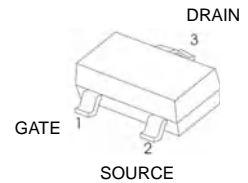
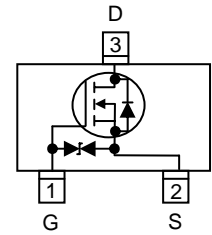




MT2021W Plastic-Encapsulate MOSFETS

N-Channel, 20V, 0.89A, Small Signal MOSFET

V_{DS} (V)	$R_{ds(on)}$ (Ω)	I_D (A)
20	0.220 @ $V_{GS}=4.5V$	0.55
	0.260 @ $V_{GS}=2.5V$	0.45
	0.320 @ $V_{GS}=1.8V$	0.35



SOT-323

Descriptions

The MT2021W is N-Channel enhancement MOS Field Effect Transistor. Uses advanced trench technology and design to provide excellent $R_{DS(ON)}$ with low gate charge. This device is suitable for use in DC-DC conversion, load switch and level shift. Standard Product MT2021W is Pb-free.

Features

- Trench Technology
- Supper high density cell design
- Excellent ON resistance
- Extremely Low Threshold Voltage

Applications

- DC-DC converter circuit
- Small Signal Switch
- Load Switch
- Level Shift

Marking : 21



Absolute Maximum ratings

Parameter		Symbol	10 S	Steady State	Unit
Drain-Source Voltage		V_{DS}	20		V
Gate-Source Voltage		V_{GS}	± 6		
Continuous Drain Current ^a	$T_A=25^{\circ}\text{C}$	I_D	0.89	0.82	A
	$T_A=70^{\circ}\text{C}$		0.71	0.65	
Maximum Power Dissipation ^a	$T_A=25^{\circ}\text{C}$	P_D	0.37	0.31	W
	$T_A=70^{\circ}\text{C}$		0.23	0.20	
Continuous Drain Current ^b	$T_A=25^{\circ}\text{C}$	I_D	0.78	0.70	A
	$T_A=70^{\circ}\text{C}$		0.62	0.56	
Maximum Power Dissipation ^b	$T_A=25^{\circ}\text{C}$	P_D	0.29	0.23	W
	$T_A=70^{\circ}\text{C}$		0.18	0.14	
Pulsed Drain Current ^c		I_{DM}	1.4		A
Operating Junction Temperature		T_J	150		$^{\circ}\text{C}$
Lead Temperature		T_L	260		$^{\circ}\text{C}$
Storage Temperature Range		T_{stg}	-55 to 150		$^{\circ}\text{C}$

Thermal resistance ratings

Parameter		Symbol	Typical	Maximum	Unit
Junction-to-Ambient Thermal Resistance ^a	$t \leq 10\text{ s}$	$R_{\theta JA}$	275	335	$^{\circ}\text{C}/\text{W}$
	Steady State		325	395	
Junction-to-Ambient Thermal Resistance ^b	$t \leq 10\text{ s}$	$R_{\theta JA}$	375	430	
	Steady State		445	535	
Junction-to-Case Thermal Resistance	Steady State	$R_{\theta JC}$	260	300	

a Surface mounted on FR4 Board using 1 square inch pad size, 1oz copper

b Surface mounted on FR4 board using minimum pad size, 1oz copper

c Repetitive rating, pulse width limited by junction temperature, $t_p=10\mu\text{s}$, Duty Cycle=1%

d Repetitive rating, pulse width limited by junction temperature $T_J=150^{\circ}\text{C}$.

