Micro Commercial Components

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SI1012

N-Channel Plastic-Encapsulate Transistor

Features

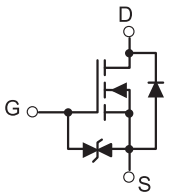
- Lead Free Finish/RoHS Compliant ("P" Suffix designates RoHS Compliant. See ordering information)
- Low Threshold
- ESD Protected Gate
- Epoxy meets UL 94 V-0 flammability rating
- Moisture Sensitivity Level 1
- Halogen free available upon request by adding suffix "-HF"

Maximum Ratings

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

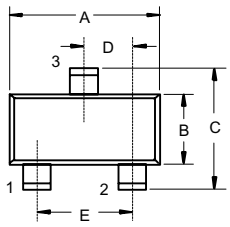
Parameter	Symbol	Value	Unit
Drain-Source-Voltage	V_{DSS}	20	V
Gate-Source-Voltage	V_{GSS}	±12	V
Continuous Drain Current Pulsed Drain Current (note1)	$I_{D(DC)}$ $I_{DM(pulse)}$	0.5 1.0	A
Thermal Resistance	R_{thJA} R_{thJC}	833 455	°C/W
Power Dissipation (note2,Ta=25°C) Maximum Power Dissipation (note3,Tc=25°C)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

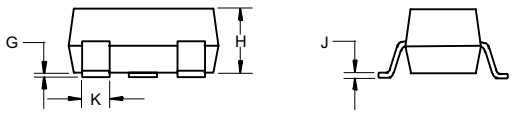
Equivalent circuit



Marking: C

SOT-523





DIMENSIONS					
	INCHES		MM		
DIM	MIN	MAX	MIN	MAX	NOTE
A	.059	.067	1.50	1.70	
B	.030	.033	0.75	0.85	
C	.057	.069	1.45	1.75	
D	.020 Nominal		0.50Nominal		
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℃ 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 =250μA	20			V
Gate-Threshold Voltage	$V_{GS(th)}$	V_{DS} =V_{GS}, I_D =250μA	0.45	0.8	1.2	
Gate-Body Leakage Current	I_{GSS}	V_{DS} =0V, V_{GS} =±4.5V			±1	μA
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	mΩ
		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=47Ω, I_D=200mA, V_{GS}=4.5V,R_G=10Ω		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℃.
3. This test is performed with infinite heat sink at T_c=25℃.
4. These parameters have no way to verify.
5. Pulse Test : Pulse Width≤300μs, Duty Cycle≤0.5%.

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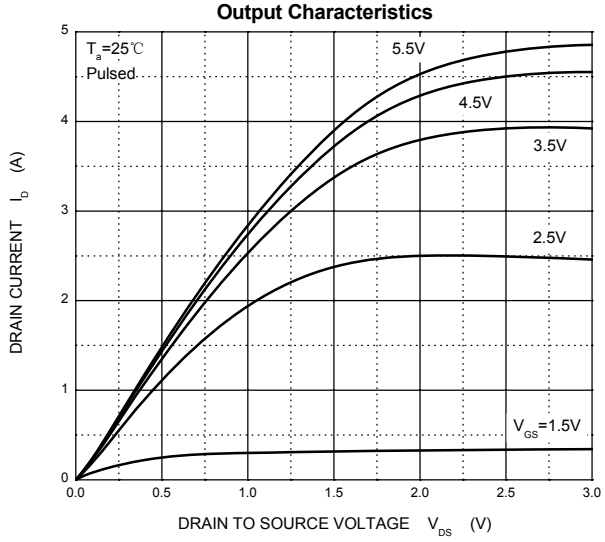
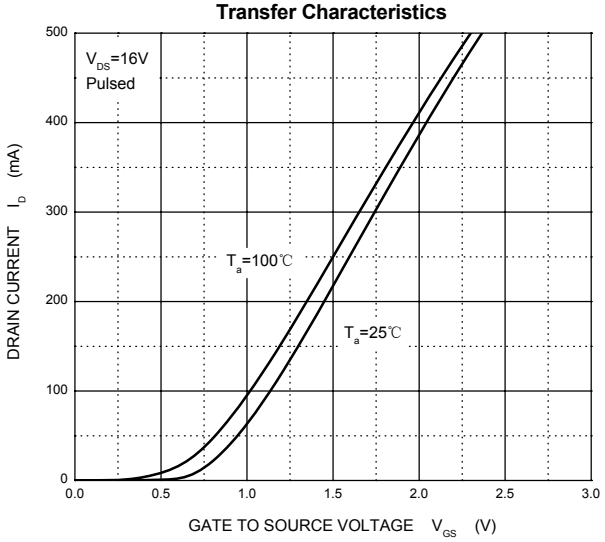
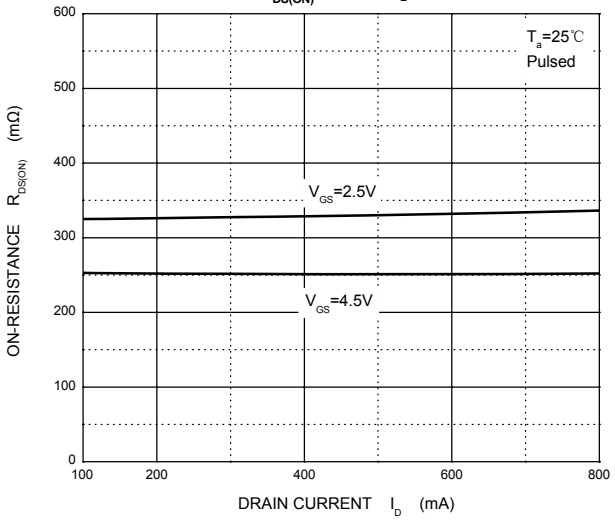
Output Characteristics



