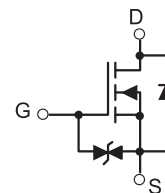




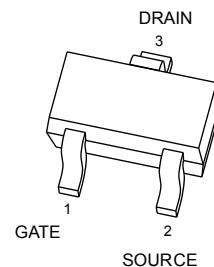
### MT1012W N-Channel Power MOSFET

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	$I_D$
20V	700mΩ@4.5V	500mA
	850mΩ@2.5V	



### FEATURE

- High-Side Switching
- Low On-Resistance
- Low Threshold
- Fast Switching Speed
- ESD protected



### APPLICATIONS

- Drivers: Relays, Solenoids, Lamps, Hammers, Displays, Memories
- Battery Operated Systems
- Power Supply Converter Circuits
- Load/Power Switching Cell Phones, Pagers

**SOT-323**

Marking : NA1

### Maximum ratings ( $T_a=25^{\circ}C$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source voltage	$V_{DSS}$	20	V
Gate-Source Voltage	$V_{GS}$	±10	
Drain Current-Continuous	$I_{D(DC)}$	500	mA
Drain Current -Pulsed(note1)	$I_{DM(pulse)}$	1000	
Power Dissipation (note 2 , $T_a=25^{\circ}C$ )	$P_D$	150	mW
Maximum Power Dissipation (note 3 , $T_c=25^{\circ}C$ )		275	
Thermal Resistance from Junction to Ambient	$R_{\theta JA}$	833	$^{\circ}C/W$
Thermal Resistance from Junction to Case	$R_{\theta JC}$	455	
Storage Temperature	$T_j$	150	$^{\circ}C$
Junction Temperature	$T_{stg}$	-55 ~+150	



