



THE DATASHEET OF SI2304-TP



SI2304

N-Channel Enhancement Mode Field Effect Transistor

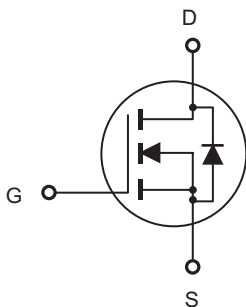
Features

- Halogen free available upon request by adding suffix "-HF"
- 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
- 30V,2.5A, $R_{DS(ON)}=65m\Omega @V_{GS}=10V$
 30V,2.0A, $R_{DS(ON)}=90m\Omega @V_{GS}=4.5V$
- High dense cell design for extremely low $R_{DS(ON)}$
- Rugged and reliable
- Lead free product is acquired
- SOT-23 Package
- Marking Code: S4

Maximum Ratings @ 25°C Unless Otherwise Specified

Symbol	Parameter	Rating	Unit
V_{DS}	Drain-source Voltage	30	V
I_D	Drain Current-Continuous	2.5	A
I_{DM}	Drain Current-Pulsed	10	A
V_{GS}	Gate-source Voltage	± 20	V
P_D	Total Power Dissipation	0.25	W
$R_{\theta JA}$	Thermal Resistance Junction to Ambient	500	$^{\circ}C/W$
T_J	Operating Junction Temperature	-55 to +150	$^{\circ}C$
T_{STG}	Storage Temperature	-55 to +150	$^{\circ}C$

Internal Block Diagram



SOT-23

1. GATE
2. SOURCE
3. DRAIN

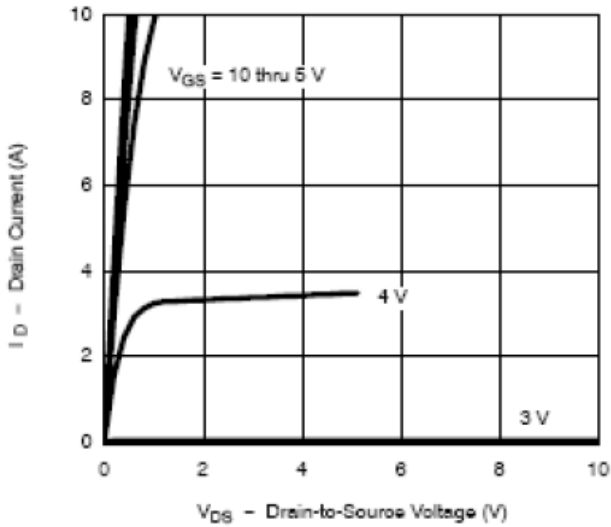
DIM	INCHES		MM		NOTE
	MIN	MAX	MIN	MAX	
A	.110	.120	2.80	3.04	
B	.083	.104	2.10	2.64	
C	.047	.055	1.20	1.40	
D	.035	.041	.89	1.03	
E	.070	.081	1.78	2.05	
F	.018	.024	.45	.60	
G	.0005	.0039	.013	.100	
H	.035	.044	.89	1.12	
J	.003	.007	.085	.180	
K	.015	.020	.37	.51	

Suggested Solder Pad Layout

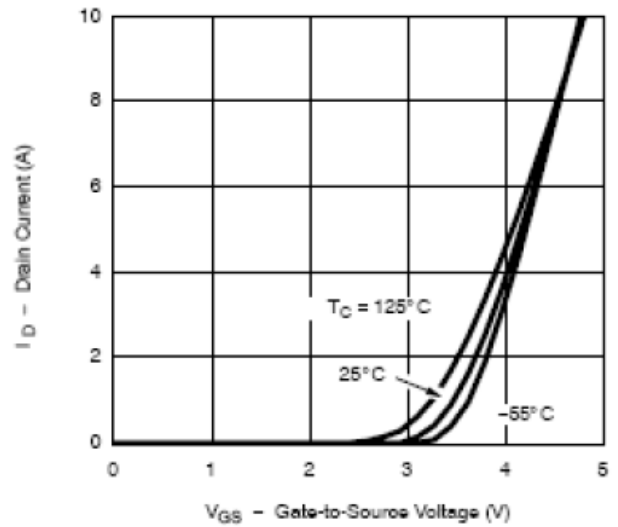
**Electrical Characteristics** $T_A = 25^\circ\text{C}$ unless otherwise noted