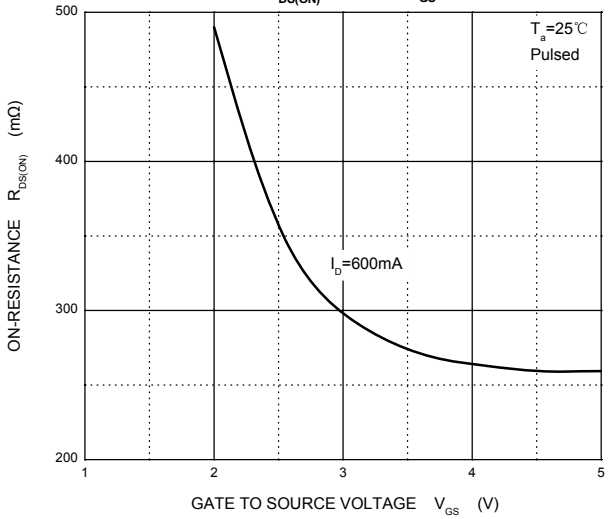
Transfer Characteristics



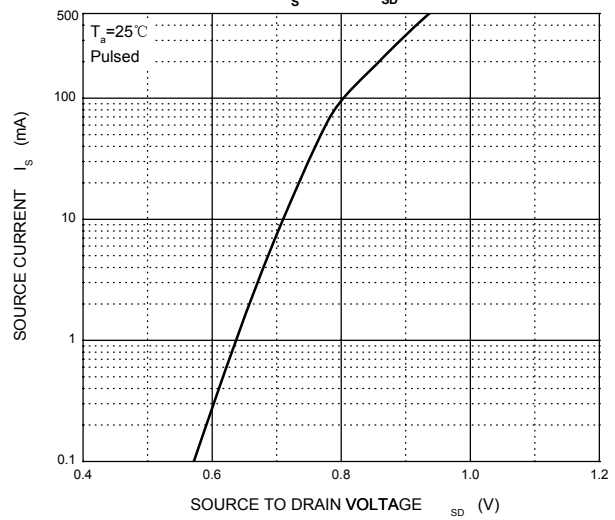
$R_{DS(ON)}$ — I_D



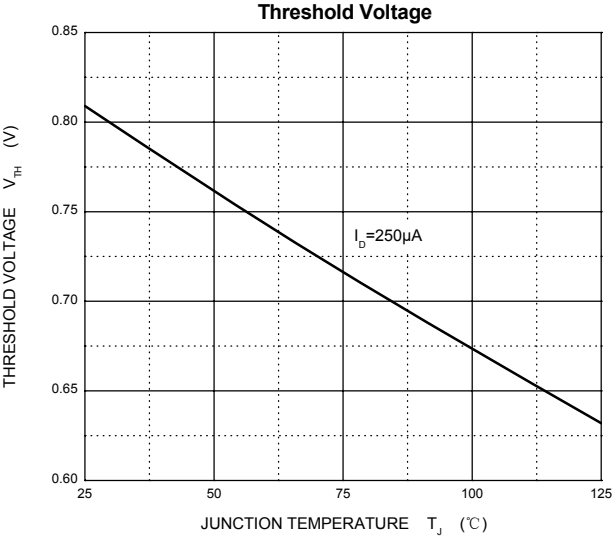
$R_{DS(ON)}$ — V_{GS}



I_S — V_{SD}



Threshold Voltage



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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