$T_a=25^{\circ}\text{C}$  unless otherwise specified

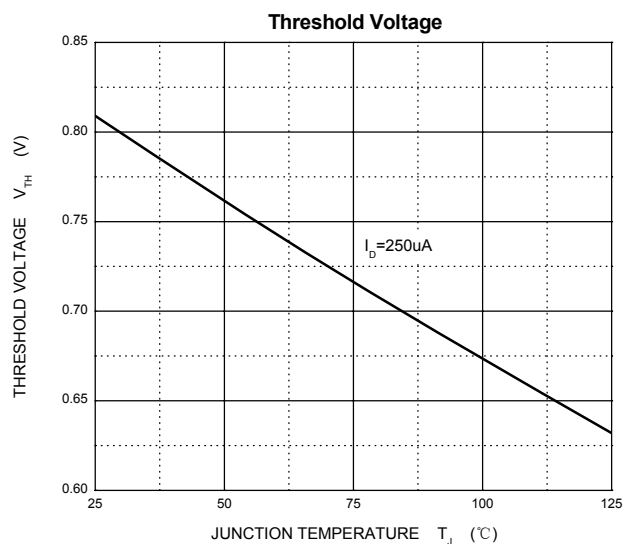
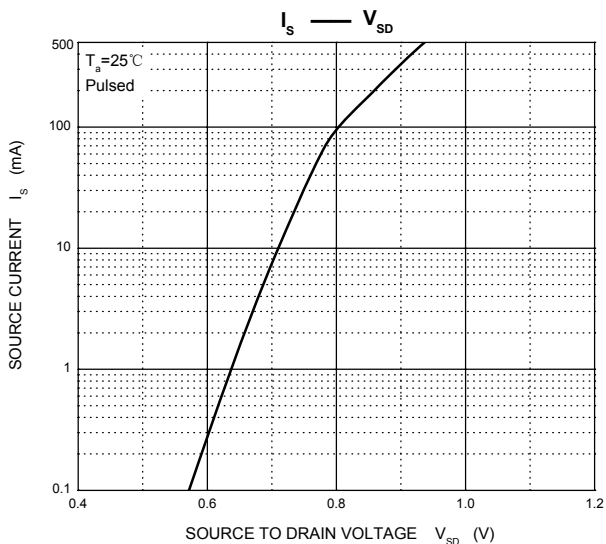
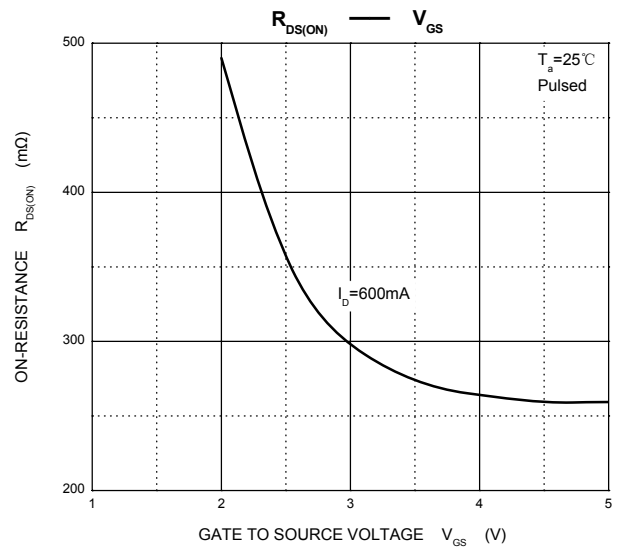
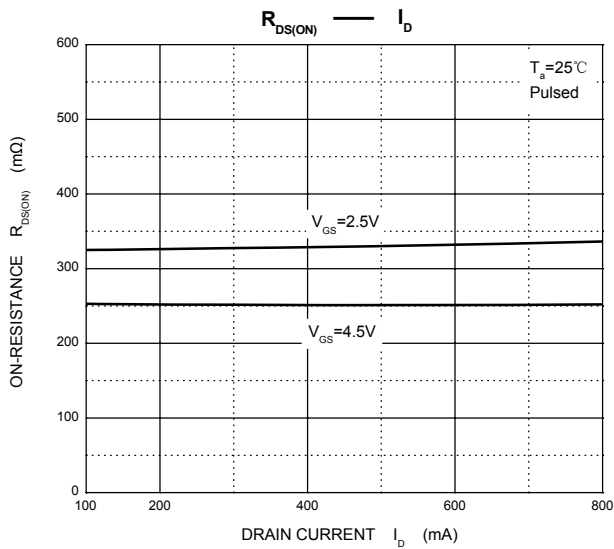
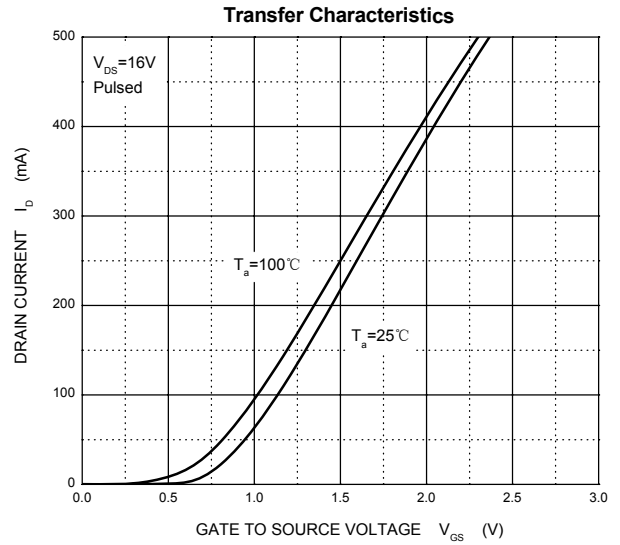
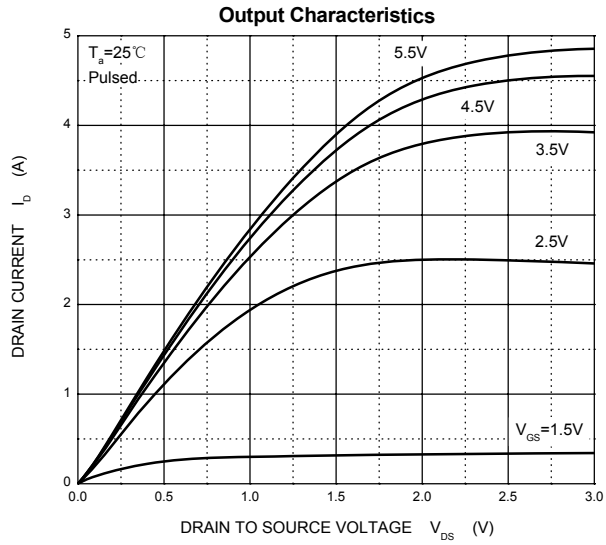
Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
<b>On/Off States</b>						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 250\mu A$	20			V
Gate-Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	0.45	0.8	1.2	
Gate-Body Leakage Current	$I_{GSS}$	$V_{DS} = 0V, V_{GS} = \pm 4.5V$			$\pm 1$	$\mu A$
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
<b>Dynamic Characteristics</b>						
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		
<b>Switching Times (note 4)</b>						
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		
<b>Drain-Source Diode Characteristics</b>						
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  $T_a=25^{\circ}\text{C}$ .
3. This test is performed with infinite heat sink at  $T_c=25^{\circ}\text{C}$ .
4. These parameters have no way to verify.
5. Pulse Test : Pulse Width $\leq 300\mu s$ , Duty Cycle $\leq 0.5\%$ .

