)</sup>	W
$R_{\theta JA}$	Thermal Resistance from Junction to Ambient	357 <sup>(2)</sup>	$^{\circ}C/W$
		113 <sup>(1)</sup>	$^{\circ}C/W$
$T_J$	Operating Junction Temperature	-55 to +150	$^{\circ}C$
$T_{STG}$	Storage Temperature	-55 to +150	$^{\circ}C$

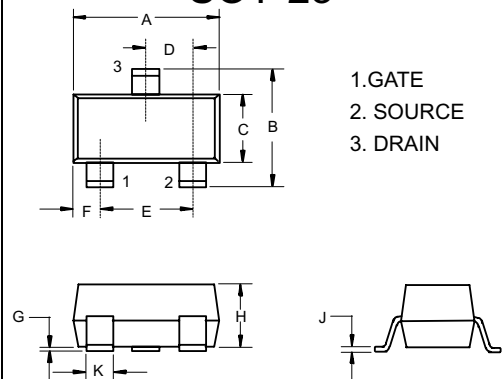
NOTE 1. Device mounted on FR-4 substrate board, with minimum recommended pad layout, single side.  
2. Device mounted on no heat sink.

## Internal Block Diagram



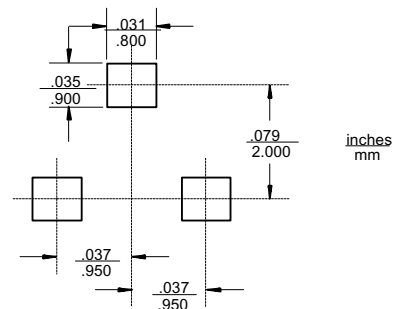
## P-Channel Enhancement Mode Field Effect Transistor

### SOT-23



DIM	INCHES		MM		NOTE
	MIN	MAX	MIN	MAX	
A	.110	.120	2.80	3.04	
B	.083	.104	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



# SI2333

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

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
<b>Static Characteristics</b>						
Drain-source breakdown voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> = 0V, I <sub>D</sub> = -250μA	-12			V
Zero gate voltage drain current	I <sub>DSS</sub>	V <sub>DS</sub> = -12V, V <sub>GS</sub> = 0V			-1	μA
Gate-body leakage current	I <sub>GSS</sub>	V <sub>GS</sub> = ±8V, V <sub>DS</sub> = 0V			±0.1	
Gate threshold voltage (note 3)	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = -250μA	-0.4		-1	V
Drain-source on-resistance (note 4)	R <sub>DS(on)</sub>	V <sub>GS</sub> = -4.5V, I <sub>D</sub> = -5A			28	mΩ
		V <sub>GS</sub> = -3.7V, I <sub>D</sub> = -4.6A			32	
		V <sub>GS</sub> = -2.5V, I <sub>D</sub> = -4.3A			40	
		V <sub>GS</sub> = -1.8V, I <sub>D</sub> = -1A			63	
		V <sub>GS</sub> = -1.5V, I <sub>D</sub> = -0.5A			150	
Forward transconductance (note 3)	g <sub>FS</sub>	V <sub>DS</sub> = -5V, I <sub>D</sub> = -5A		18		S
<b>Dynamic characteristics (note 4)</b>						
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> = -6V, V <sub>GS</sub> = 0V, f = 1MHz		1275		pF
Output Capacitance	C <sub>oss</sub>			255		pF
Reverse Transfer Capacitance	C <sub>rss</sub>			236		pF
Gate resistance	R <sub>g</sub>	f = 1MHz	1.9		19	Ω
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> = -6V, V <sub>GS</sub> = -4.5V, I <sub>D</sub> = -5A		14	2	nC
Gate-Source Charge	Q <sub>gs</sub>			2.3		nC
Gate-Drain Charge	Q <sub>gd</sub>			3.6		nC
Turn-on delay time	t <sub>d(on)</sub>	V <sub>DD</sub> = -6V, V <sub>GEN</sub> = -4.5V, I <sub>D</sub> = -4A R <sub>L</sub> = 6Ω, R <sub>GEN</sub> = 1Ω		26	4	ns
Turn-on rise time	t <sub>r</sub>			24	4	ns
Turn-off delay time	t <sub>d(off)</sub>			45	7	ns
Turn-off fall time	t <sub>f</sub>			20	3	ns
<b>Source-Drain Diode characteristics</b>						
Diode forward current	I <sub>S</sub>	T <sub>C</sub> = 25°C			-1.4	A
Diode pulsed forward current	I <sub>SM</sub>				-20	A
Diode Forward voltage (note 3)	V <sub>DS</sub>	V <sub>GS</sub> = 0V, I <sub>S</sub> = -4A			-1.2	V
Diode reverse recovery time (note 4)	t <sub>rr</sub>	I <sub>F</sub> = -4A, dI/dt = 100A/μs		24	48	ns
Diode reverse recovery charge (note 4)	Q <sub>rr</sub>			8	16	nC

