

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

DESCRIPTION

The SSF7401 uses advanced trench technology to provide excellent on-resistance, low gate charge and operation with gate voltage as low as 2.5V. It can be used for a wide variety of applications, including load switching, low current inverters and low current DC-DC converters. The SSF7401 is universally used for all commercial-industrial applications.

FEATURES

- Small Package Outline
- Lower Gate Charge

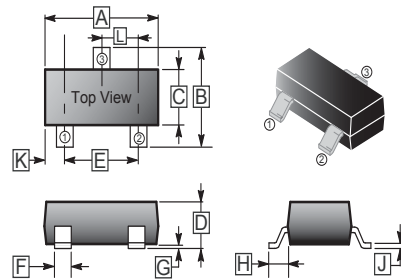
MARKING CODE

7401

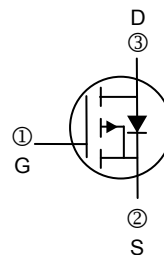
PACKAGE INFORMATION

Package	MPQ	Leader Size
SOT-323	3K	7 inch

SOT-323



REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	1.80	2.20	G	0.100 REF.	
B	1.80	2.45	H	0.525 REF.	
C	1.15	1.35	J	0.08	0.25
D	0.80	1.10	K	-	-
E	1.20	1.40	L	0.650 TYP.	
F	0.20	0.40			



ABSOLUTE MAXIMUM RATINGS

Parameter		Symbol	Ratings	Unit
Drain-Source Voltage		V_{DSS}	-30	V
Gate-Source Voltage		V_{GSS}	±12	V
Continuous Drain Current ³	$T_A=25^{\circ}\text{C}$	I_D	-2	A
	$T_A=70^{\circ}\text{C}$		-1.5	A
Pulsed Drain Current ^{1,2}		I_{DM}	-10	A
Linear Derating Factor			0.0028	$^{\circ}\text{C} / \text{W}$
Power Dissipation		P_D	0.35	W
Thermal Resistance Junction-Ambient ³		$R_{\theta JA}$	360	$^{\circ}\text{C} / \text{W}$
Operating Junction and Storage Temperature		T_J, T_{STG}	-55~150	$^{\circ}\text{C}$

Note:

1. Pulse width limited by Max. junction temperature.
2. Pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 2\%$.
3. Surface mounted on FR4 board, $t \leq 10\text{sec}$

ELECTRICAL CHARACTERISTICS ($T_J=25^\circ\text{C}$ unless otherwise specified)

Parameter		Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Drain-Source Breakdown Voltage		V _{(BR)DSS}	-30	-	-	V	V _{GS} =0, I _D = -250μA
Gate Threshold Voltage		V _{GS(th)}	-0.5	-	-1.2	V	V _{DS} =V _{GS} , I _D = -250μA
Gate Body Leakage Current		I _{GSS}	-	-	±100	nA	V _{GS} = ±12V
Zero Gate Voltage Drain Current	T _J = 25°C	I _{DSS}	-	-	-1	μA	V _{DS} = -30V, V _{GS} =0
	T _J = 70°C		-	-	-10		V _{DS} = -24V, V _{GS} =0
Drain-Source on-State Resistance		R _{DS(ON)}	-	-	120	mΩ	V _{GS} = -10V, I _D = -2A
			-	-	150		V _{GS} = -4.5V, I _D = -1.5A
			-	-	190		V _{GS} = -2.5V, I _D = -1A
Forward Transconductance		g _{FS}	-	4		S	V _{DS} = -5V, I _D = -1.2A
Gate Resistance		R _g	-	12	-	Ω	f=1.0MHz
Dynamic							
Total Gate Charge ²		Q _g	-	5.06	-	nC	V _{DS} = -15V, V _{GS} = -4.5V, I _D = -1A
Gate-Source Charge		Q _{gs}	-	0.72	-		
Gate-Drain (“Miller”)Charge		Q _{gd}	-	1.58	-		
Input Capacitance		C _{iss}	-	409	-	pF	V _{DS} = -15V, V _{GS} =0, f =1MHz
Output Capacitance		C _{oss}	-	55	-		
Reverse Transfer Capacitance		C _{rss}	-	42	-		
Turn-On Time ²		t _{d(on)}	-	6.2	-	ns	V _{DS} = -15V, R _L =15Ω, V _{GS} = -10V, R _G =3Ω
		t _r	-	3.2	-		
Turn-Off Time		t _{d(off)}	-	41.2	-		
		t _f	-	14.5	-		
Source-Drain Diode							
Diode Forward Voltage ²		V _{SD}	-	-	-1	V	I _S = -1A,V _{GS} =0
Reverse Recovery Time ²		T _{RR}	-	13.2	-	nS	I _S =-1A,V _{GS} =0, dI/dt=100A / μS
Reverse Recovery Charge		Q _{rr}	-	5.4	-	nC	
Continuous Source Current (Body Diode)		I _S	-	-	-0.5	A	V _D = V _G =0, V _S = -1V

