

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

## DESCRIPTION

The SSF7400 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.

## FEATURES

- Lower Gate Charge
- Small Package Outline

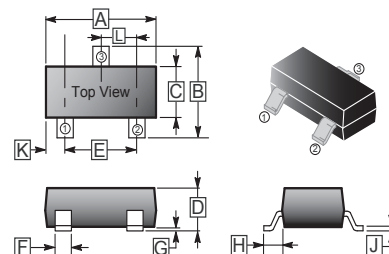
## MARKING

7400

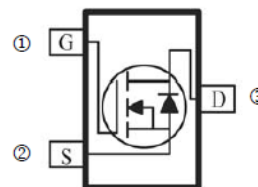
## PACKAGE INFORMATION

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 ( $T_A=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Ratings	Unit
Drain-Source Voltage	$V_{DS}$	30	V
Gate-Source Voltage	$V_{GS}$	$\pm 12$	V
Continuous Drain Current <sup>3</sup>	$I_D$	$T_A=25^\circ\text{C}$	1.7
		$T_A=70^\circ\text{C}$	1.3
Pulsed Drain Current <sup>1,2</sup>	$I_{DM}$	10	A
Power Dissipation	$P_D$	0.35	W
Linear Derating Factor		0.0028	W / $^\circ\text{C}$
Operating Junction and Storage Temperature Range	$T_J, T_{STG}$	-55~150	$^\circ\text{C}$
<b>Thermal Resistance Rating</b>			
Maximum Junction to Ambient <sup>3</sup>	$R_{\theta JA}$	360	$^\circ\text{C} / \text{W}$

Notes:

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,  $t \leq 10\text{sec}$ .

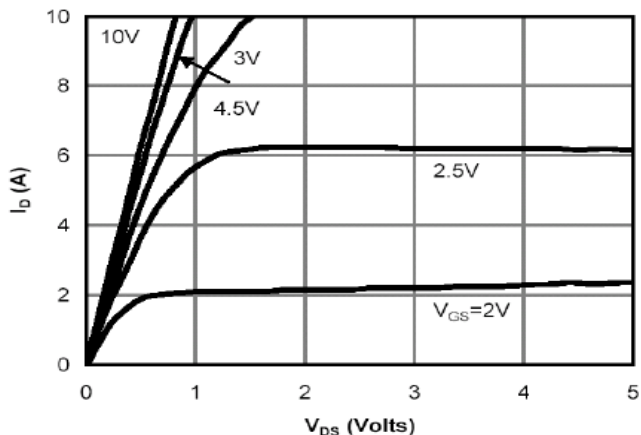
**ELECTRICAL CHARACTERISTICS** ( $T_A=25^\circ\text{C}$  unless otherwise specified)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
<b>Static</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	30	-	-	V	$V_{GS}=0, I_D=250\mu\text{A}$
Gate-Threshold Voltage	$V_{GS(th)}$	0.6	-	1.4	V	$V_{DS}=V_{GS}, I_D=250\mu\text{A}$
Gate-Body Leakage Current	$I_{GSS}$	-	-	$\pm 100$	nA	$V_{GS}=\pm 12\text{V}$
Drain-Source Leakage Current	$I_{DSS}$	-	-	1	$\mu\text{A}$	$V_{DS}=30\text{V}, V_{GS}=0$
		-	-	5		$V_{DS}=24\text{V}, V_{GS}=0$
Drain-Source On-Resistance <sup>1</sup>	$R_{DS(ON)}$	-	-	85	m $\Omega$	$V_{GS}=10\text{V}, I_D=1.5\text{A}$
		-	-	100		$V_{GS}=4.5\text{V}, I_D=1.5\text{A}$
		-	-	140		$V_{GS}=2.5\text{V}, I_D=1\text{A}$
Forward Transconductance	$g_{fs}$	-	4	-	S	$V_{DS}=5\text{V}, I_D=1.5\text{A}$
<b>Dynamic</b>						
Total Gate Charge <sup>1</sup>	$Q_g$	-	4.82	-	nC	$V_{DS}=15\text{V},$ $V_{GS}=4.5\text{V},$ $I_D=1.7\text{A}$
Gate-Source Charge	$Q_{gs}$	-	0.62	-		
Gate-Drain ("Miller") Change	$Q_{gd}$	-	1.58	-		
Turn-on Delay Time <sup>1</sup>	$T_{d(on)}$	-	2.5	-	nS	$V_{DS}=15\text{V},$ $V_{GS}=10\text{V},$ $R_G=3\Omega,$ $R_L=10\Omega,$
Rise Time	$T_r$	-	2.3	-		
Turn-off Delay Time	$T_{d(off)}$	-	22	-		
Fall Time	$T_f$	-	3	-		
Input Capacitance	$C_{iss}$	-	390	-	pF	$V_{GS}=0,$ $V_{DS}=15\text{V},$ $f=1.0\text{MHz}$
Output Capacitance	$C_{oss}$	-	54.4	-		
Reverse Transfer Capacitance	$C_{rss}$	-	41	-		
Gate Resistance	$R_g$	-	3	-	$\Omega$	$f=1.0\text{MHz}$
<b>Source-Drain Diode</b>						
Continuous Source Current (Body Diode)	$I_S$	-	-	0.5	A	$V_G=V_D=0, V_S=1\text{V}$
Diode Forward Voltage <sup>1</sup>	$V_{SD}$	-	-	1	V	$I_S=1\text{A}, V_{GS}=0$
Reverse Recovery Time <sup>1</sup>	$T_{RR}$	-	10	-	ns	$I_S=1.7\text{A}, V_{GS}=0$
Reverse Recovery Charge	$Q_{RR}$	-	3.6	-	nC	$dI/dt=100\text{A}/\mu\text{s}$

