



# 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

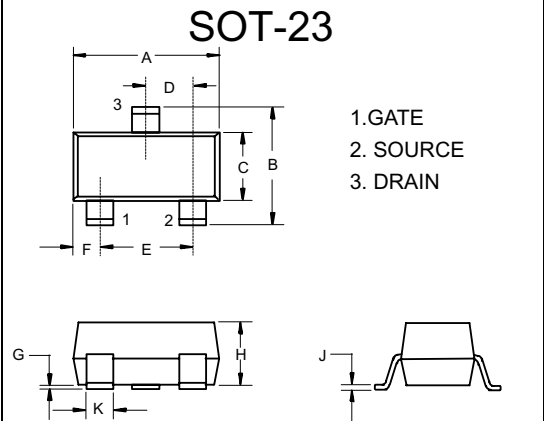
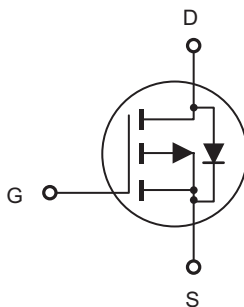
## P-Channel Enhancement Mode Field Effect Transistor

### 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	$^{\circ}C$

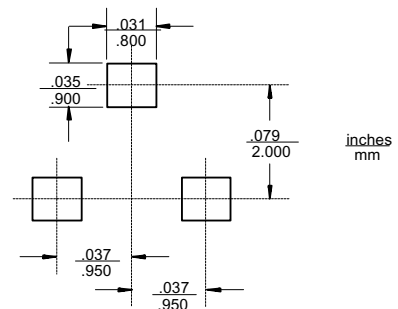
NOTE 1. Device mounted on FR-4 substrate board, with minimum recommended pad layout, single side.  
2. Device mounted on no heat sink.

### Internal Block Diagram



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



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

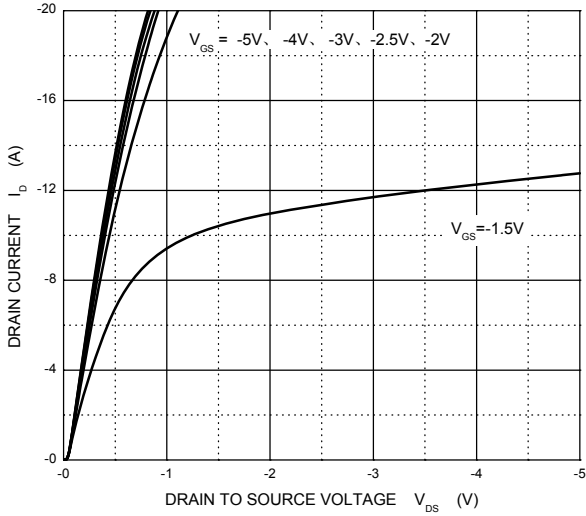
Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
<b>Static Characteristics</b>						
Drain-source breakdown voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> = 0V, I <sub>D</sub> = -250μA	-12			V
Zero gate voltage drain current	I <sub>DSS</sub>	V <sub>DS</sub> = -12V, V <sub>GS</sub> = 0V			-1	μA
Gate-body 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	21	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	40	ns
Turn-on rise time	t <sub>r</sub>			24	40	ns
Turn-off delay time	t <sub>d(off)</sub>			45	70	ns
Turn-off fall time	t <sub>f</sub>			20	35	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%.

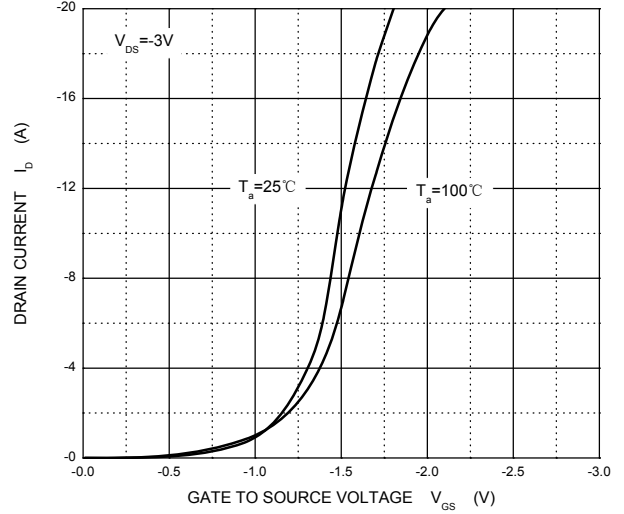
4. Guaranteed by design, not subject to production testing.

