

EVVOSEMI[®]

THINK CHANGE DO



ESD



TVS



MOS



LDO



Diode



Sensor



DC-DC

Product Specification

▶ Domestic	Part Number	SI4401BDY
▶ Overseas	Part Number	SI4401BDY
▶ Equivalent	Part Number	SI4401BDY

EV is the abbreviation of name EVVO

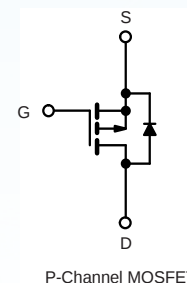
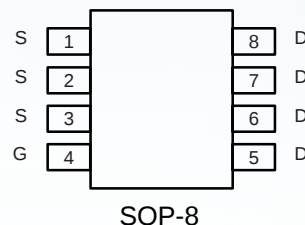
P-Channel MOSFET

PRODUCT SUMMARY

- $V_{DS} (V) = -40V$
- $R_{DS(ON)} < 18m\Omega$ ($V_{GS} = -10V$)
- $R_{DS(ON)} < 29m\Omega$ ($V_{GS} = -4.5V$)

APPLICATIONS

- Load Switch
- POL

ABSOLUTE MAXIMUM RATINGS $T_A = 25\text{ }^{\circ}\text{C}$, unless otherwise noted

Parameter		Symbol	Limit	Unit
Drain-Source Voltage		V_{DS}	- 40	V
Gate-Source Voltage		V_{GS}	± 20	
Continuous Drain Current ($T_J = 150\text{ }^{\circ}\text{C}$)	$T_C = 25\text{ }^{\circ}\text{C}$	I_D	- 16.1	A
	$T_C = 70\text{ }^{\circ}\text{C}$		- 12.9	
	$T_A = 25\text{ }^{\circ}\text{C}$		- 10.2 ^{b, c}	
	$T_A = 70\text{ }^{\circ}\text{C}$		- 8.2 ^{b, c}	
Pulsed Drain Current		I_{DM}	- 50	
Continuous Source-Drain Diode Current	$T_C = 25\text{ }^{\circ}\text{C}$	I_S	- 5.3	
	$T_A = 25\text{ }^{\circ}\text{C}$		- 2.1 ^{b, c}	
Single Pulse Avalanche Current	L = 0.1 mH	I_{AS}	- 28	mJ
Single Pulse Avalanche Energy		E_{AS}	39	
Maximum Power Dissipation	$T_C = 25\text{ }^{\circ}\text{C}$	P_D	6.3	W
	$T_C = 70\text{ }^{\circ}\text{C}$		4	
	$T_A = 25\text{ }^{\circ}\text{C}$		2.5 ^{b, c}	
	$T_A = 70\text{ }^{\circ}\text{C}$		1.6 ^{b, c}	
Operating Junction and Storage Temperature Range		T_J, T_{stg}	- 55 to 150	$^{\circ}\text{C}$

THERMAL RESISTANCE RATINGS

Parameter		Symbol	Typical	Maximum	Unit
Maximum Junction-to-Ambient ^{b, d}	$t \leq 10\text{ s}$	R_{thJA}	37	50	$^{\circ}\text{C/W}$
Maximum Junction-to-Foot (Drain)	Steady State	R_{thJF}	16	20	

Notes:

a. Based on $T_C = 25\text{ }^{\circ}\text{C}$.

b. Surface mounted on 1" x 1" FR4 board.

c. $t = 10\text{ s}$.d. Maximum under steady state conditions is $85\text{ }^{\circ}\text{C/W}$.