Parameter	Symbol	Test Condition	Min	Typ	Max	Units
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS} = 0V, I_D = 250\mu A$	30			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 30V, V_{GS} = 1V$			1	μA
Gate Body Leakage Current, Forward	I_{GSSF}	$V_{GS} = 20V, V_{DS} = 0V$			100	nA
Gate Body Leakage Current, Reverse	I_{GSSR}	$V_{GS} = -20V, V_{DS} = 0V$			-100	nA
On Characteristics						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{GS} = V_{DS}, I_D = 250\mu A$	1		3	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 2.5A$			65	$m\Omega$
		$V_{GS} = 4.5V, I_D = 2A$			90	$m\Omega$
Forward Transconductance	g_{FS}	$V_{DS} = 4.5V, I_D = 2.5A$		4.6		S
Dynamic Characteristics						
Input Capacitance	C_{iss}	$V_{DS} = 15V, V_{GS} = 0V,$ $f = 1.0\text{ MHz}$		240		pF
Output Capacitance	C_{oss}			110		pF
Reverse Transfer Capacitance	C_{rss}			17		pF
Switching Characteristics						
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = 15V, I_D = 1A,$ $V_{GEN} = 10V, R_G = 6\Omega,$ $R_L = 15\Omega$		8	20	ns
Turn-On Rise Time	t_r			12	30	ns
Turn-Off Delay Time	$t_{d(off)}$			17	35	ns
Turn-Off Fall Time	t_f			8	20	ns
Total Gate Charge	Q_g	$V_{DS} = 15V, I_D = 2.5A,$ $V_{GS} = 10V$		4.5	10	nC
Gate-Source Charge	Q_{gs}			0.8		nC
Gate-Drain Charge	Q_{gd}			1.0		nC
Drain-Source Diode Characteristics and Maximum Ratings						
Drain-Source Diode Forward Voltage	V_{SD}	$V_{GS} = 0V, I_S = 1.25A$			1.2	V