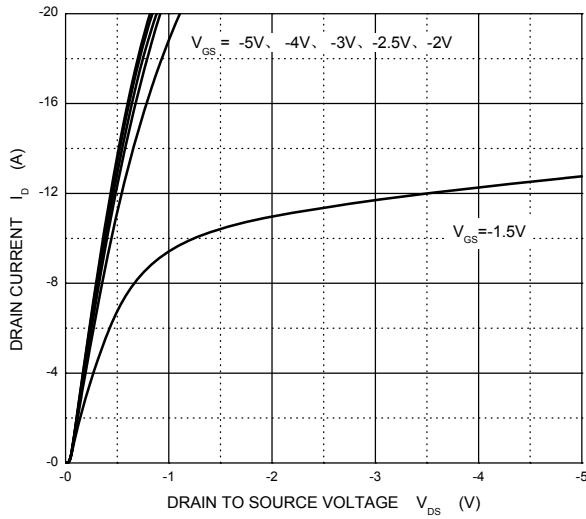
**Notes :** 3. Pulse test; pulse width ≤ 300μs, duty cycles ≤ 2%.

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

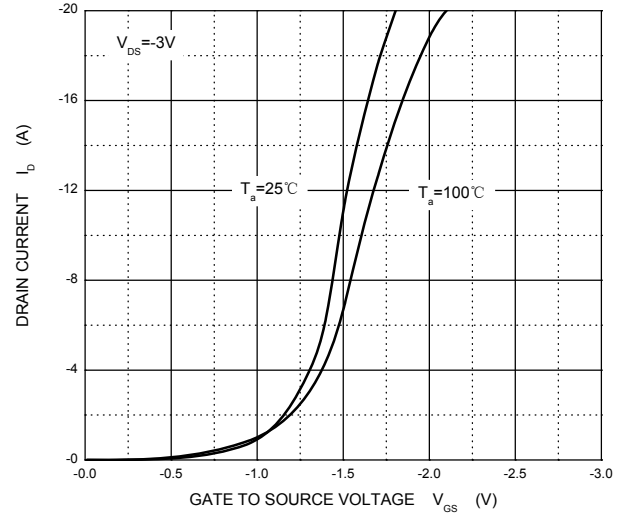


Typical Characteristics

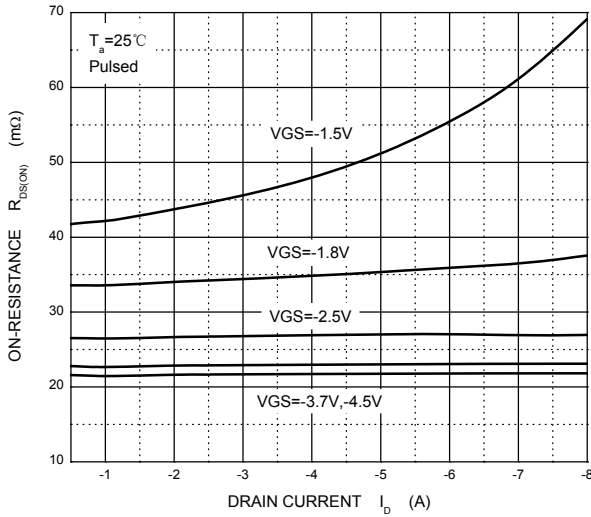
Output Characteristics



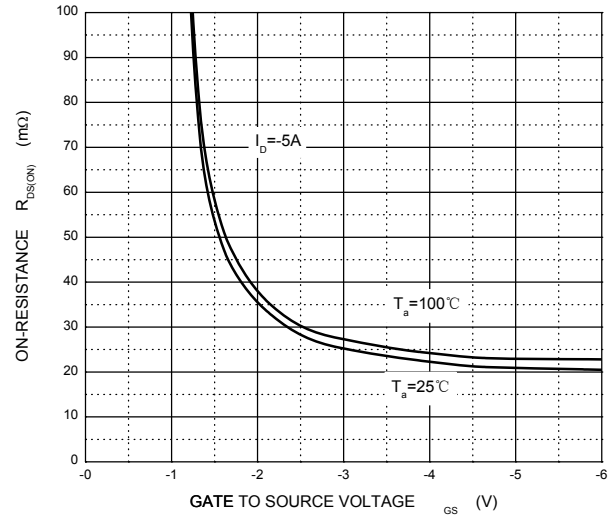
Transfer Characteristics