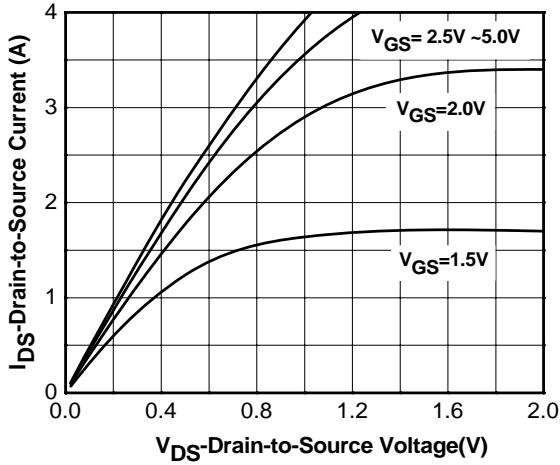


Electronics Characteristics (Ta=25°C, unless otherwise noted)

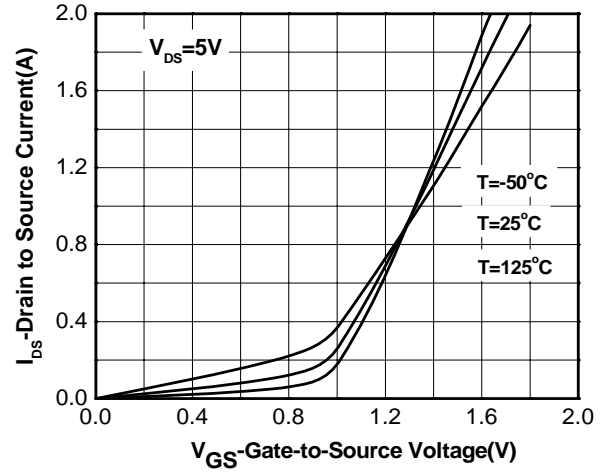
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Drain-to-Source Breakdown Voltage	BV _{DSS}	V _{GS} = 0 V, I _D = 250uA	20			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 16 V, V _{GS} = 0V			100	nA
Gate-to-source Leakage Current	I _{GSS}	V _{DS} = 0 V, V _{GS} = ±5V			5	uA
ON CHARACTERISTICS						
Gate Threshold Voltage	V _{GS(TH)}	V _{GS} = V _{DS} , I _D = 250uA	0.45	0.58	0.85	V
Drain-to-source On-resistance	R _{DS(on)}	V _{GS} = 4.5V, I _D = 0.55A		220	260	mΩ
		V _{GS} = 2.5V, I _D = 0.45A		260	310	
		V _{GS} = 1.8V, I _D = 0.35A		320	380	
Forward Transconductance	g _{FS}	V _{DS} = 5 V, I _D = 0.55A		2.0		S
CHARGES, CAPACITANCES AND GATE RESISTANCE						
Input Capacitance	C _{ISS}	V _{GS} = 0 V, f = 1.0 MHz, V _{DS} = 10 V		50		pF
Output Capacitance	C _{OSS}			13		
Reverse Transfer Capacitance	C _{RSS}			8		
Total Gate Charge	Q _{G(TOT)}	V _{GS} = 4.5 V, V _{DS} = 10 V, I _D = 0.55A		1.15		nC
Threshold Gate Charge	Q _{G(TH)}			0.06		
Gate-to-Source Charge	Q _{GS}			0.15		
Gate-to-Drain Charge	Q _{GD}			0.23		
SWITCHING CHARACTERISTICS						
Turn-On Delay Time	td(ON)	V _{GS} = 4.5 V, V _{DS} = 10V, R _L = 3 Ω, R _G = 6 Ω		22		ns
Rise Time	tr			80		
Turn-Off Delay Time	td(OFF)			700		
Fall Time	tf			380		
BODY DIODE CHARACTERISTICS						
Forward Voltage	V _{SD}	V _{GS} = 0 V, I _S = 0.35A	0.5	0.7	1.1	V



