

WS4632C

28mΩ, 100nA Quiescent current, 100nA standby current, Slew Rate Control Driver and Ultra Small Package Load Switch

Descriptions

The WS4632C is a single channel load switch with ultra-low on resistance MOSFET. It is designed for load switching applications with ultra-low quiescent current (100nA) and ultra-low standby current (100nA). The device is controlled by external logic pin, allowing optimization of battery life, and portable device autonomy.

The WS4632C contains a P-channel MOSFET that can operate over an input voltage range of 1.1V to 5.5V and can support a maximum continuous current of 2A.

The WS4632C are available in a small 0.79 x 0.79 mm CSP-4L package. Standard products are Pb-free and Halogen-free.

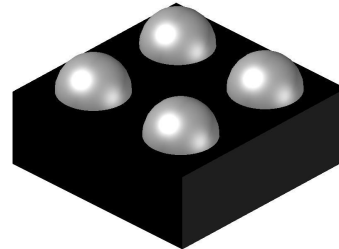
Features

- Input Voltage Range : 1.1V~5.5V
- Main switch Ron : 28mΩ@VIN=5.5V
- Maximum Output current : 2A.
- Quiescent current : 100nA @ Typ
- Standby current : 100nA @ Typ
- Recommend capacitor : CIN=1μF
: COUT=0.1μF
- Active High EN Pin
- CSP-4L 0.79 x 0.79 mm

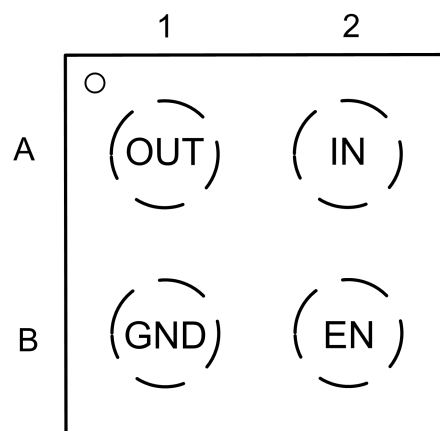
Applications

- MP3/MP4 Players
- Cellphones, radiophone, digital cameras
- Bluetooth, wireless handsets
- Others portable electronic device

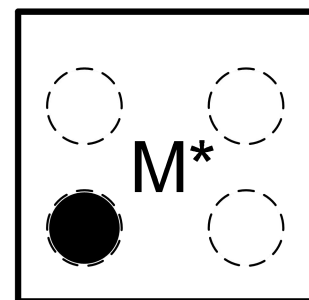
[Http://www.sh-willsemi.com](http://www.sh-willsemi.com)



CSP-4L



Pin Configuration (Top View)



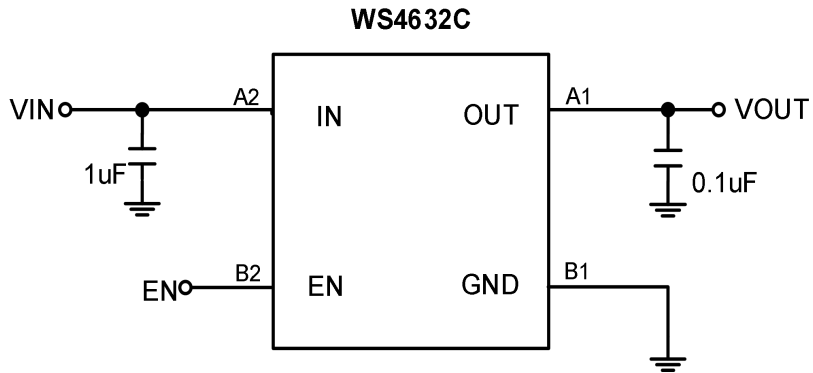
Marking (Top View)

