Elektronische Bauelemente

STT3981

-1.6 A, -20 V, RDS(ON) 180 mΩ
P-Channel Enhancement Mode Mos.FET

RoHS Compliant Product
A suffix of "-C" specifies halogen and lead-free

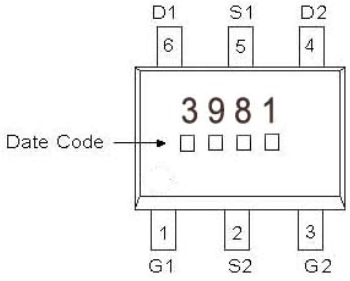
DESCRIPTION

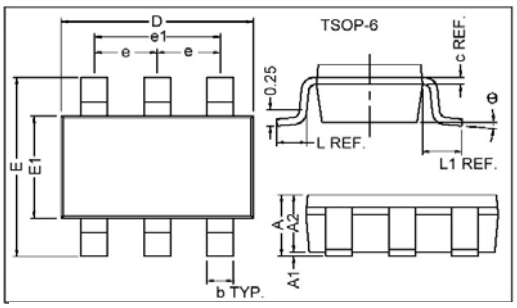
The STT3981 utilized advance processing techniques to achieve the lowest possible on-resistance, extremely efficient and cost-effectiveness device. The STT3981 is universally used for all commercial-industrial applications.

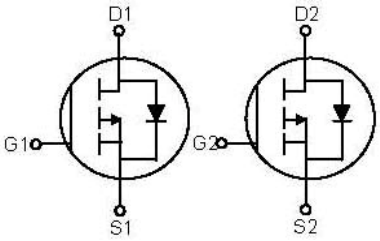
FEATURES

- Low On-Resistance
- Low Gate Charge

PACKAGE DIMENSIONS







REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	1.10 Max		L	0.45 Ref	
A1	0	0.10	L1	0.60 Ref	
A2	0.70	1.00		0°	10°
c	0.12 Ref		b	0.30	0.50
D	2.70	3.10	e	0.95 Ref	
E	2.60	3.00	e1	1.90 Ref	
E1	1.40	1.80			

ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Ratings	Unit
Drain-Source Voltage	V_{DS}	-20	V
Gate-Source Voltage	V_{GS}	±8	V
Continuous Drain Current[3]	I_D @T_A=25℃ I_D @T_A=70℃	-1.6 -1.3	A
Pulsed Drain Current[1]	I_{DM}	-8	A
Power Dissipation	P_D @T_A=25℃	0.8	W
Linear Derating Factor		0.006	W/℃
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 ~ +150	℃

THERMAL DATA

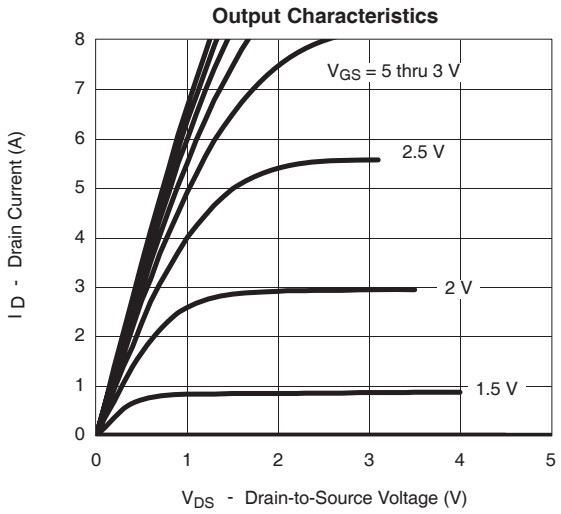
Parameter	Symbol	Ratings	Unit
Thermal Resistance Junction-ambient[3] (Max)	$R_{\theta JA}$	150	℃/W

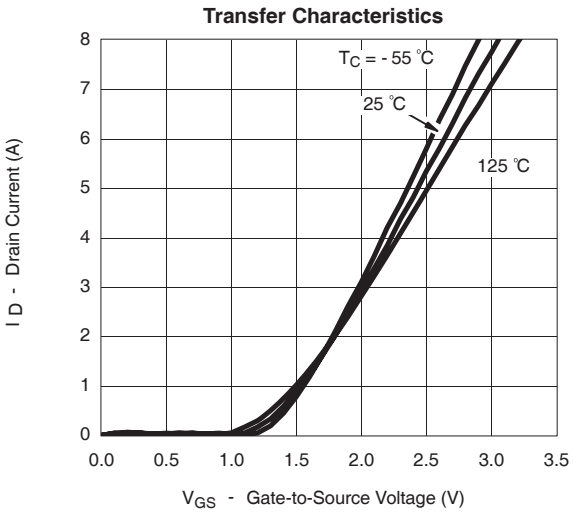
ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise specified)