P-Channel MOSFET

SPECIFICATIONS $T_J = 25\text{ }^{\circ}\text{C}$, unless otherwise noted

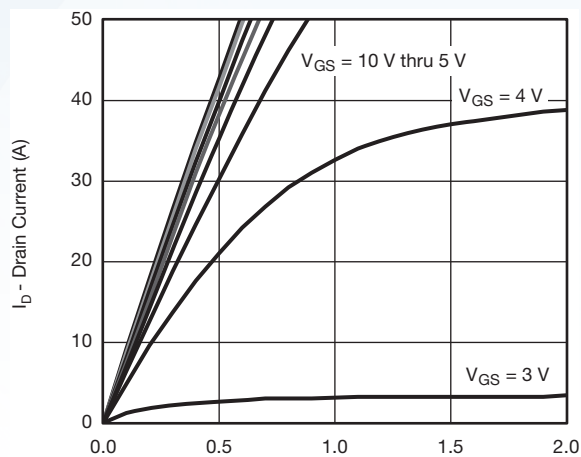
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Static						
Drain-Source Breakdown Voltage	V _{DS}	V _{GS} = 0 V, I _D = - 250 μA	- 40			V
V _{DS} Temperature Coefficient	ΔV _{DS} /T _J	μA		- 36		mV/°C
V _{GS(th)} Temperature Coefficient	ΔV _{GS(th)} /T _J			5		
Gate-Source Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = - 250 μA	- 1.2		- 2.5	V
Gate-Source Leakage	I _{GSS}	V _{DS} = 0 V, V _{GS} = ± 20 V			± 100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = - 40 V, V _{GS} = 0 V			- 1	μA
		V _{DS} = - 40 V, V _{GS} = 0 V, T _J = 55 °C			- 5	
On-State Drain Current ^a	I _{D(on)}	V _{DS} ≤ - 5 V, V _{GS} = - 10 V	- 25			A
Drain-Source On-State Resistance ^a	R _{DS(on)}	V _{GS} = - 10 V, I _D = - 10.2 A			18	mΩ
		V _{GS} = - 4.5 V, I _D = - 8.4 A			29	
Forward Transconductance ^a	g _{fs}	V _{DS} = - 15 V, I _D = - 10.2 A		37		S
Dynamic ^b						
Input Capacitance	C _{iss}	V _{DS} = - 20 V, V _{GS} = 0 V, f = 1 MHz		3007		pF
Output Capacitance	C _{oss}			335		
Reverse Transfer Capacitance	C _{rss}			291		
Total Gate Charge	Q _g	V _{DS} = - 20 V, V _{GS} = - 10 V, I _D = - 10.2 A		64	95	nC
		V _{DS} = - 20 V, V _{GS} = - 4.5 V, I _D = - 10.2 A		33	50	
Gate-Source Charge	Q _{gs}			9.8		
Gate-Drain Charge	Q _{gd}			15.7		
Gate Resistance	R _g	f = 1 MHz	0.4	2	4	Ω
Turn-On Delay Time	t _{d(on)}	V _{DD} = - 20 V, R _L = 2.4 Ω I _D ≅ - 8.2 A, V _{GEN} = - 4.5 V, R _g = 1 Ω		57	86	ns
Rise Time	t _r			50	75	
Turn-Off Delay Time	t _{d(off)}			40	60	
Fall Time	t _f			17	26	
Turn-On Delay Time	t _{d(on)}	V _{DD} = - 20 V, R _L = 2.4 Ω I _D ≅ - 8.2 A, V _{GEN} = - 10 V, R _g = 1 Ω		13	20	
Rise Time	t _r			11	20	
Turn-Off Delay Time	t _{d(off)}			45	68	
Fall Time	t _f			9	18	
Drain-Source Body Diode Characteristics						
Continuous Source-Drain Diode Current	I _S	T _C = 25 °C			- 5.3	A
Pulse Diode Forward Current	I _{SM}				- 50	
Body Diode Voltage	V _{SD}	I _S = - 8.2 A, V _{GS} = 0 V		- 0.8	- 1.2	V
Body Diode Reverse Recovery Time	t _{rr}	I _F = - 8.2 A, dI/dt = 100 A/μs, T _J = 25 °C		36	54	ns
Body Diode Reverse Recovery Charge	Q _{rr}			41	62	nC
Reverse Recovery Fall Time	t _a			20		ns
Reverse Recovery Rise Time	t _b			16		

Notes:

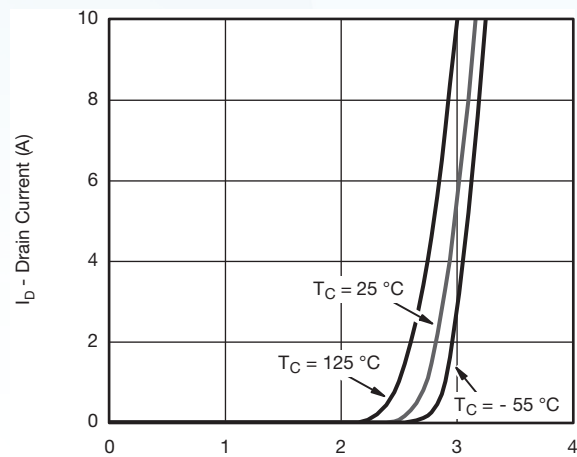
a. Pulse test; pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$.

b. Guaranteed by design, not subject to production testing.