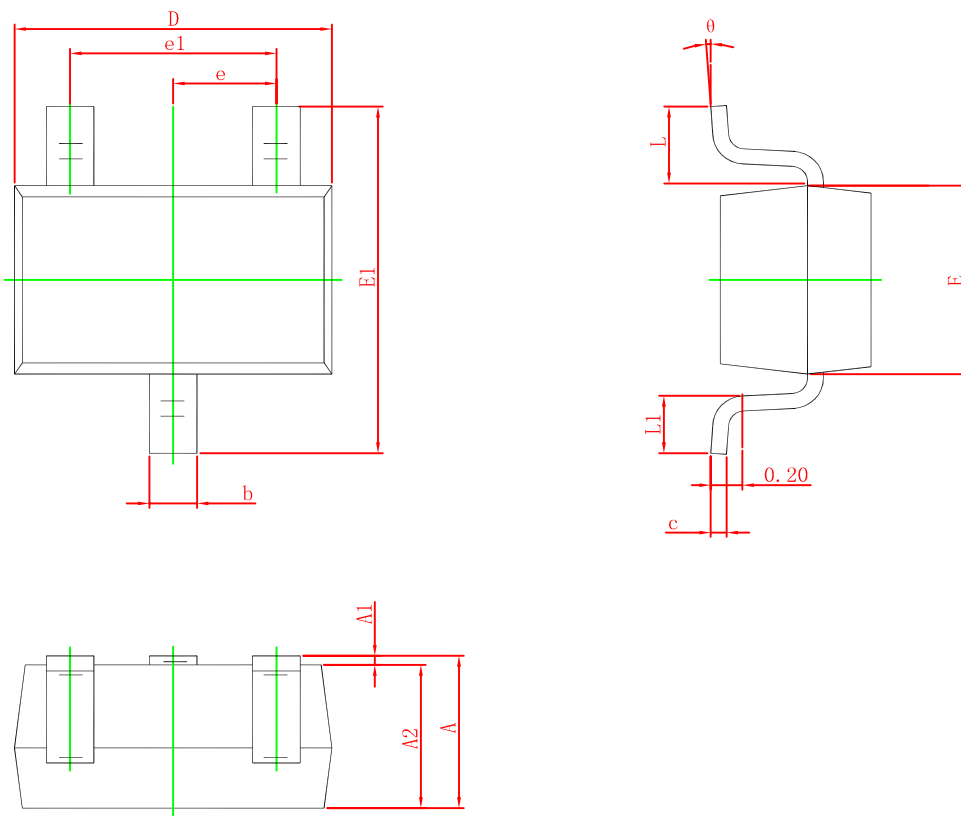


### Typical Characteristics





### SOT-323 PACKAGE OUTLINE DIMENSIONS



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.100	0.035	0.043
A1	0.000	0.100	0.000	0.004
A2	0.900	1.000	0.035	0.039
b	0.200	0.400	0.008	0.016
c	0.080	0.150	0.003	0.006
D	2.000	2.200	0.079	0.087
E	1.150	1.350	0.045	0.053
E1	2.150	2.450	0.085	0.096
e	0.650 TYP.		0.026 TYP.	
e1	1.200	1.400	0.047	0.055
L	0.525 REF.		0.021 REF.	
L1	0.260	0.460	0.010	0.018
θ	0°	8°	0°	8°