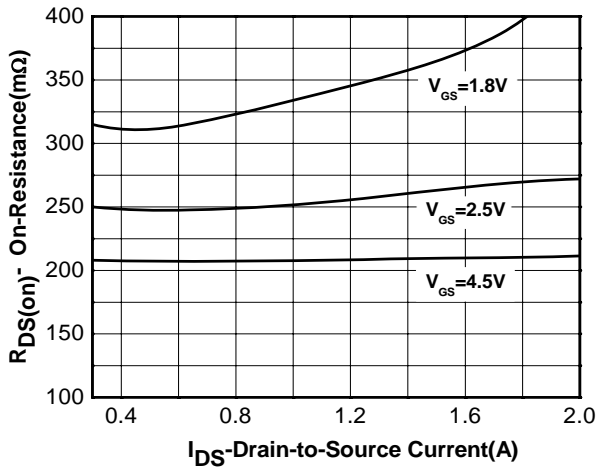
Typical Characteristics (Ta=25°C, unless otherwise noted)



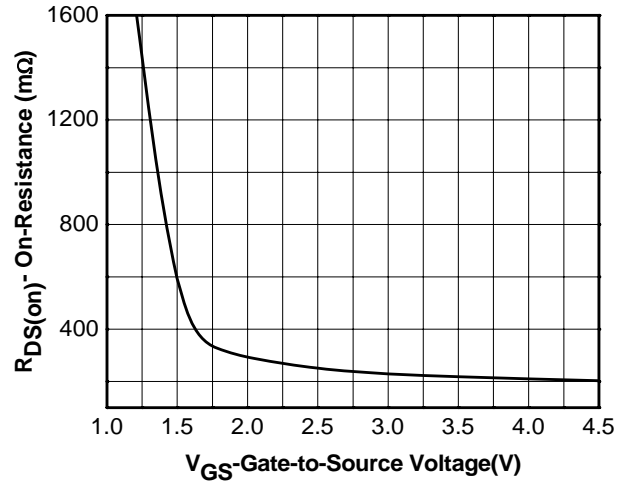
Output characteristics



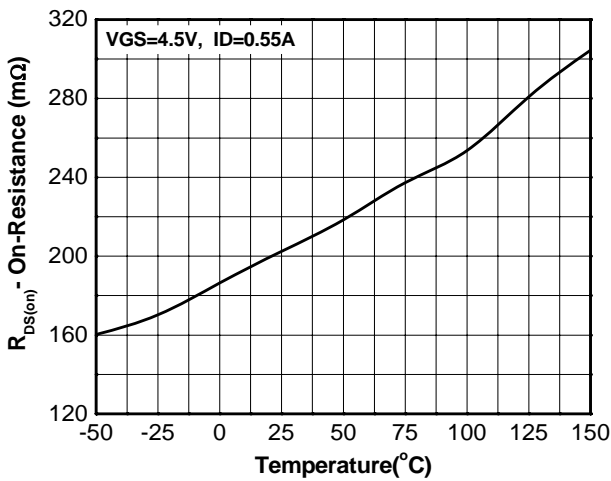
Transfer characteristics



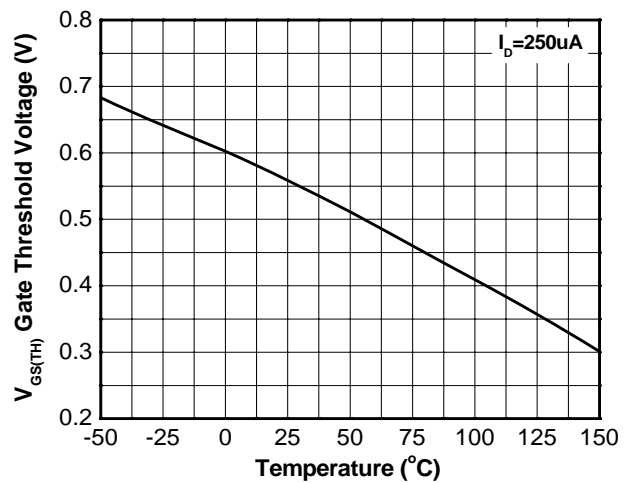