Note:

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2. Pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 2\%$.
3. Surface mounted on FR4 board, $t \leq 10\text{sec}$

CHARACTERISTIC CURVE

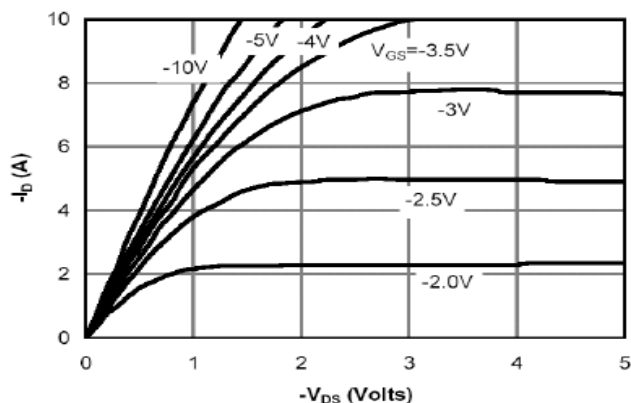


Fig 1. Typical Output Characteristics

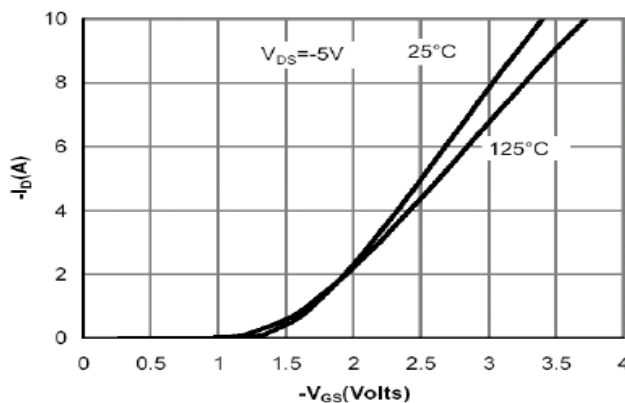


Fig 2. Transfer Characteristics

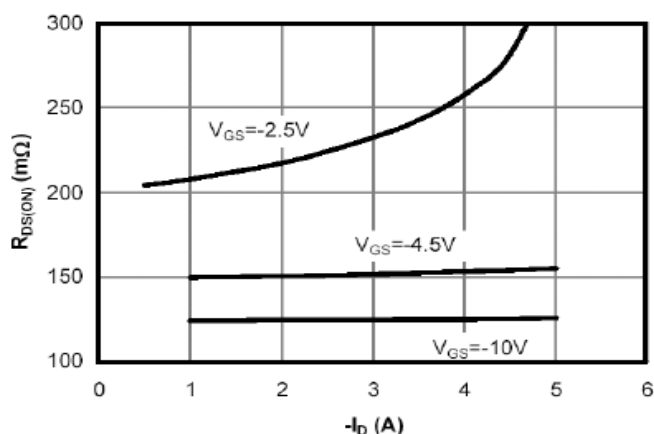