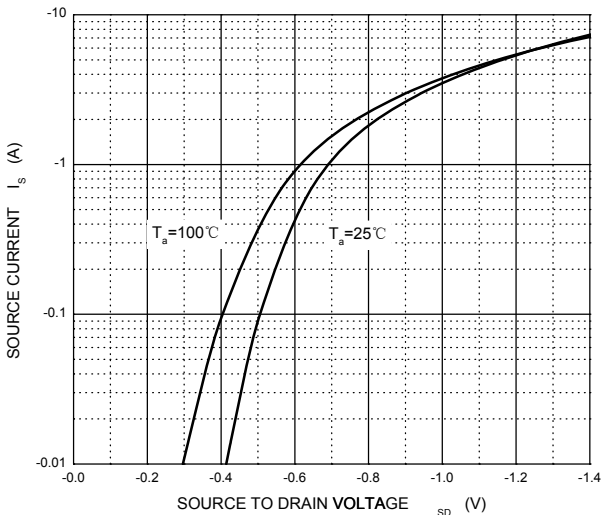
$R_{DS(ON)}$  —  $I_D$



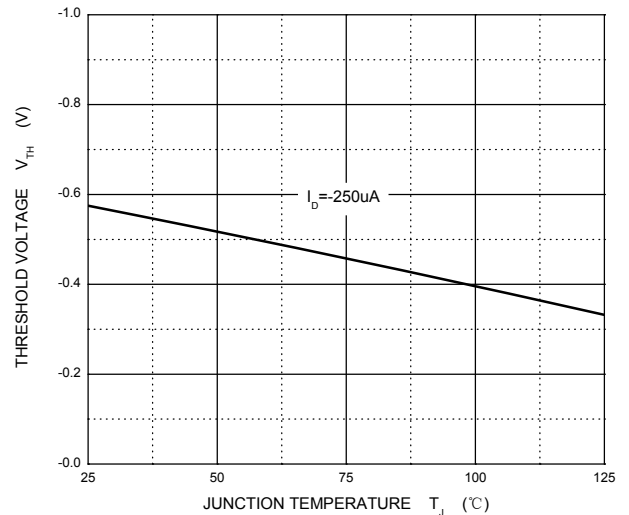
$R_{DS(ON)}$  —  $V_{GS}$



$I_S$  —  $V_{SD}$



Threshold Voltage





Micro Commercial Components

**Ordering Information :**

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

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