

DESCRIPTION

The 3400 uses advanced trench technology to provide excellent RDS(ON) and low gate charge. This device is suitable for use as a load switch or in PWM applications.

Product Summary

RDS(ON) <30m Ω @ VGS=10V

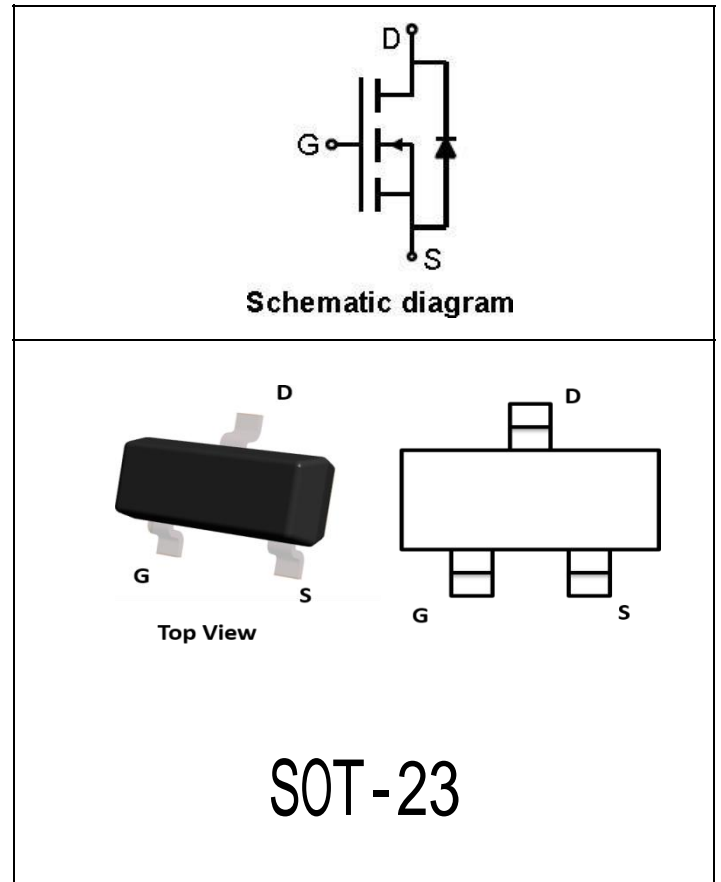
RDS(ON) <40mΩ @ VGS=4.5V

GENERAL FEATURES

- Trench Power LV MOSFET technology
- High density cell design for low RDS(ON)
- High Speed switching

Application

- Battery protection
- Load switch
- Power management



■ Absolute Maximum Ratings (T_A=25°C unless otherwise noted)

Parameter		Symbol	Limit	Unit
Drain-source Voltage		V _{DS}	30	V
Gate-source Voltage		V _{GS}	±20	V
Drain Current	T _C =25°C	I _D	5.6	A
	T _C =75°C		4.5	
Pulsed Drain Current ^A		I _{DM}	30	A
Total Power Dissipation	T _C =25°C	P _D	1.2	W
	T _C =70°C		0.9	W
Thermal Resistance Junction-to-Ambient @ Steady State B		R _{θJC}	105	°C/W
Junction and Storage Temperature Range		T _J , T _{STG}	-55~+150	°C