M=WS4632C

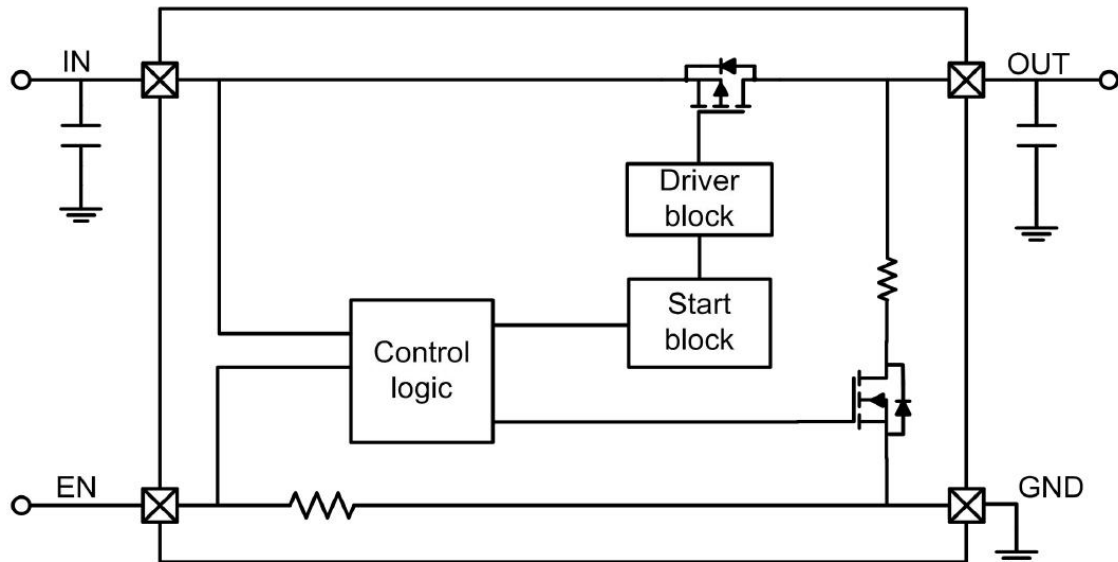
*:=Month Code

Order information

Device	Marking	Package	Shipping
WS4632C-4/TR	M*	CSP-4L	3000/Reel&Tape

Typical Application

Pin Description

PIN	Symbol	Description
A1	OUT	Output pin
A2	IN	Input pin
B1	GND	Ground
B2	EN	Enable (Active high)

Block Diagram


Absolute Maximum Ratings

Parameter	Value	Unit	
V _{IN} Range	-0.3~6.5	V	
V _{EN} Range	-0.3~6.5	V	
V _{OUT} Range	-0.3~V _{IN} +0.3	V	
Storage Temperature Range	-40 ~ 150	°C	
Junction Temperature Range	-40 ~ 125	°C	
Lead Temperature	260	°C	
Moisture Sensitivity	Level-1		
ESD Ratings	HBM	8000	V
	CDM	2000	V

Recommend Operating Ratings

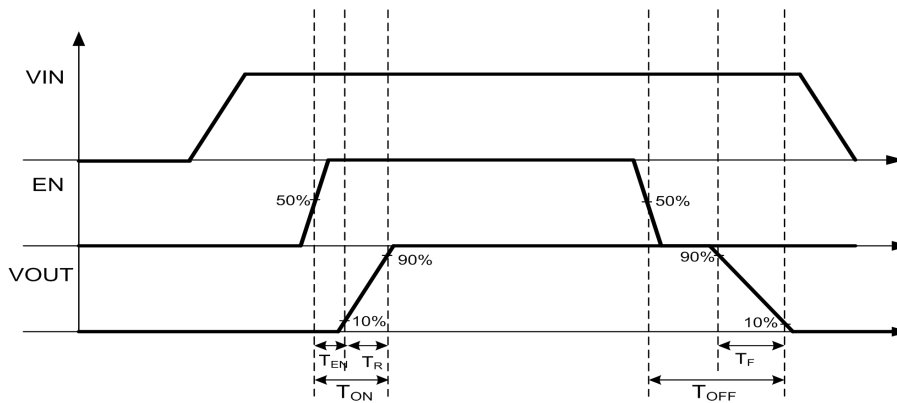
Parameter	Value	Unit
Operating Power voltage	1.1~5.5	V
Enable Voltage	0~5.5	V
Maximum DC current	2	A
Operating ambient temperature	-40~85	°C
Operating Junction temperature	-40~125	°C
Decoupling input capacitor	1	uF
Decoupling output capacitor	0.1	uF
Power Dissipation Rating(25 °C, CSP-4L)	0.4	W
Power Dissipation Rating(85 °C, CSP-4L)	0.16	W
Thermal Resistance, R _{θJA} (CSP-4L) ^{*1}	180	°C/W

*1:Surface mounted on FR-4 Board using 2 oz, 1 square inch Cu area, PCB board size 1.5*1.5 square inches.