On-Resistance vs. Drain current



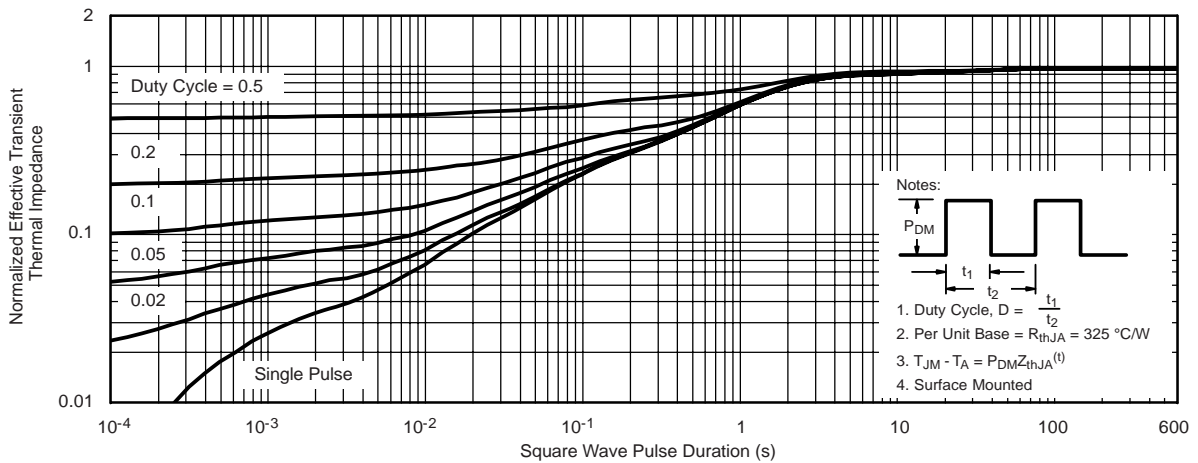
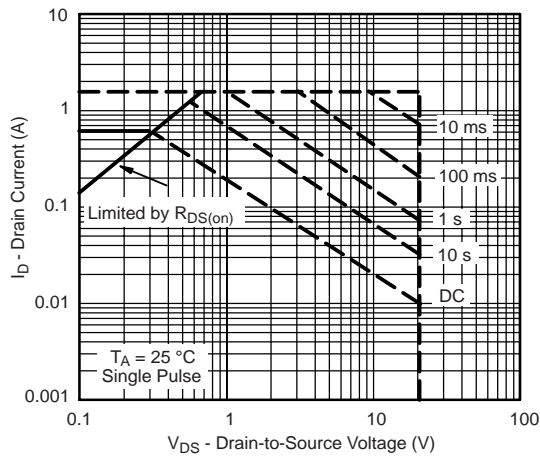
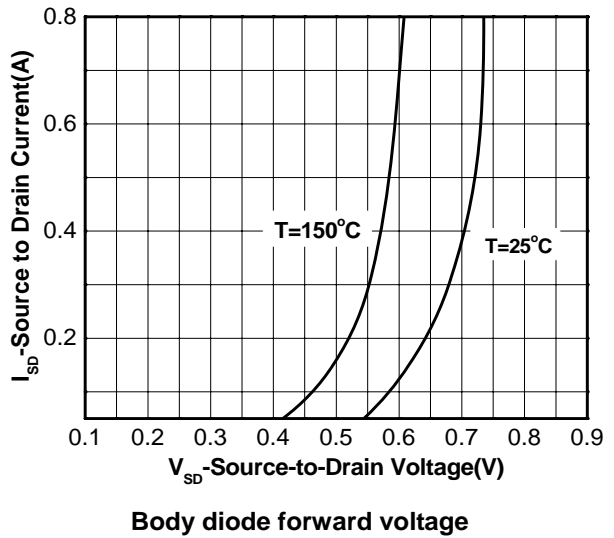
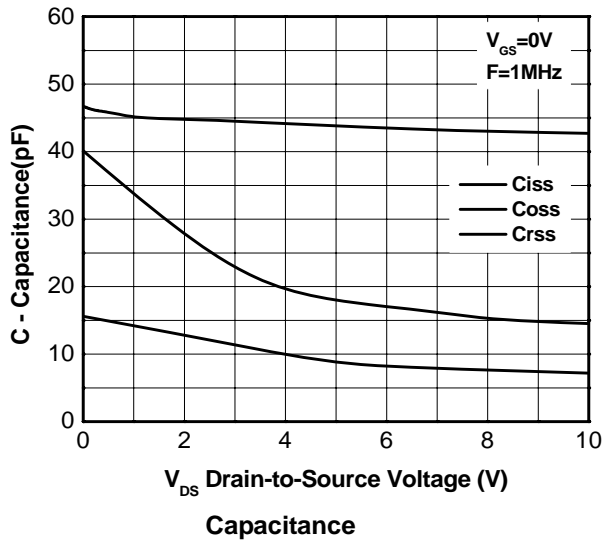
On-Resistance vs. Gate-to-Source voltage