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

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Static Parameter						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	30			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=24V, V_{GS}=0V$	$T_J=25^\circ\text{C}$		1	μA
			$T_J=55^\circ\text{C}$		5	
Gate-Body Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$			± 100	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1.2	1.7	2.2	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_{DS}=4A$		25	30	m Ω
		$V_{GD}=4.5V, I_{DS}=3.6A$		35	40	
Diode Forward Voltage	V_{SD}	$I_S=15A, V_{GS}=0V$		0.85	1.2	V
Maximum Body-Diode Continuous Current	I_S				5.6	A
Dynamic Parameters						
Input Capacitance	C_{iss}	$V_{DS}=15V, V_{GS}=0V, f=1\text{MHz}$		300		pF
Output Capacitance	C_{oss}			80		
Reverse Transfer Capacitance	C_{rss}			65		
Switching Parameters						
Total Gate Charge at 10V	Q_g	$V_{DS}=15V, V_{GS}=4.5V, I_{DS}=5.6A$		5.2		nC
Gate-Source Charge	Q_{gs}			0.9		
Gate-Drain Charge	Q_{gd}			1.3		
Turn-on Delay Time	$t_{D(on)}$	$V_{DS}=15V, V_{GS}=8V, R_G=2.8\Omega, I_{DS}=1A$		4.5		
Turn-on Rise Time	t_{tr}			2.5		
Turn-off Delay Time	$t_{D(off)}$			14.5		
Turn-off fall Time	t_{tf}			3.5		

A. Pulse Test: Pulse Width $\leq 300\mu s$, Duty cycle $\leq 2\%$.

B. $T_J=25^\circ\text{C}$, $V_{DD}=20V$, $V_G=10V$, $L=0.5\text{mH}$, $R_g=25\Omega$

C. $R_{\theta JA}$ is the sum of the junction-to-case and case-to-ambient thermal resistance, where the case thermal reference is defined as the solder mounting surface of the drain pins. $R_{\theta JC}$ is guaranteed by design, while $R_{\theta JA}$ is determined by the board design. The maximum rating presented here is based on mounting on a 1 in 2 pad of 2oz copper.