Electronics Characteristics

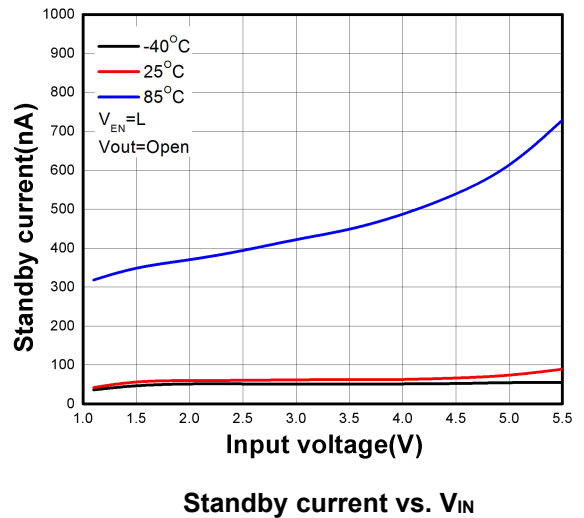
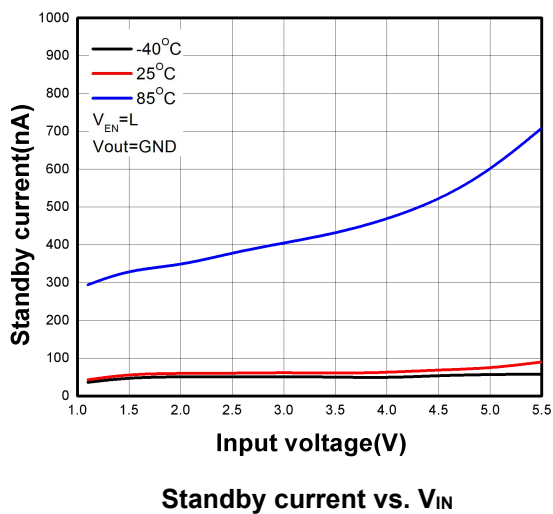
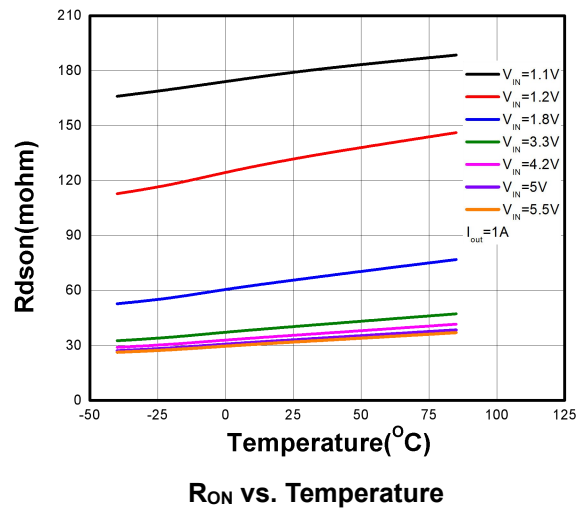
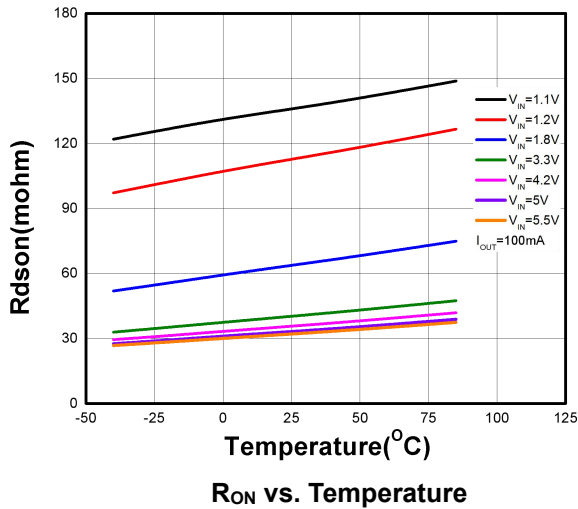
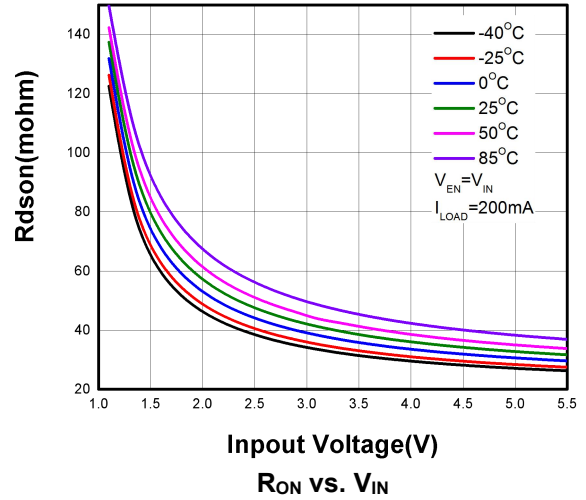
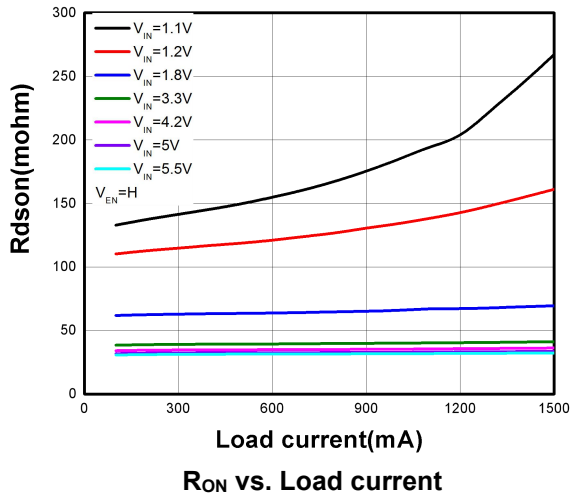
 (Ta=25°C, V_{IN}=5 V, C_{IN}=1μF, C_{OUT}=0.1μF, unless otherwise noted)