Fig 3. On-Resistance v.s. Drain Current and Gate Voltage

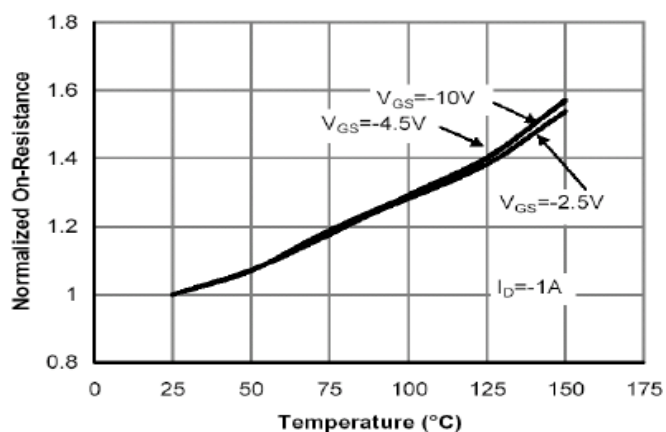


Fig 4. On-Resistance v.s. Junction Temperature

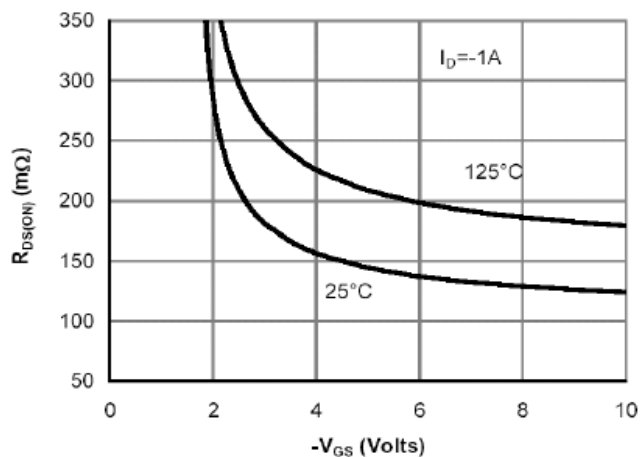


Fig 5. On-Resistance v.s. Gate-Source Voltage

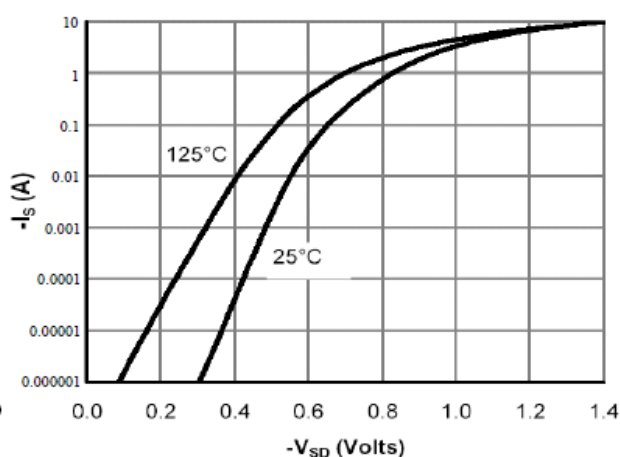


Fig 6. Body Diode Characteristics

CHARACTERISTIC CURVE

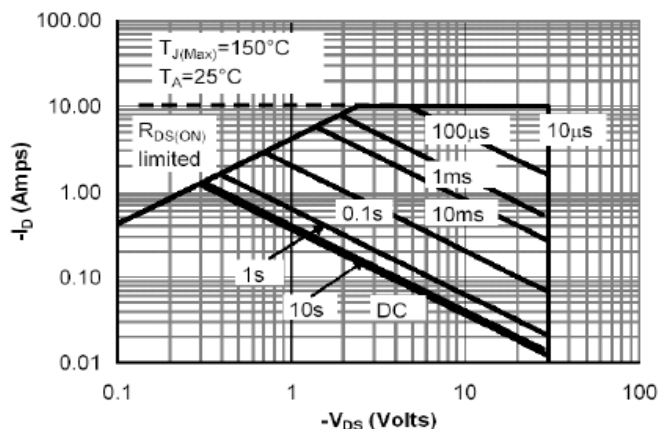
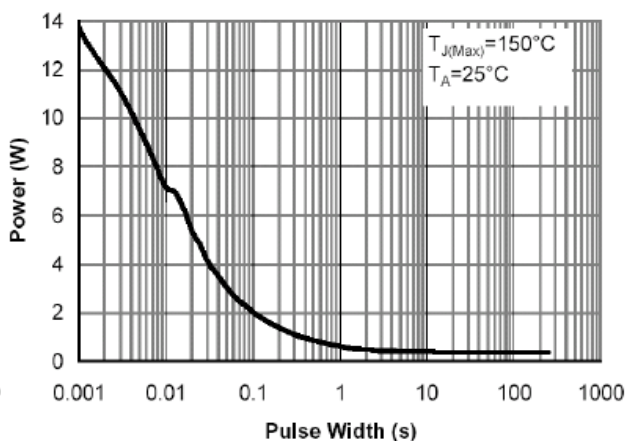