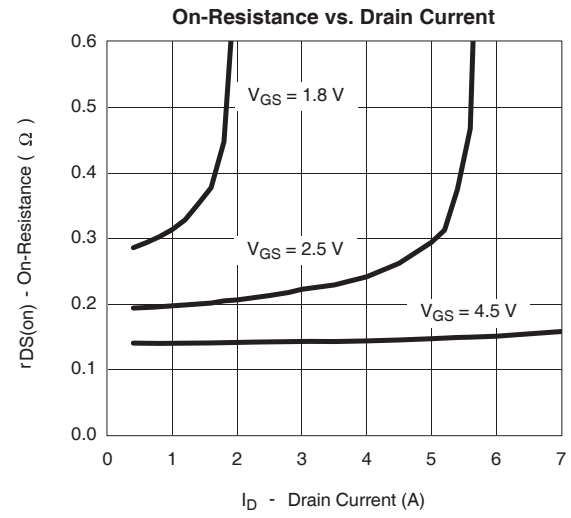
Parameter	Symbol	Min	Typ	Max	Unit	Test Conditions
Static						
Drain-Source Breakdown Voltage	BV_{DSS}	-20	-	-	V	V_{GS} = 0, I_D=250 uA
Gate Threshold Voltage	$V_{GS(th)}$	-0.4	-	-1.1	V	V_{DS} = V_{GS}, I_D=250 uA
Gate Leakage Current	I_{GSS}	-	-	±100	nA	V_{GS} = ±8 V
Drain-Source Leakage Current (Tj=25℃)	I_{DSS}	-	-	-1	uA	V_{DS} = -20 V, V_{GS} = 0
Drain-Source Leakage Current (Tj=70℃)		-	-	-20		V_{DS} = -16 V, V_{GS} = 0
Drain-Source On-Resistance	$R_{DS(ON)}$	-	100	150	mΩ	V_{GS} = -4.5 V, I_D = -1.9 A
		-	160	210		V_{GS} = -2.5 V, I_D = -1.6 A
		-	260	300		V_{GS} = -1.8 V, I_D = -0.7 A
Forward Transconductance	g_{fs}	-	4	-	S	V_{DS} = -5V, I_D = -1.9A
Diode Forward Voltage[2]	V_{SD}	-	-0.84	-1.1	V	I_S = -1.0A, V_{GS} = 0V
Dynamic						
Total Gate Charge[2]	Q_g	-	6	7.5	nC	I_D = -1.9 A V_{DS} = -10 V V_{GS} = -4.5 V
Gate-Source Charge	Q_{gs}	-	0.52	-		
Gate-Drain (“Miller”) Charge	Q_{gd}	-	1.02	-		
Turn-on Delay Time[2]	$T_{d(on)}$	-	50	65	nS	V_{DS} = -10 V I_D = -1 A V_{GEN} = -4.5 V R_G = 6 Ω R_L = 10 Ω
Rise Time	T_r	-	40	60		
Turn-off Time	$T_{d(off)}$	-	168	180		
Fall Time	T_f	-	64	75		
Input Capacitance	Ciss	-	450	-	pF	V_{GS} = 0 V V_{DS} = -15 V f = 1.0 MHz
Output Capacitance	Coss	-	60	-		
Reverse Transfer Capacitance	Crss	-	47	-		

