



Micro Commercial Components



Micro Commercial Components
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SI2300

Features

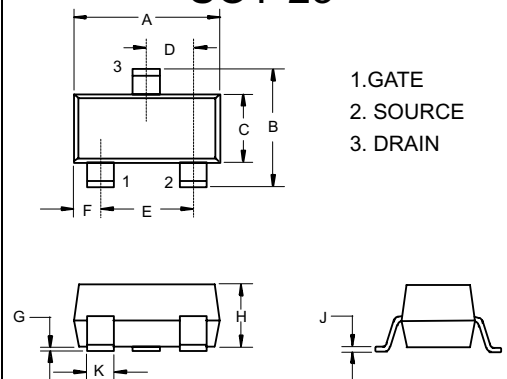
- Halogen free available upon request by adding suffix "-HF"
- 20V,4.5A, $R_{DS(ON)} < 25m\Omega$ @ $V_{GS}=4.5V$
 $R_{DS(ON)} < 35m\Omega$ @ $V_{GS}=2.5V$
- High dense cell design for extremely low $R_{DS(ON)}$
- Rugged and reliable
- Lead free product is acquired
- SOT-23 Package
- Epoxy meets UL 94 V-0 flammability rating
- Moisture Sensitivity Level 1

Maximum Ratings @ 25°C Unless Otherwise Specified

Symbol	Parameter	Rating	Unit
V_{DS}	Drain-source Voltage	20	V
I_D	Drain Current-Continuous	4.5	A
V_{GS}	Gate-source Voltage	± 10	V
P_D	Total Power Dissipation	1	W
$R_{\theta JA}$	Thermal Resistance Junction to Ambient ^b	125	°C/W
T_J	Operating Junction Temperature	-55 to +150	°C
T_{STG}	Storage Temperature	-55 to +150	°C

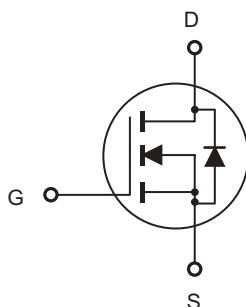
N-Channel Enhancement Mode Field Effect Transistor

SOT-23

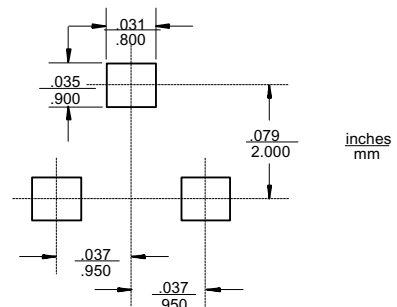


DIM	INCHES		MM		NOTE
	MIN	MAX	MIN	MAX	
A	.110	.120	2.80	3.04	
B	.083	.104	2.10	2.64	
C	.047	.055	1.20	1.40	
D	.035	.041	.89	1.03	
E	.070	.081	1.78	2.05	
F	.018	.024	.45	.60	
G	.0005	.0039	.013	.100	
H	.035	.044	.89	1.12	
J	.003	.007	.085	.180	
K	.015	.020	.37	.51	

Internal Block Diagram



Suggested Solder Pad Layout



■ **Electrical Characteristics** ($T_A=25^{\circ}\text{C}$ unless otherwise specified)

Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
Static Characteristics						
Drain-source breakdown voltage	V _{(BR)DSS}	V _{GS} = 0V, I _D =250μA	20			V
Zero gate voltage drain current	I _{DSS}	V _{DS} =20V, V _{GS} =0V			1	μA
Gate-body leakage current	I _{GSS}	V _{GS} = ± 10V, V _{DS} =0V			± 100	nA
Gate threshold voltage*	V _{GS(th)}	V _{DS} = V _{GS} , I _D =250μA	0.5	0.7	0.9	V
Drain-source on-resistance*	R _{DS(ON)}	V _{GS} = 4.5V, I _D =4.5A		19.5	25	mΩ
		V _{GS} = 2.5V, I _D =4.0A		25	38	
Forward Transconductance	g _{FS}	V _{DS} = 5V, I _D =4.5A	5			s
Dynamic Characteristics **						
Input Capacitance	C _{iss}	VDS=10V, VGS=0V, f=1MHZ		482		pF
Output Capacitance	C _{oss}			85		
Reverse Transfer Capacitance	C _{rss}			52		
Switching Characteristics**						
Turn-on delay time	t _{d(on)}	V _{DD} =10V, V _{GS} =4.5V, RL=2.8Ω, I _D =1A, R _{GEN} =6Ω		13		ns
Turn-on rise time	t _r			54		
Turn-off delay time	t _{d(off)}			18		
Turn-off Fall time	t _f			11		
Total Gate Charge	Q _g	V _{DS} =10V, I _D =4.5A, V _{GS} =4.5V		4.2		nC
Gate-Source Charge	Q _{gs}			0.9		
Gate-Drain Charge	Q _{gd}			1.4		
Source-Drain Diode characteristics						
Drain-Source Diode Forward Current	I _S				4.5	A
Diode Forward voltage	V _{SD}	V _{GS} =0V, I _S =4.5A		0.8	1.2	V

Notes:

*Pulse Test: Pulse Width $\leq 300\mu A$, Duty Cycle $\leq 2\%$.