■ Typical Performance Characteristics

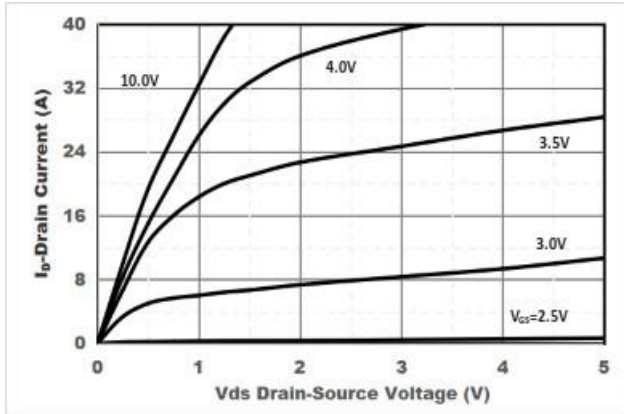


Figure1. Output Characteristics

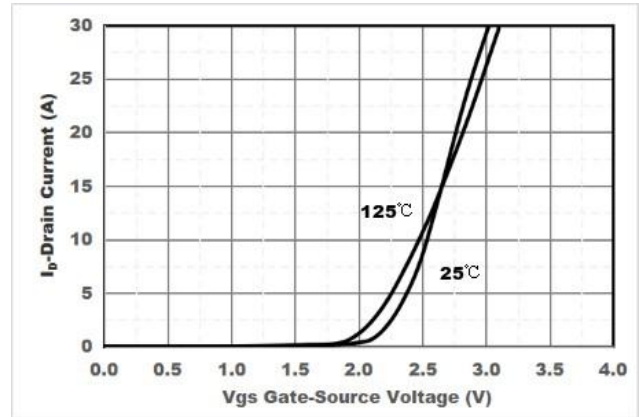


Figure2. Transfer Characteristics

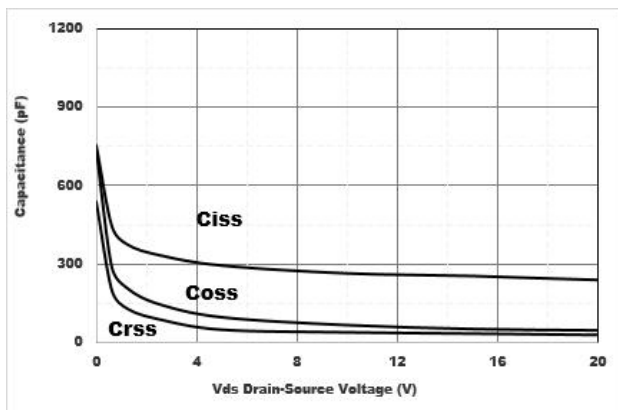


Figure3. Capacitance Characteristics

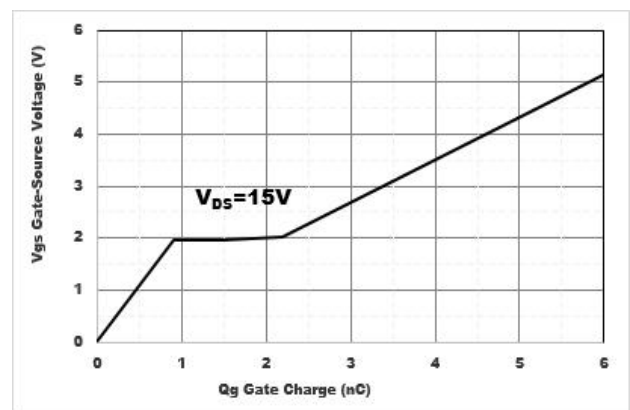


Figure4. Gate Charge

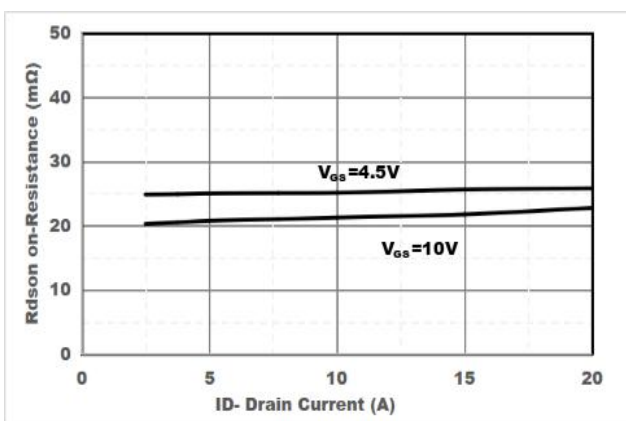


Figure5. Drain-Source on Resistance

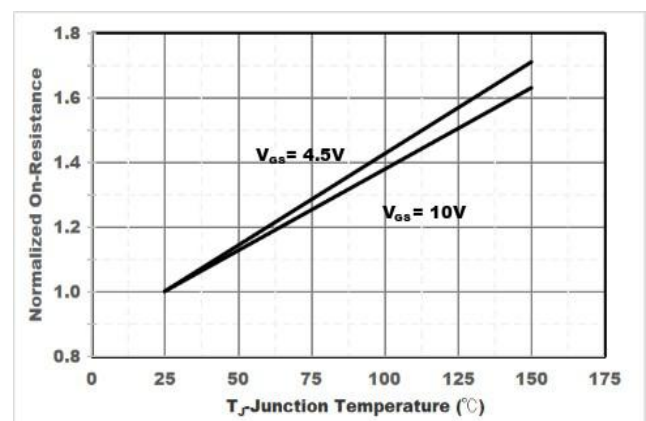


Figure6. Drain-Source on Resistance

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

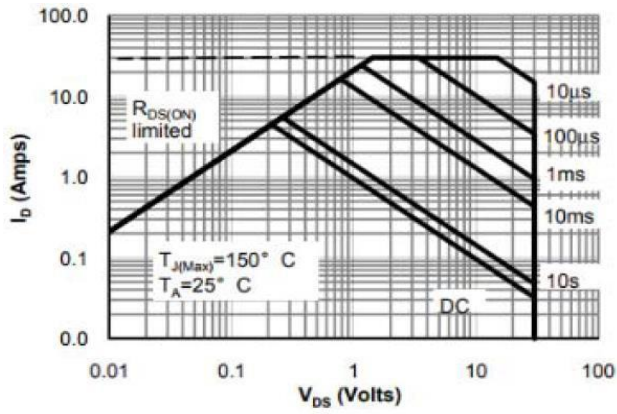