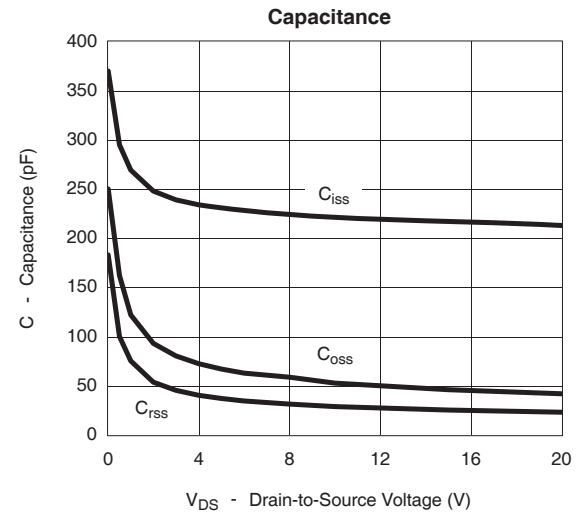
Notes: 1. Pulse width limited by maximum junction temperature.
2. Pulse width≦300us, duty cycle≦2%.
3. Surface mounted on 1 in^2 copper pad of FR4 board; 180 °C/W when mounted on minimum copper pad.

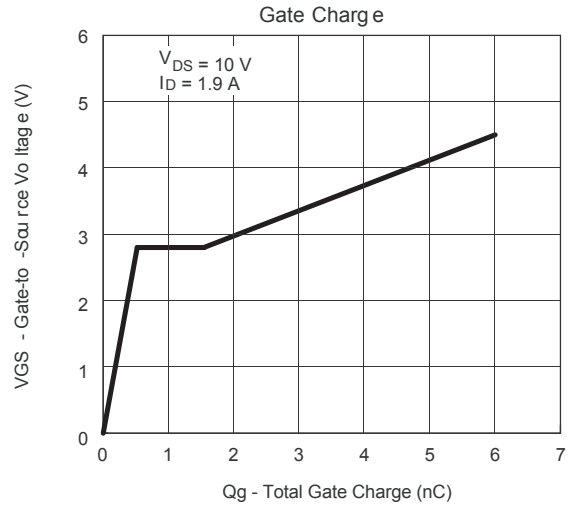
CHARACTERISTIC CURVES