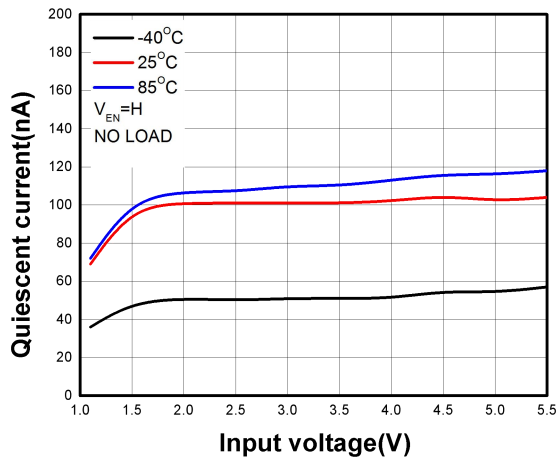
Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Input Voltage	V _{IN}		1.1		5.5	V
Static drain-source on-state resistance	R _{DSON}	V _{IN} =5.5V, I _{OUT} =500mA		28	42	mΩ
		V _{IN} =5.0V, I _{OUT} =500mA		29	44	
		V _{IN} =4.2V, I _{OUT} =500mA		31	48	
		V _{IN} =3.3V, I _{OUT} =500mA		36	50	
		V _{IN} =1.8V, I _{OUT} =500mA		60	79	
		V _{IN} =1.2V, I _{OUT} =200mA		107	144	
		V _{IN} =1.1V, I _{OUT} =200mA		131	190	
EN logic high voltage	V _{ENH}		0.9			V
EN logic low voltage	V _{ENL}				0.4	
EN pull down resistor	R _{PD}			8.5		MΩ
Discharge on resistance	R _{SD}			100		Ω
Standby current	I _{STD}	V _{IN} =5.5V, EN=Low, No load		100	1000	nA
Quiescent current	I _Q	V _{IN} =5.5V, EN=High, No load		100	200	nA
ON time	T _{ON}	V _{IN} =3.3V, RL=500ohm		230		μs
Output rise time	T _R	V _{IN} =3.3V, RL=500ohm		136		μs
OFF time	T _{OFF}	V _{IN} =3.3V, RL=500ohm		27		μs
Output fall time	T _F	V _{IN} =3.3V, RL=500ohm		25		μs

TIMINGS


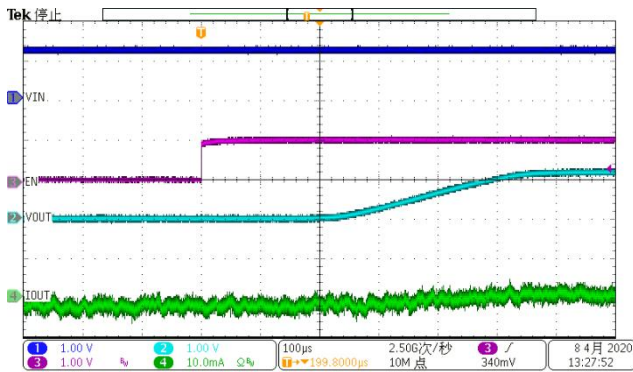
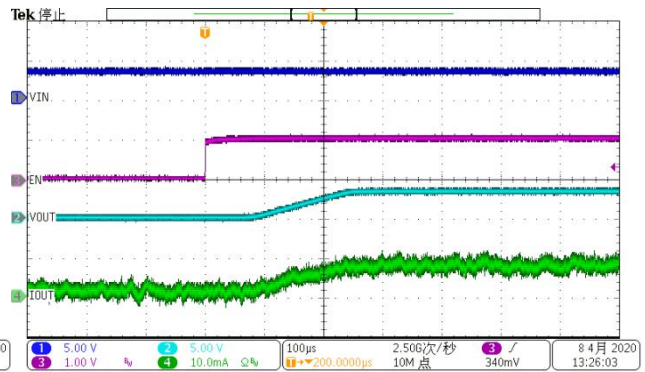
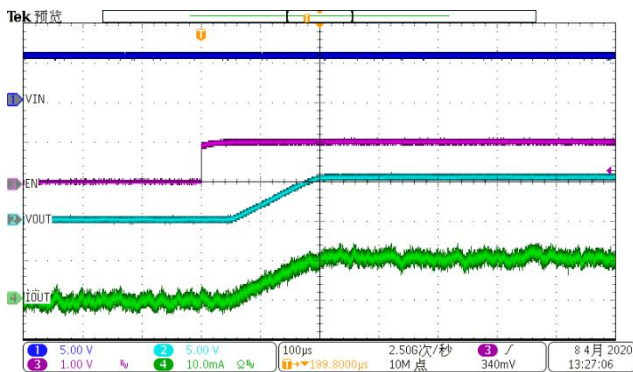
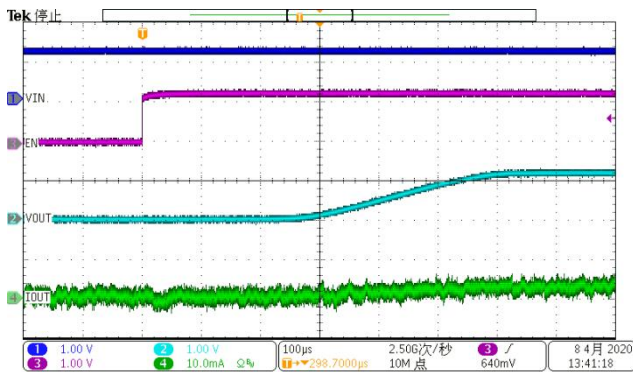
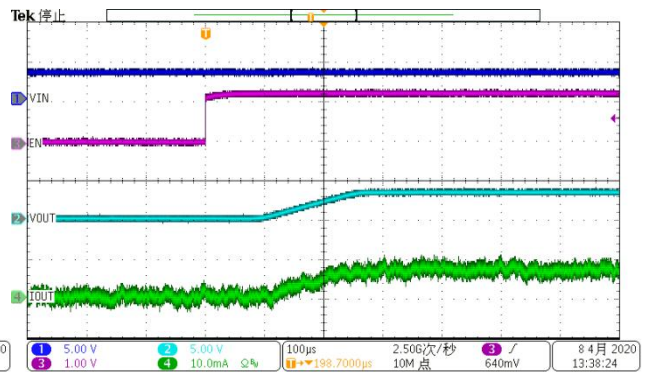
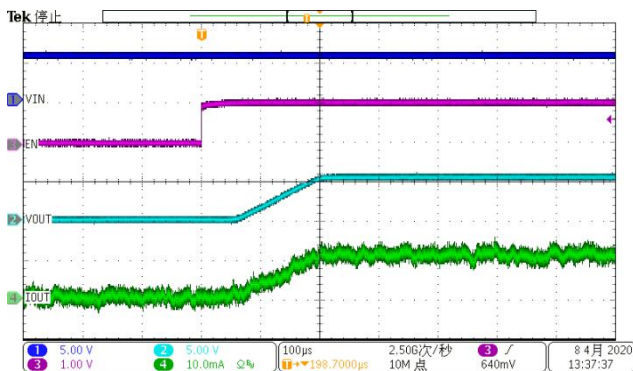
Enable, rise and fall