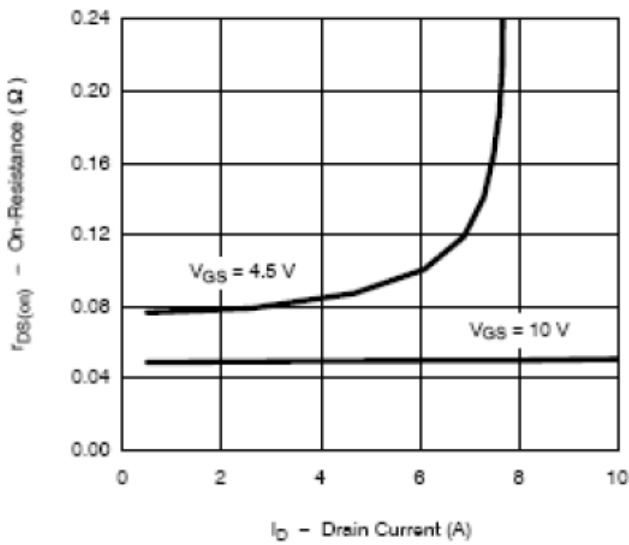
Output Characteristics



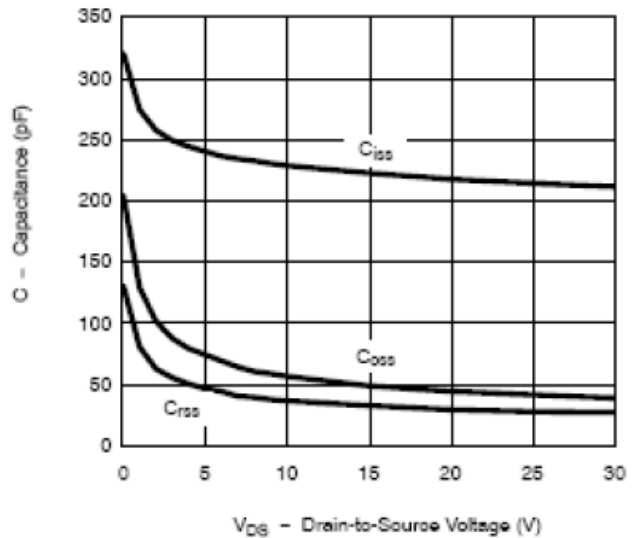
Transfer Characteristics



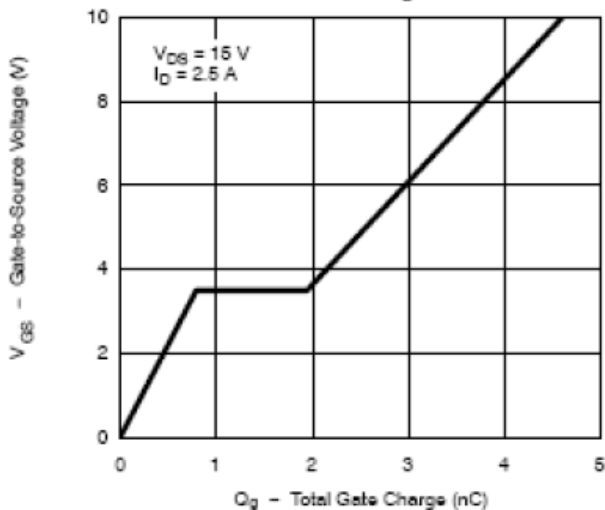
On-Resistance vs. Drain Current



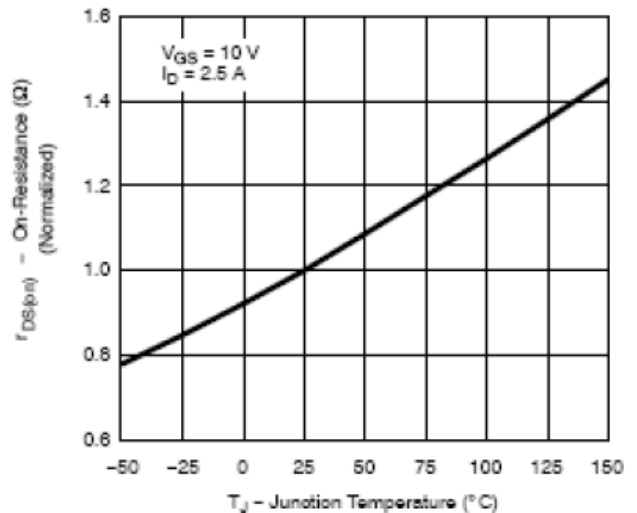
Capacitance

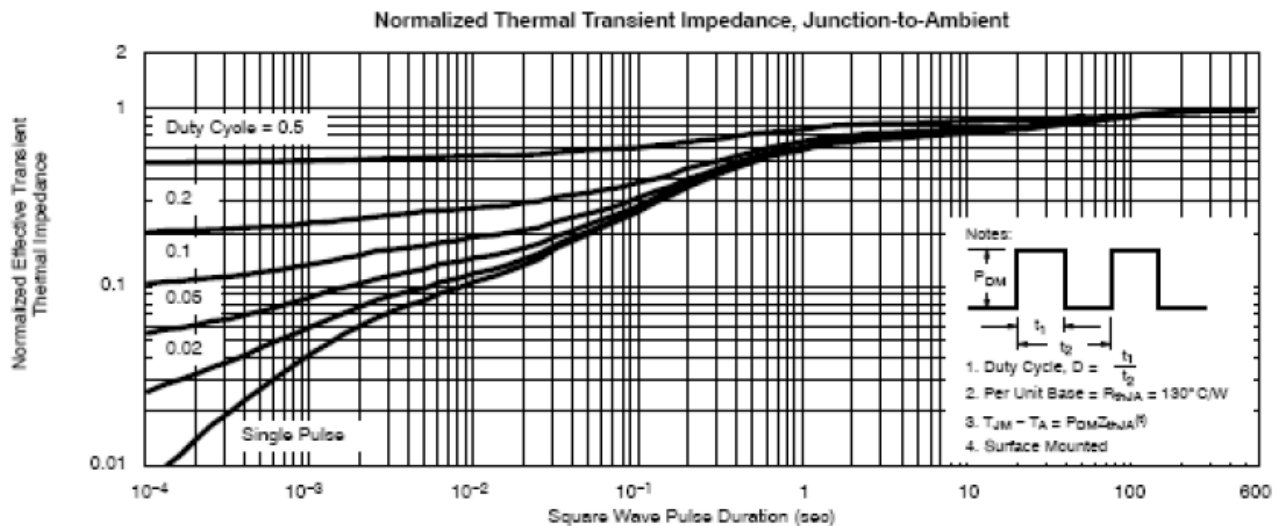
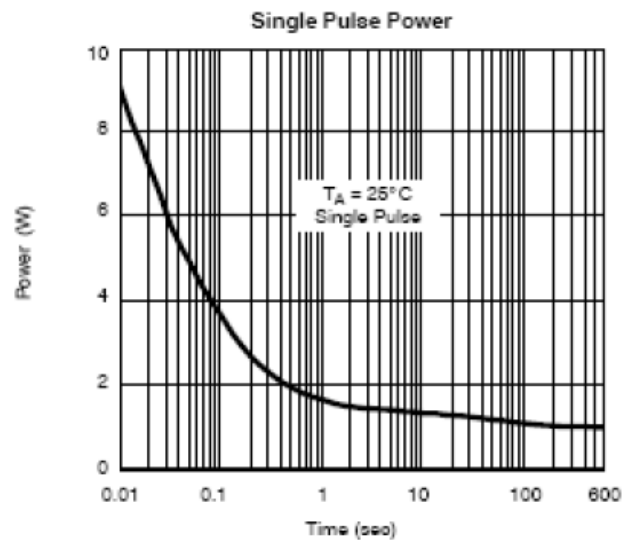