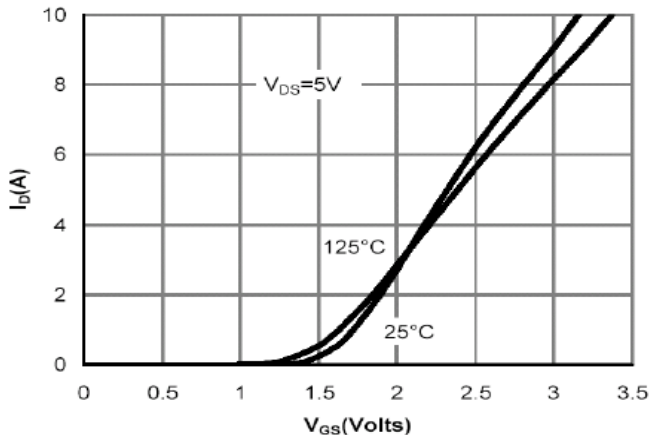
Notes:

1. Pulse width  $\leq 300\mu\text{s}$ , duty cycle  $\leq 2\%$ .

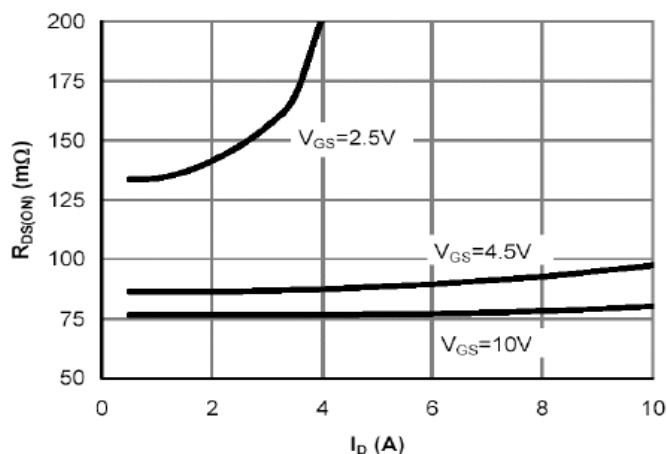
**CHARACTERISTIC CURVE**



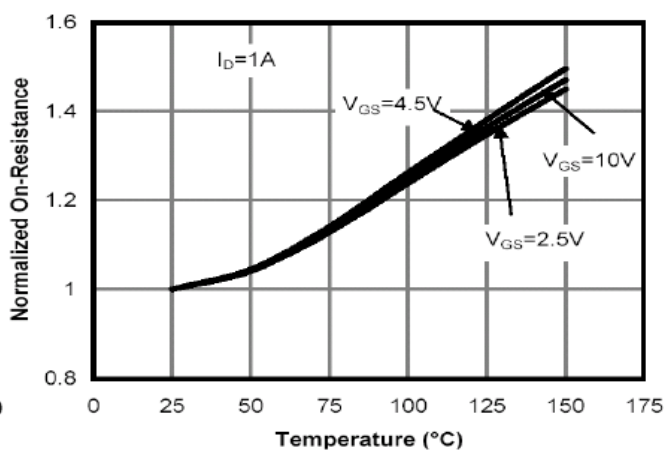
**Fig 1. Typical Output Characteristics**