Fig 7. Maximum Safe Operating Area



**Fig 8. Single Pulse Power Rating
Junction-to-Ambient**

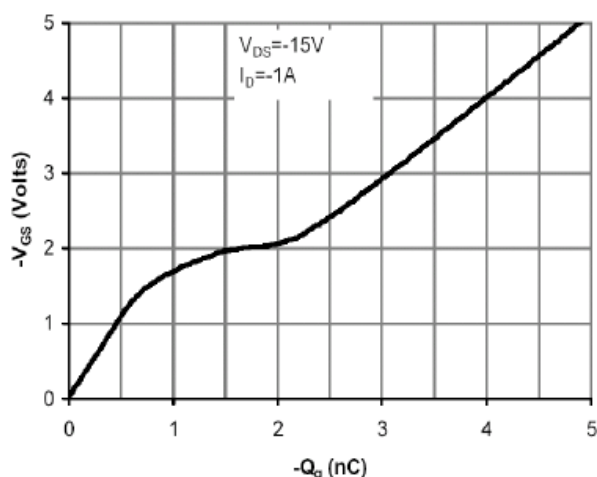


Fig 9. Gate Charge Characteristics

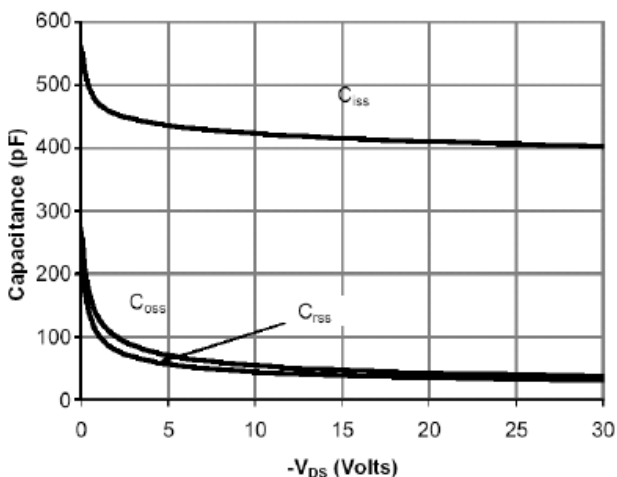


Fig 10. Typical Capacitance Characteristics

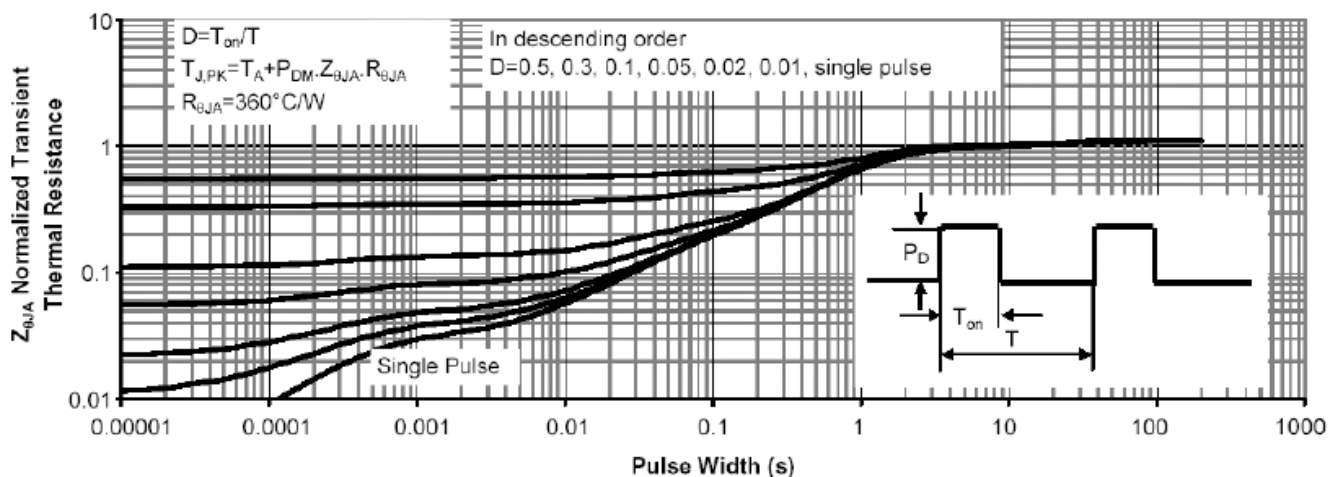


Fig 11. Normalized Maximum Transient Thermal Impedance