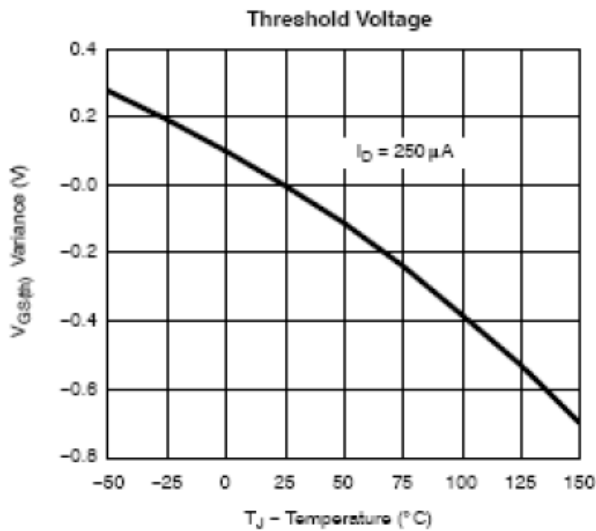
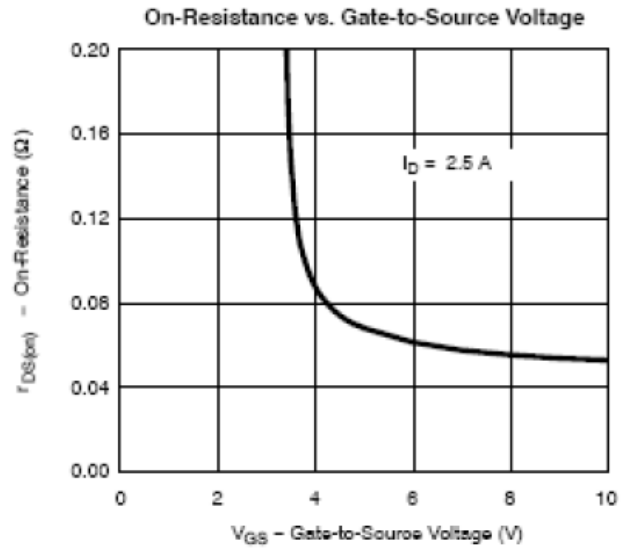
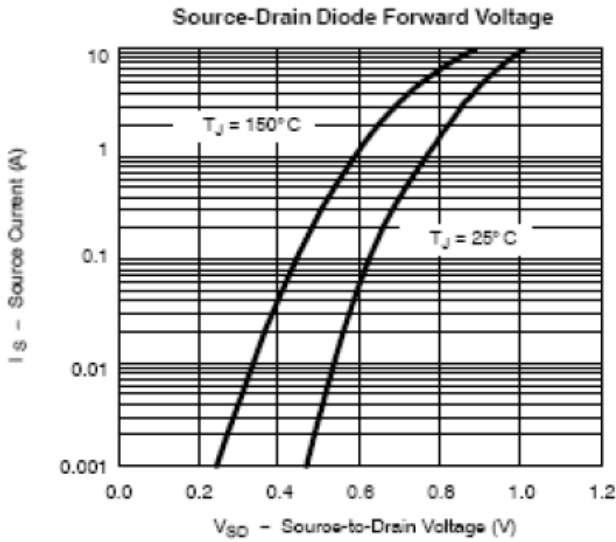


Gate Charge



On-Resistance vs. Junction Temperature







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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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