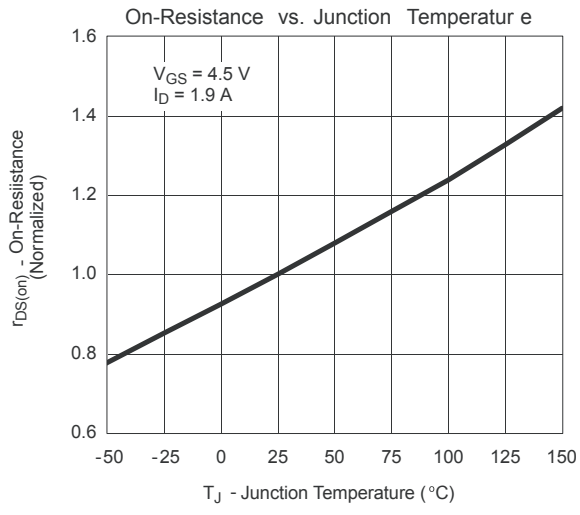




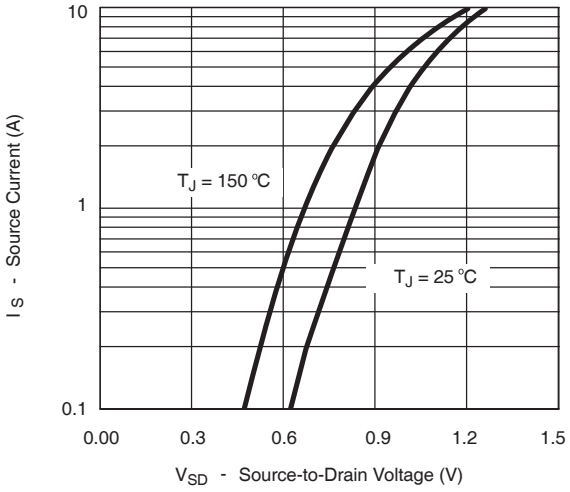




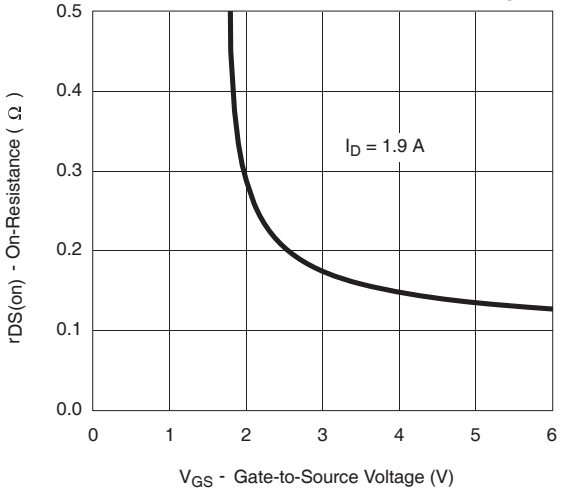




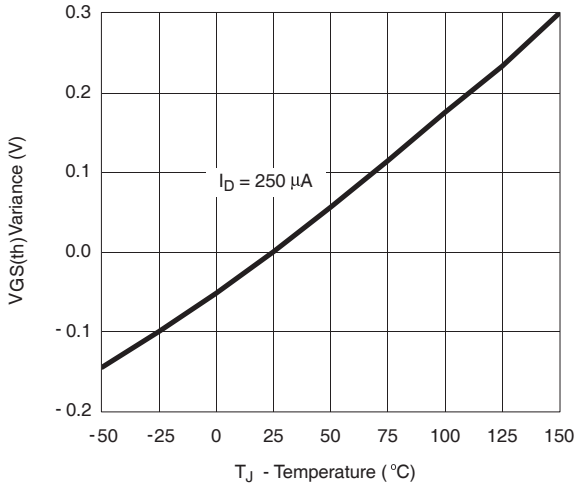
Source-Drain Diode Forward Voltage



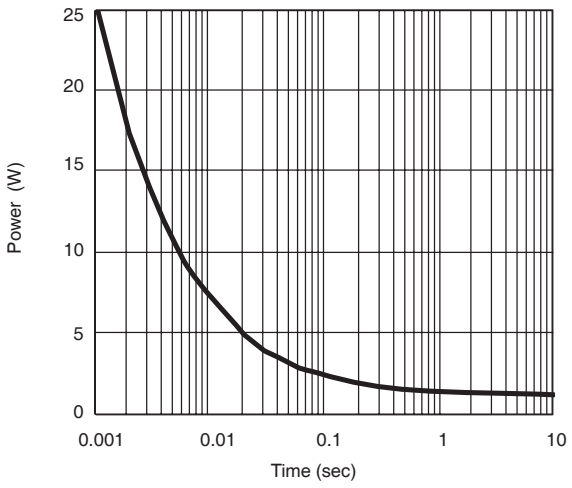
On-Resistance vs. Gate-to-Source Voltage