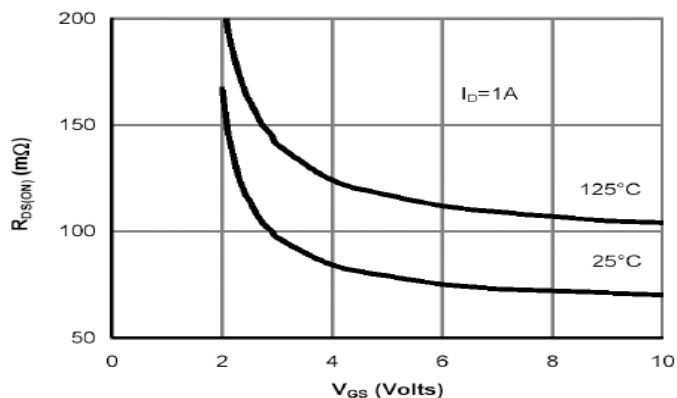
**Fig 2. Transfer Characteristics**



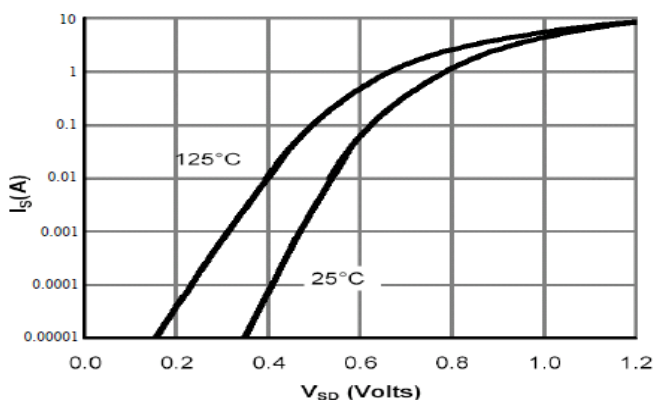
**Fig 3. On-Resistance v.s. Drain Current and Gate Voltage**