**These parameters have no way to verify.

■ **Characteristics (Typical)**

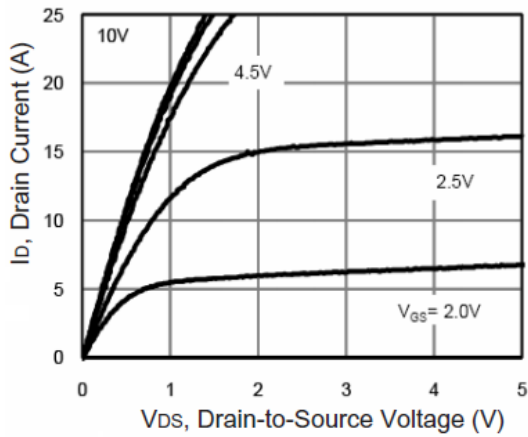


Figure 1. Output Characteristics

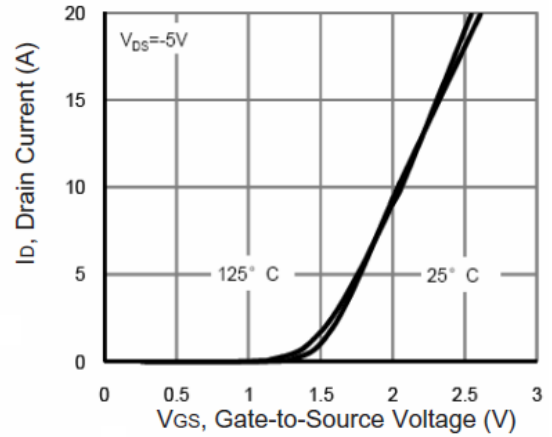


Figure 2. Transfer Characteristics

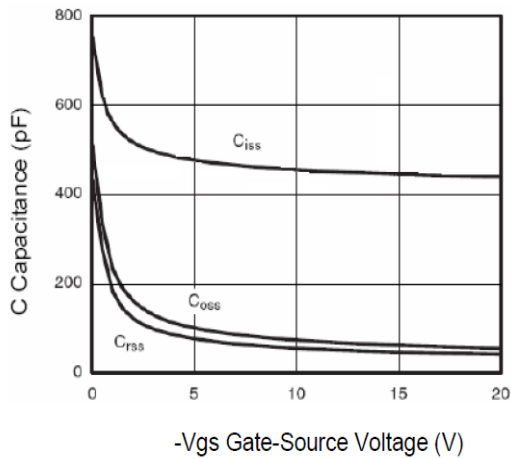


Figure 3. Capacitance

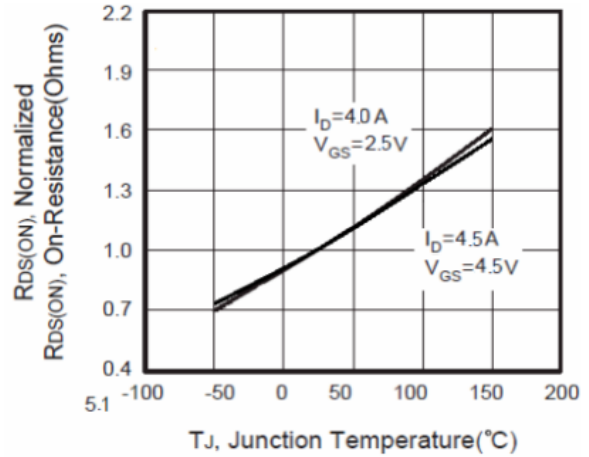


Figure 4. On-Resistance Variation with Temperature

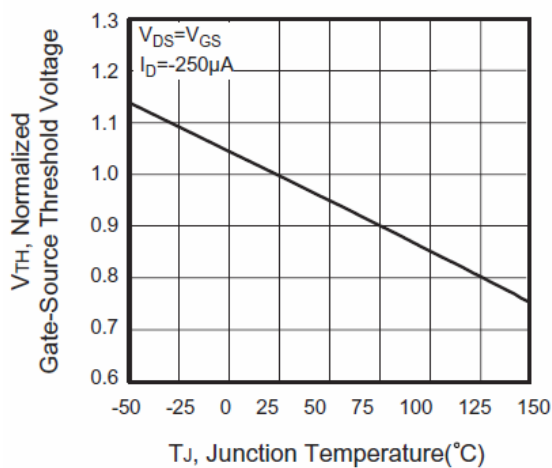


Figure 5. Gate Threshold Variation with Temperature

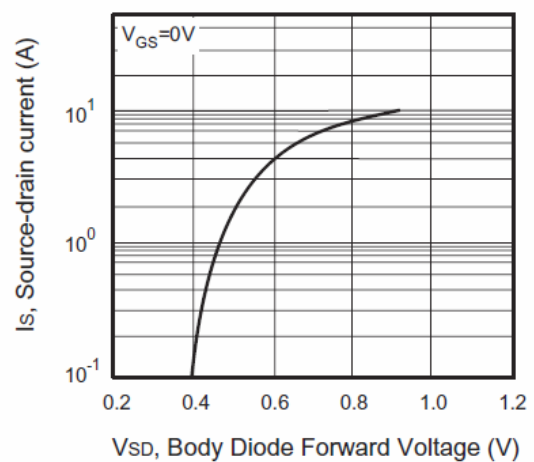


Figure 6. Body Diode Forward Voltage Variation with Source Current

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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