



Micro Commercial Components



Micro Commercial Components  
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# SI1012

## Features

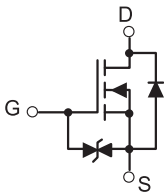
- Lead Free Finish/RoHS Compliant ("P" Suffix designates RoHS Compliant. See ordering information)
- Low Threshold
- ESD Protected Gate
- Epoxy meets UL 94 V-0 flammability rating
- Moisture Sensitivity Level 1
- Halogen free available upon request by adding suffix "-HF"

## Maximum Ratings

- Operating Temperature: -55°C to +150°C
- Storage Temperature: -55°C to +150°C

Parameter	Symbol	Value	Unit
Drain-Source-Voltage	$V_{DSS}$	20	V
Gate-Source-Voltage	$V_{GSS}$	$\pm 12$	V
Continuous Drain Current	$I_{D(DC)}$	0.5	A
Pulsed Drain Current (note1)	$I_{DM(pulse)}$	1.0	
Thermal Resistance	$R_{thJA}$ $R_{thJC}$	833 455	°C/W
Power Dissipation (note2, $T_a=25^\circ\text{C}$ )	$P_D$	150	mW
Maximum Power Dissipation (note3, $T_c=25^\circ\text{C}$ )		275	

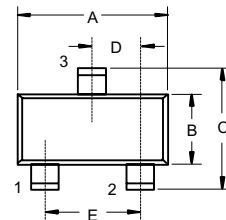
Equivalent circuit



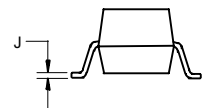
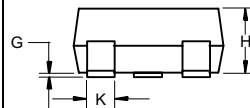
Marking: C

## N-Channel Plastic-Encapsulate Transistor

## SOT-523



1.GATE  
2.SOURCE  
3.DRAIN



DIMENSIONS					
DIM	INCHES		MM		NOTE
	MIN	MAX	MIN	MAX	
A	.059	.067	1.50	1.70	
B	.030	.033	0.75	0.85	
C	.057	.069	1.45	1.75	
D	.020 Nominal		0.50 Nominal		
E	.035	.043	0.90	1.10	
G	.000	.004	.000	.100	
H	.028	.031	.70	0.80	
J	.004	.008	.100	.200	
K	.010	.014	.25	.35	