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

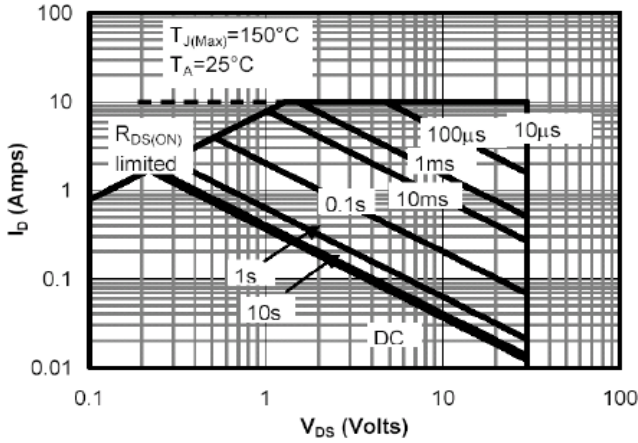


**Fig 5. On-Resistance v.s. Gate-Source Voltage**

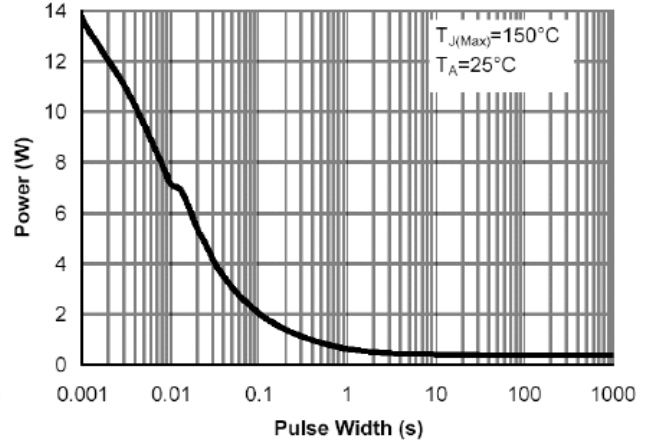


**Fig 6. Body Diode Characteristics**

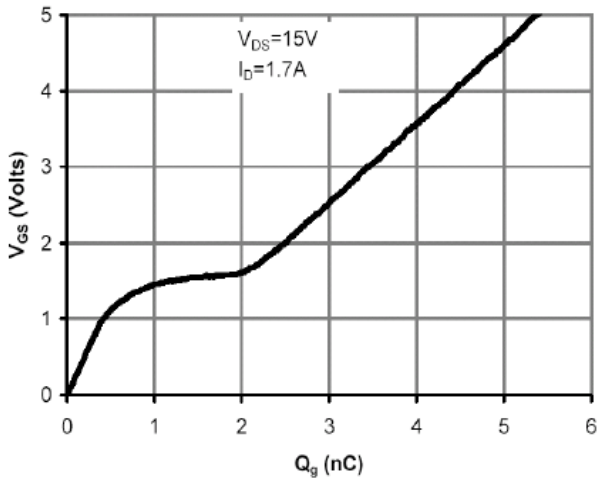
**CHARACTERISTIC CURVE**



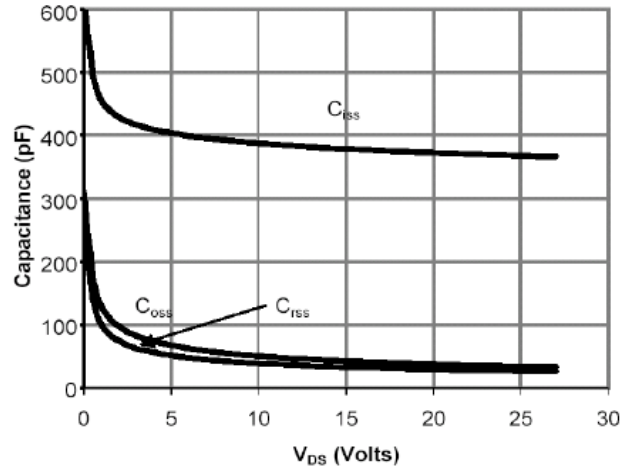
**Fig 7. Maximum Safe Operating Area**



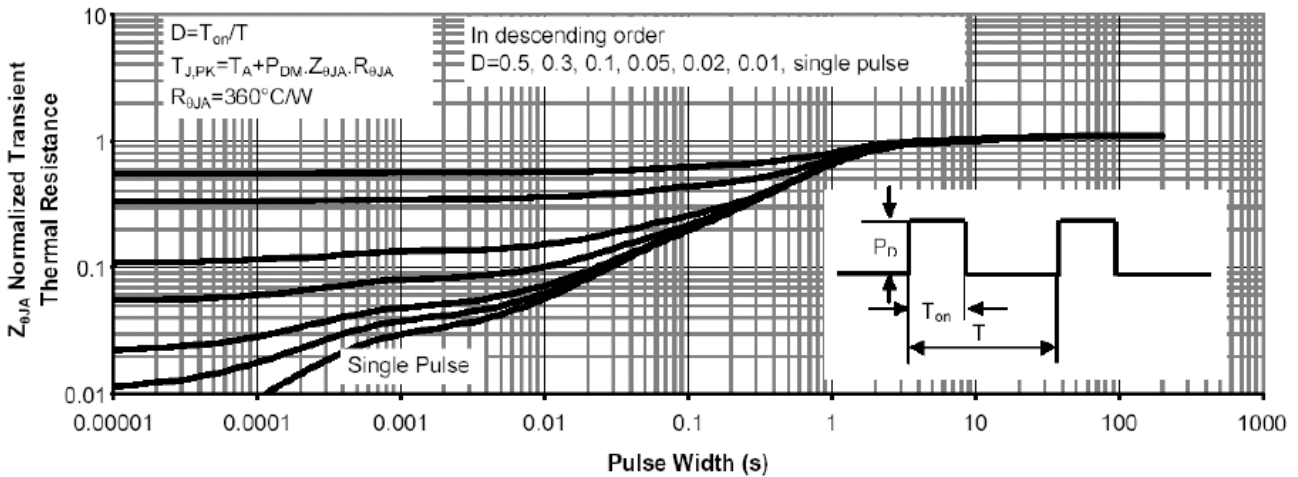
**Fig 8. Single Pulse Power Rating Junction-to-Ambient**



**Fig 9. Gate Charge Characteristics**



**Fig 10. Typical Capacitance Characteristics**



**Fig 11. Normalized Maximum Transient Thermal Impedance**