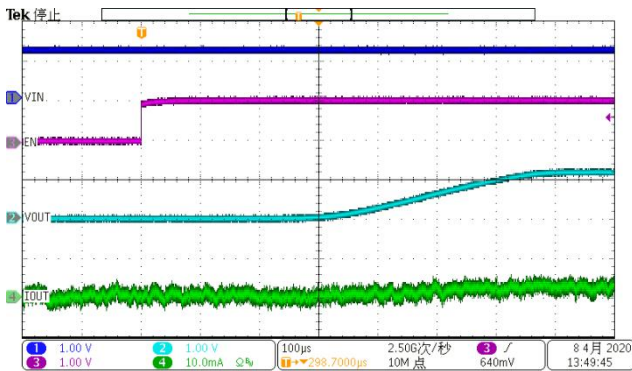
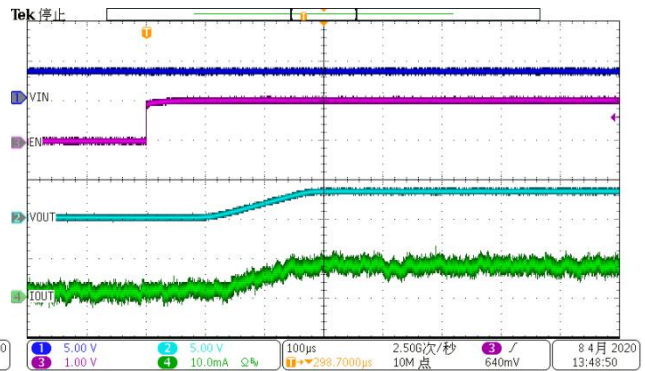
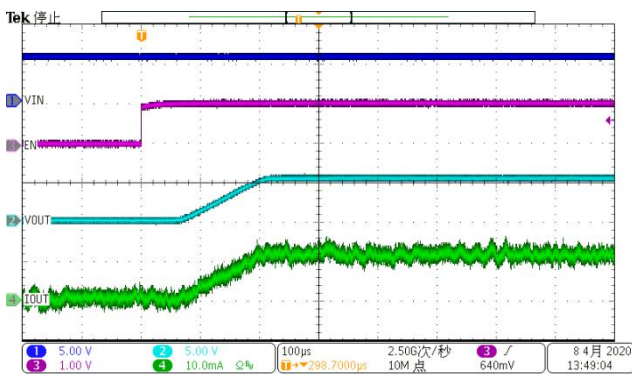
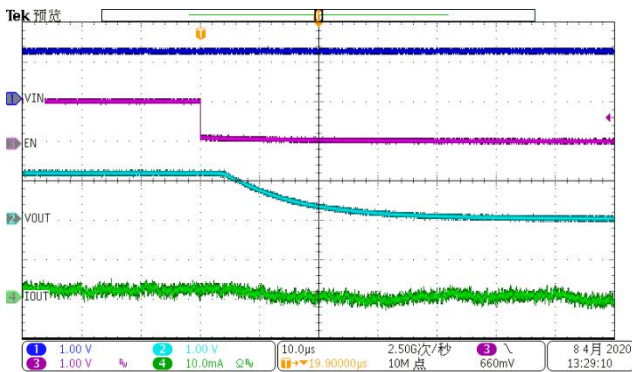
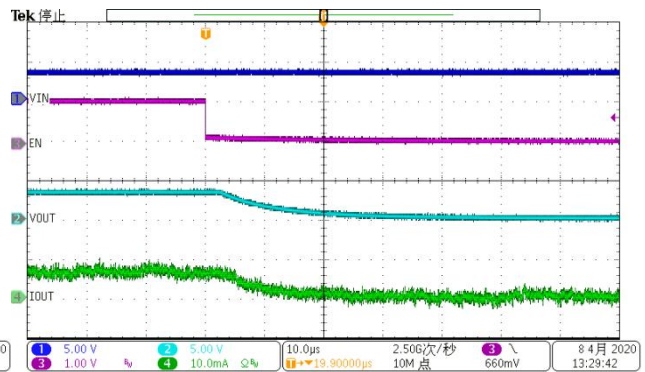
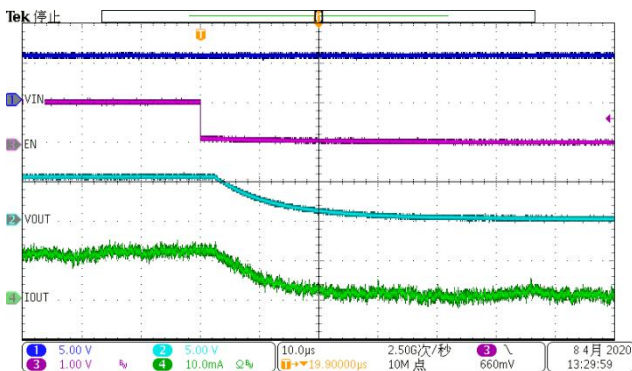
Typical characteristics (Ta=25°C, V_{IN}=5V, I_{OUT}=500mA, C_{IN}=1μF, C_{OUT}=0.1μF, unless otherwise noted)