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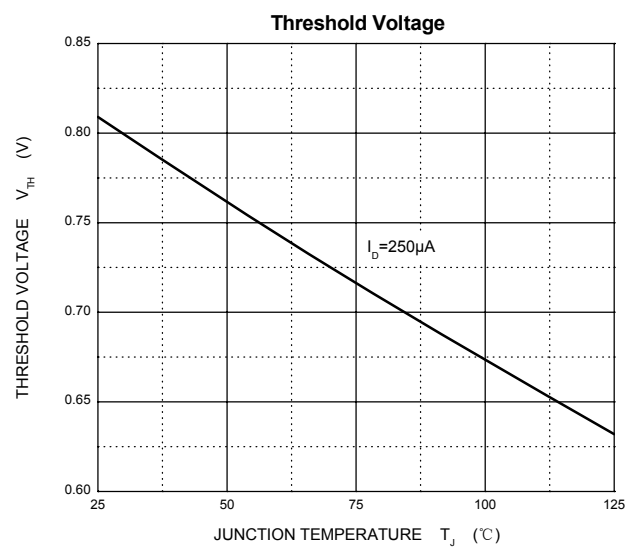
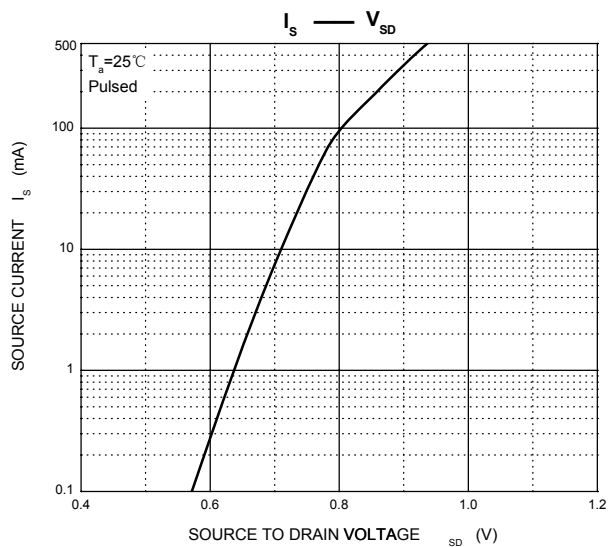
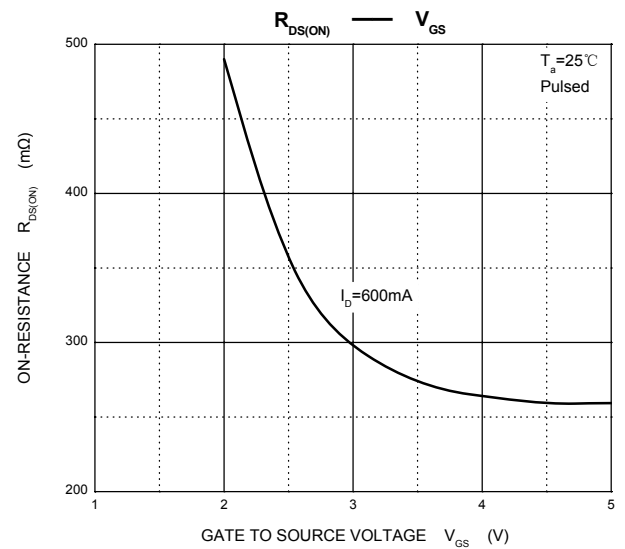
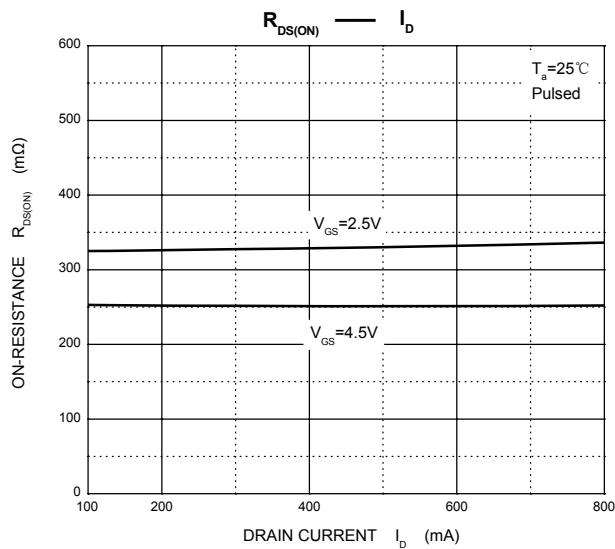
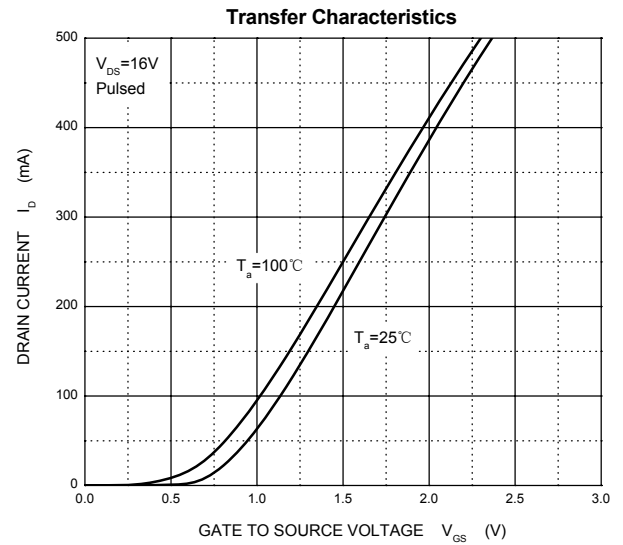
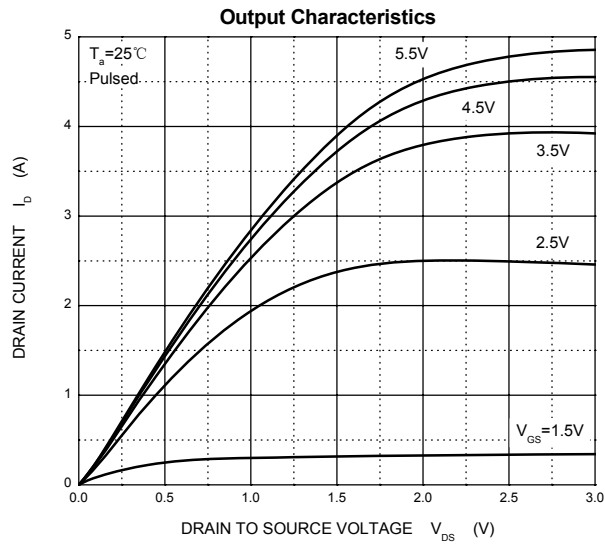
## MOSFET ELECTRICAL CHARACTERISTICS (Ta=25°C unless otherwise specified)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
On/Off States						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 250\mu A$	20			V
Gate-Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	0.45	0.8	1.2	
Gate-Body Leakage Current	$I_{GSS}$	$V_{DS} = 0V, V_{GS} = \pm 4.5V$			$\pm 1$	$\mu A$
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = 16V, V_{GS} = 0V$			100	nA
Drain-Source On-State Resistance	$R_{DS(on)}$	$V_{GS} = 4.5V, I_D = 600mA$		250	700	m $\Omega$
		$V_{GS} = 2.5V, I_D = 500mA$		330	850	
Forward Transconductance	$g_{FS}$	$V_{DS} = 10V, I_D = 400mA$		1		S
Dynamic Characteristics						
Input Capacitance (note 4)	$C_{iss}$	$V_{DS} = 16V, V_{GS} = 0V, f = 1MHz$		100		pF
Output Capacitance (note 4)	$C_{oss}$			16		
Reverse Transfer Capacitance (note 4)	$C_{rss}$			12		
Total Gate Charge	$Q_g$	$V_{DS} = 10V, V_{GS} = 4.5V, I_D = 250mA$		750		nC
Gate-Source Charge	$Q_{gs}$			75		
Gate-Drain Charge	$Q_{gd}$			225		
Switching Times (note 4)						
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = 10V, R_L = 47\Omega, I_D = 200mA, V_{GS} = 4.5V, R_G = 10\Omega$		5		nS
Rise Time	$t_r$			5		
Turn-Off Delay Time	$t_{d(off)}$			25		
Fall Time	$t_f$			11		
Drain-Source Diode Characteristics						
Drain-Source Diode Forward Voltage (note 5)	$V_{SD}$	$I_S = 0.15A, V_{GS} = 0V$			1.2	V

### Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. This test is performed with no heat sink at  $T_a = 25^\circ C$ .
3. This test is performed with infinite heat sink at  $T_c = 25^\circ C$ .
4. These parameters have no way to verify.
5. Pulse Test : Pulse Width  $\leq 300\mu s$ , Duty Cycle  $\leq 0.5\%$ .

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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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