On-Resistance vs. Junction temperature

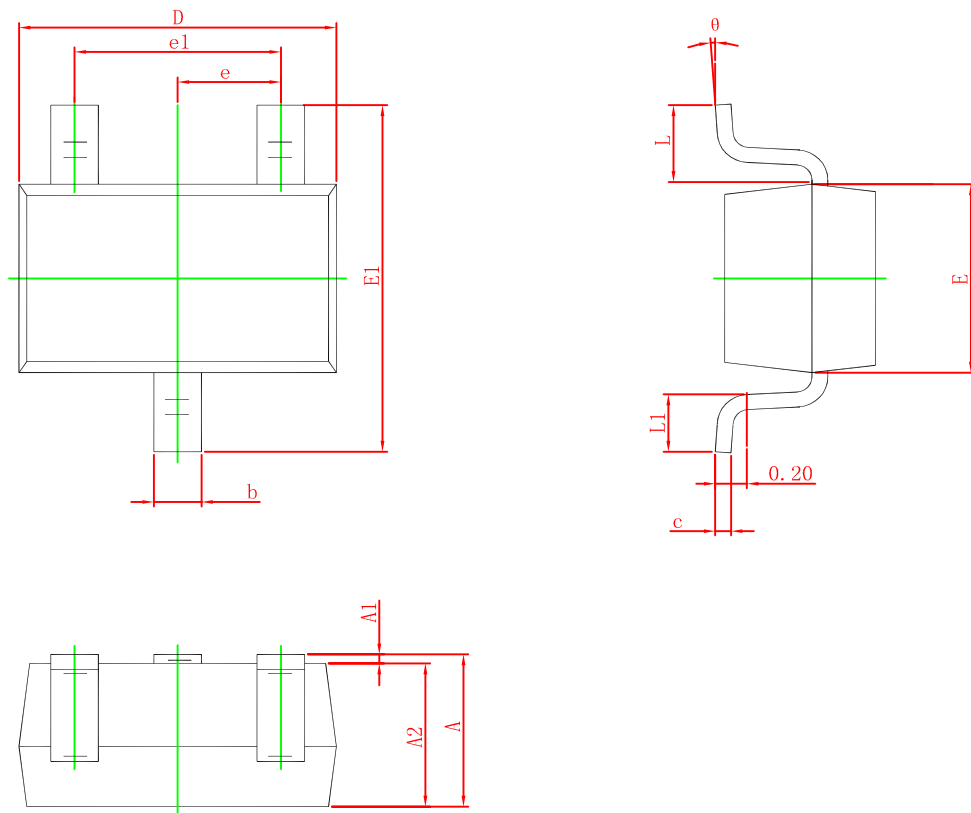


Threshold voltage vs. Temperature





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°