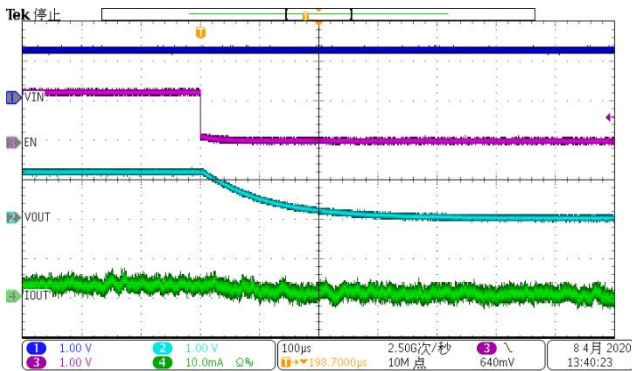
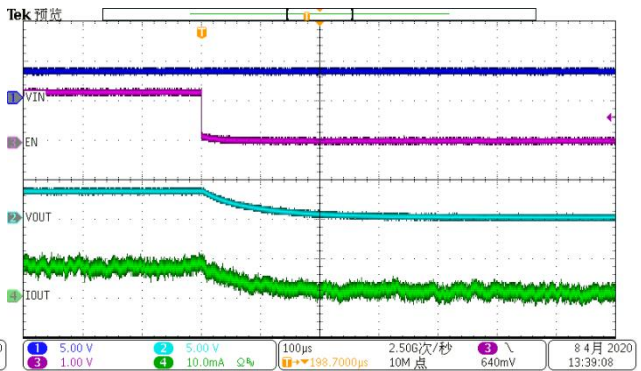
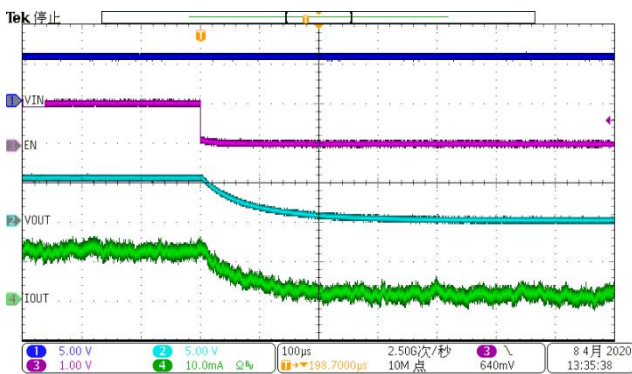
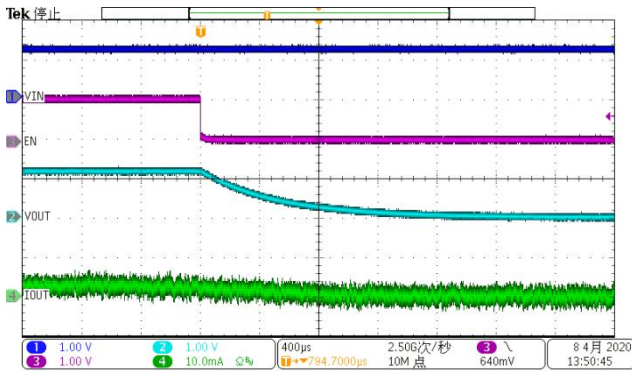
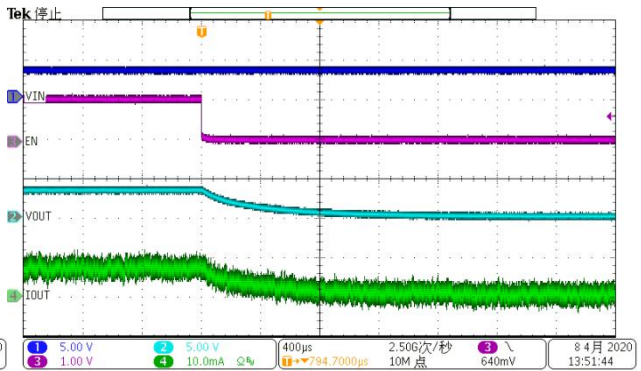
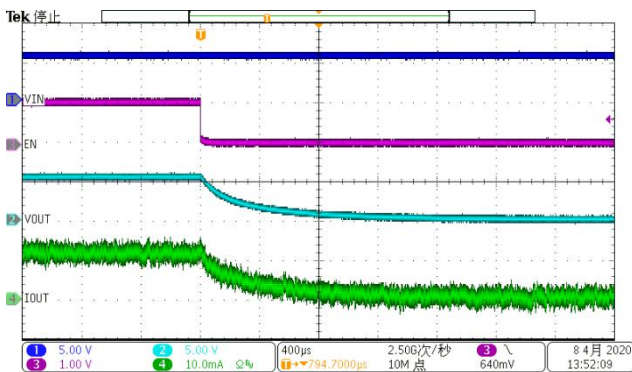