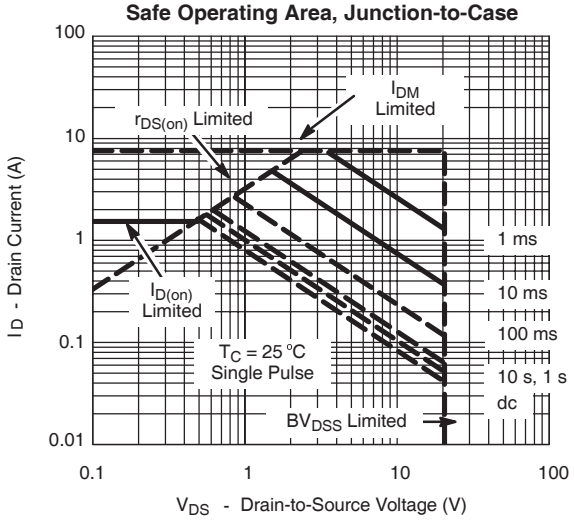
Threshold Voltage

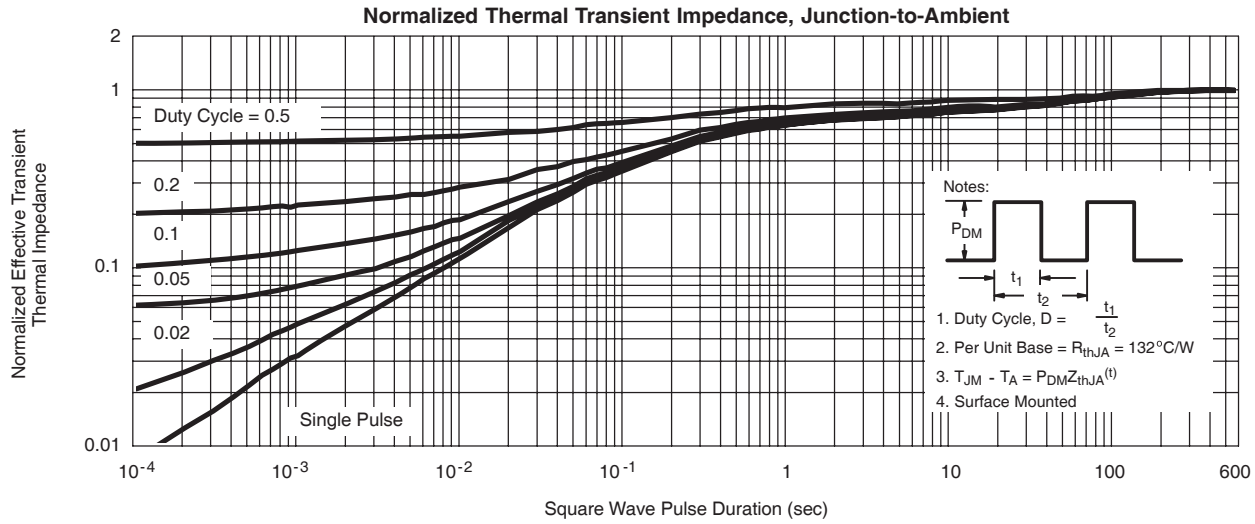


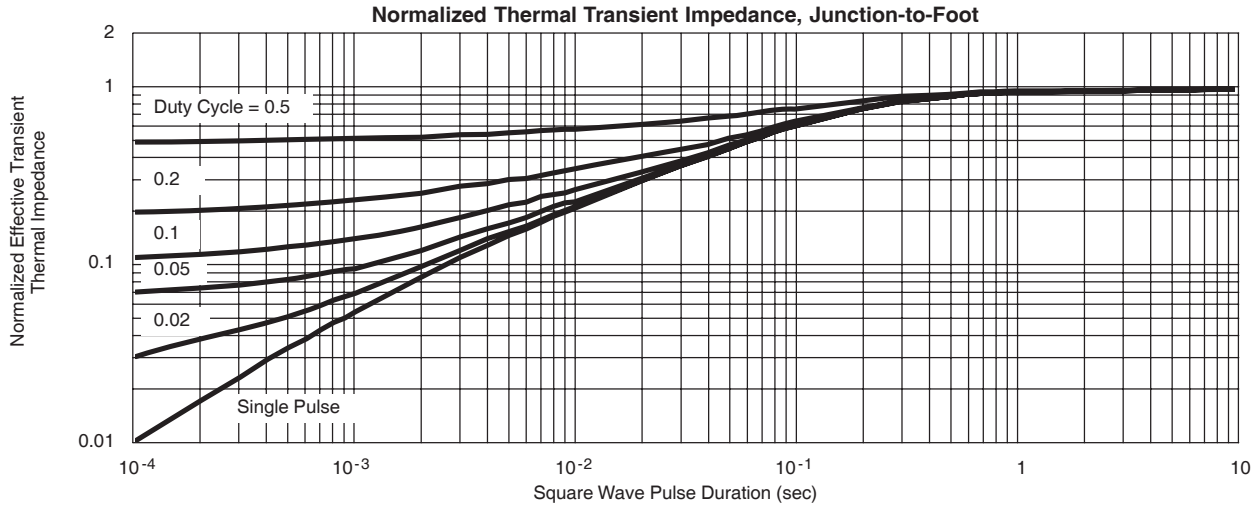
Single Pulse Power, Junction-to-Ambient



Safe Operating Area, Junction-to-Case




Normalized Thermal Transient Impedance, Junction-to-Ambient
Normalized Effective Transient Thermal Impedance
2
1
0.1
0.01
Duty Cycle = 0.5
0.2
0.1
0.05
0.02
Single Pulse
Notes:
P_DM
t1
t2
1. Duty Cycle, D = t1/t2
2. Per Unit Base = R_thJA = 132°C/W
3. T_JM - T_A = P_DM Z_thJA(t)
4. Surface Mounted
10^-4
10^-3
10^-2
10^-1
1
10
100
600
Square Wave Pulse Duration (sec)


Normalized Thermal Transient Impedance, Junction-to-Foot
Normalized Effective Transient Thermal Impedance
2
1
0.1
0.01
Duty Cycle = 0.5
0.2
0.1
0.05
0.02
Single Pulse
10^-4
10^-3
10^-2
10^-1
1
10
Square Wave Pulse Duration (sec)