Figure7. Safe Operation Area

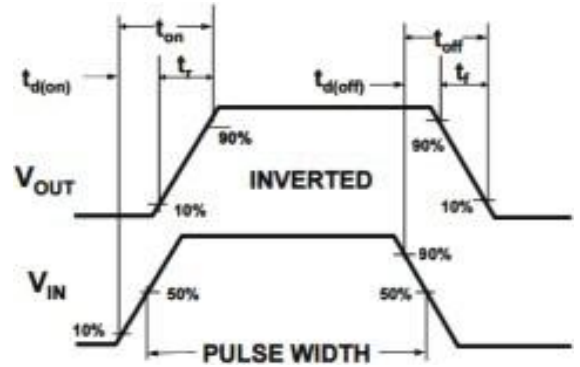
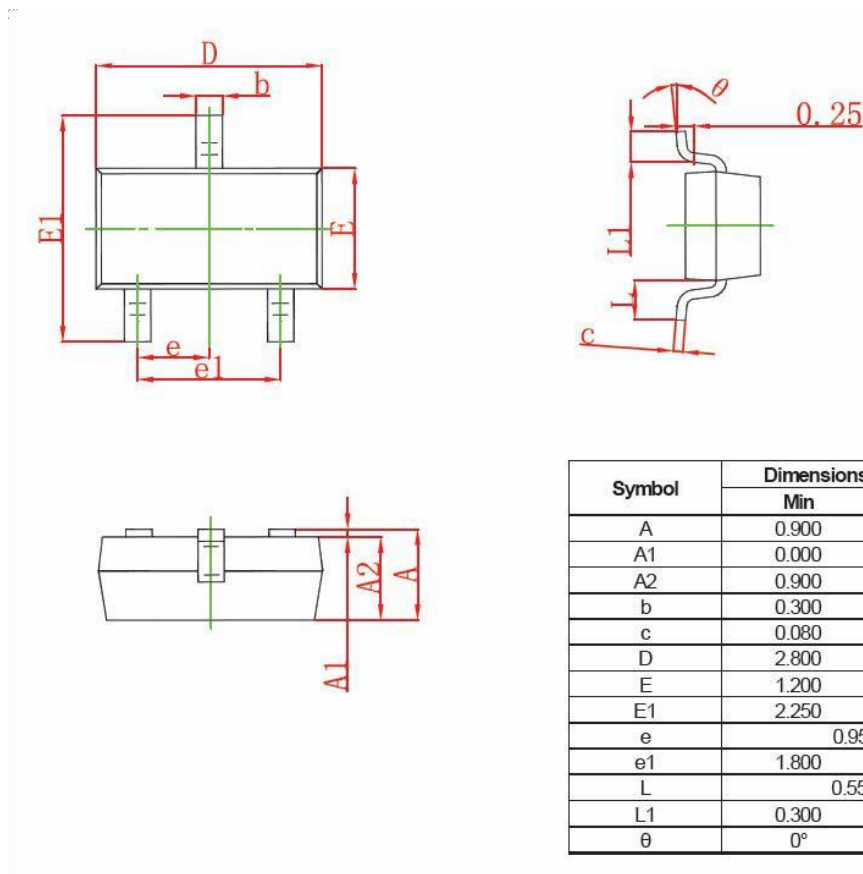


Figure8. Switching wave

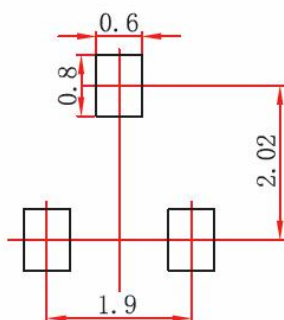
Package Information

■ SOT-23 Package information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP		0.037 TYP	
e1	1.800	2.000	0.071	0.079
L	0.550 REF		0.022 REF	
L1	0.300	0.500	0.012	0.020
θ	0°	8°	0°	8°

■ SOT-23 Suggested Pad Layout



- Note:
1. Controlling dimension: in millimeters.
 2. General tolerance: $\pm 0.05\text{mm}$.
 3. The pad layout is for reference purposes only.