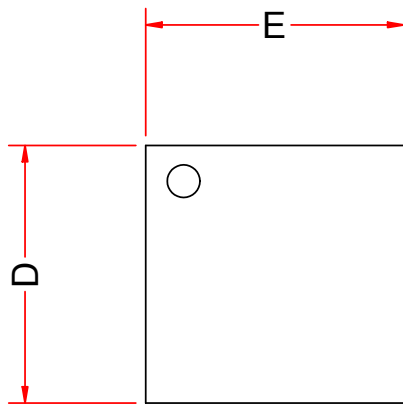
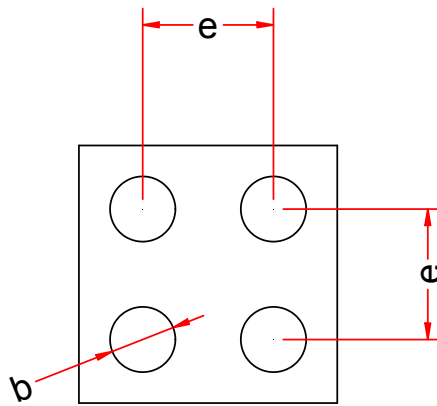
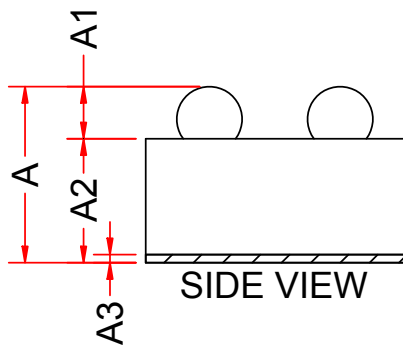
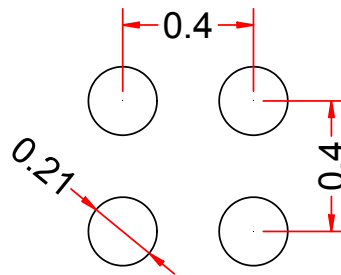