**Typical Characteristics**

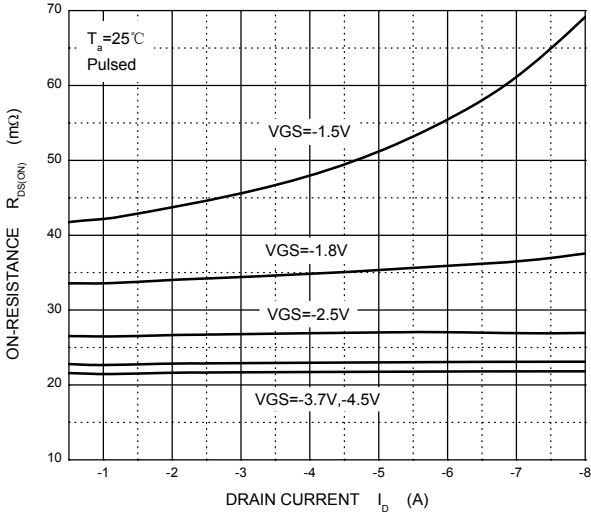
**Output Characteristics**



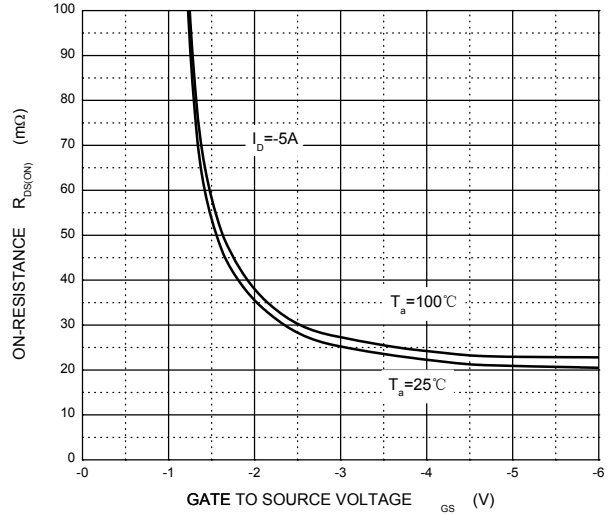
**Transfer Characteristics**



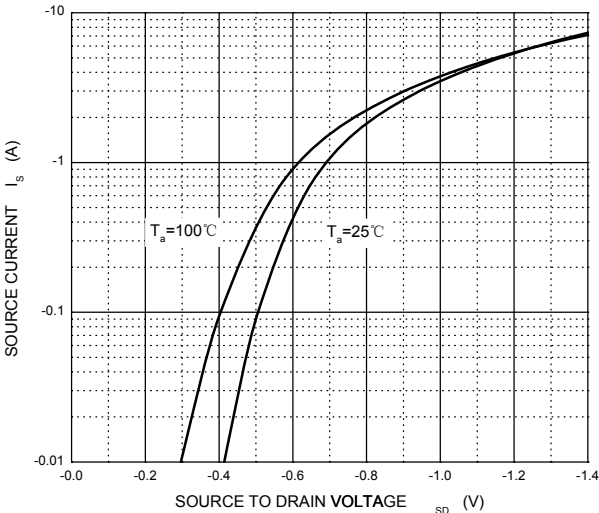
**$R_{DS(ON)}$  —  $I_D$**



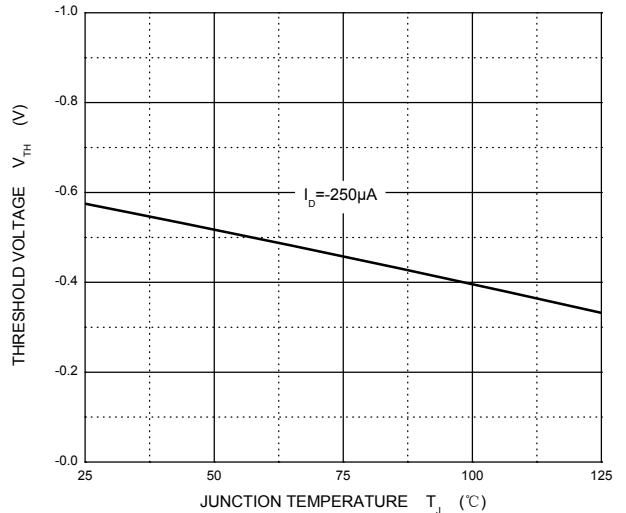
**$R_{DS(ON)}$  —  $V_{GS}$**



**$I_S$  —  $V_{SD}$**



**Threshold Voltage**





Micro Commercial Components

**Ordering Information :**

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

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