Quiescent current vs. V_{IN}

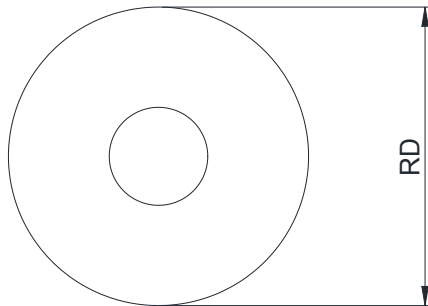
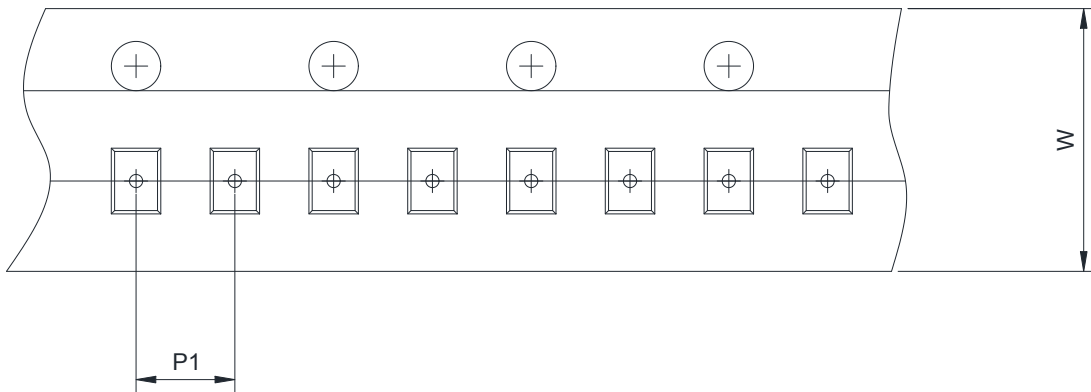
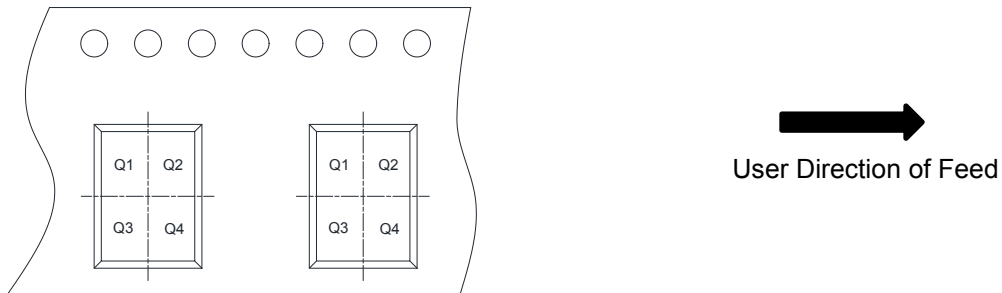
Turn on transient
Cin=1uF,Cout=0.1uF, R_{LOAD}=500Ω,VIN=1.2V

Cin=1uF,Cout=0.1uF, R_{LOAD}=500Ω,VIN=3.3V

Cin=1uF,Cout=0.1uF, R_{LOAD}=500Ω,VIN=5.5V

Cin=1uF,Cout=1uF, R_{LOAD}=500Ω,VIN=1.2V

Cin=1uF,Cout=1uF, R_{LOAD}=500Ω,VIN=3.3V

Cin=1uF,Cout=1uF, R_{LOAD}=500Ω,VIN=5.5V


Cin=1uF,Cout=4.7uF, R_{LOAD}=500Ω,VIN=1.2V

Cin=1uF,Cout=4.7uF, R_{LOAD}=500Ω,VIN=3.3V

Cin=1uF,Cout=4.7uF, R_{LOAD}=500Ω,VIN=5.5V

Turn off transient
Cin=1uF,Cout=0.1uF, R_{LOAD}=500Ω,VIN=1.2V

Cin=1uF,Cout=0.1uF, R_{LOAD}=500Ω,VIN=3.3V

Cin=1uF,Cout=0.1uF, R_{LOAD}=500Ω,VIN=5.5V


Cin=1uF,Cout=1uF, R_{LOAD}=500Ω, VIN=1.2V

Cin=1uF,Cout=1uF, R_{LOAD}=500Ω, VIN=3.3V

Cin=1uF,Cout=1uF, R_{LOAD}=500Ω, VIN=5.5V

Cin=1uF,Cout=4.7uF, R_{LOAD}=500Ω, VIN=1.2V

Cin=1uF,Cout=4.7uF, R_{LOAD}=500Ω, VIN=3.3V

Cin=1uF,Cout=4.7uF, R_{LOAD}=500Ω, VIN=5.5V


PACKAGE OUTLINE DIMENSIONS
CSP-4L

TOP VIEW

BOTTOM VIEW

SIDE VIEW

RECOMMENDED LAND PATTERN(unit:mm)

Symbol	Dimensions in Millimeters		
	Min.	Typ.	Max.
A	0.50	0.55	0.60
A1	0.14	0.17	0.19
A2	0.36	0.38	0.41
A3	0.025REF		
D	0.76	0.79	0.82
E	0.76	0.79	0.82
e	0.40 BSC		
b	0.18	0.20	0.23

TAPE AND REEL INFORMATION
Reel Dimensions

Tape Dimensions

Quadrant Assignments For PIN1 Orientation In Tape


RD	Reel Dimension	<input checked="" type="checkbox"/> 7inch	<input type="checkbox"/> 13inch
W	Overall width of the carrier tape	<input checked="" type="checkbox"/> 8mm	<input type="checkbox"/> 12mm <input type="checkbox"/> 16mm
P1	Pitch between successive cavity centers	<input type="checkbox"/> 2mm	<input checked="" type="checkbox"/> 4mm <input type="checkbox"/> 8mm
Pin1	Pin1 Quadrant	<input checked="" type="checkbox"/> Q1	<input type="checkbox"/> Q2 <input type="checkbox"/> Q3 <input type="checkbox"/> Q4