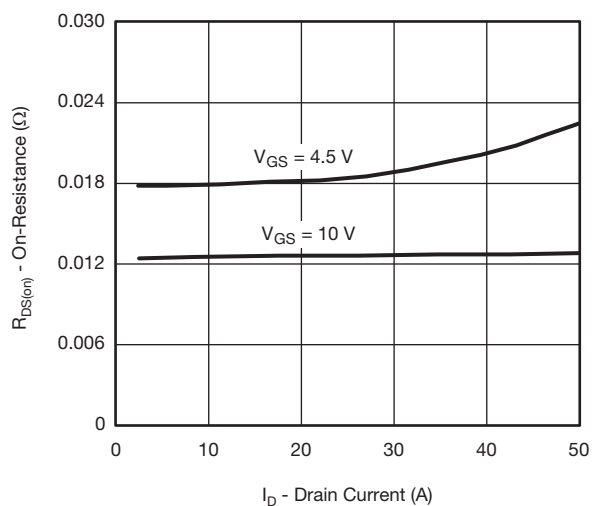
P-Channel MOSFET

TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted

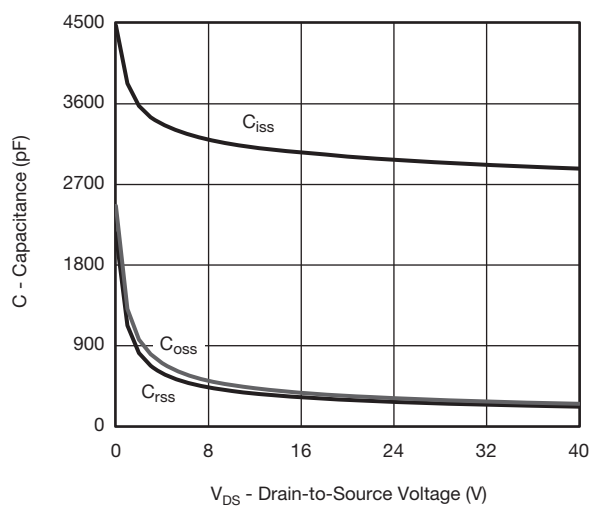
Output Characteristics



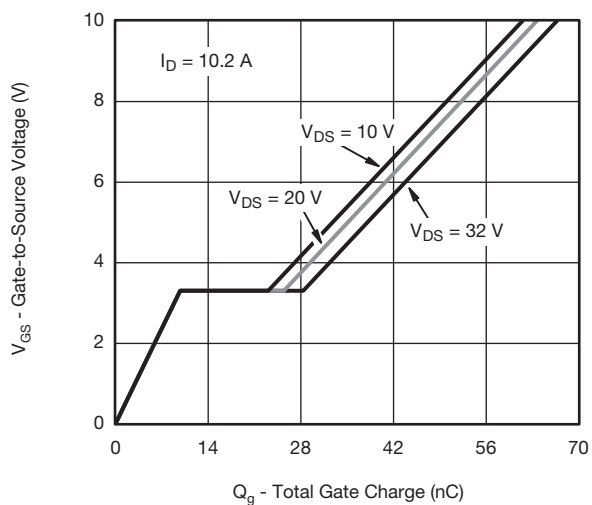
Transfer Characteristics



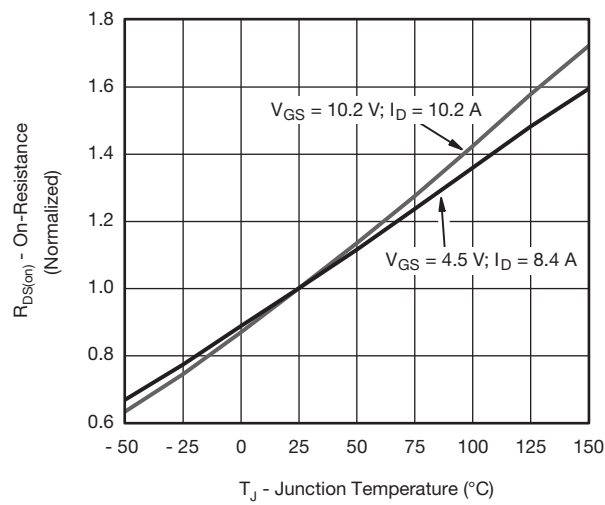
On-Resistance vs. Drain Current



Capacitance

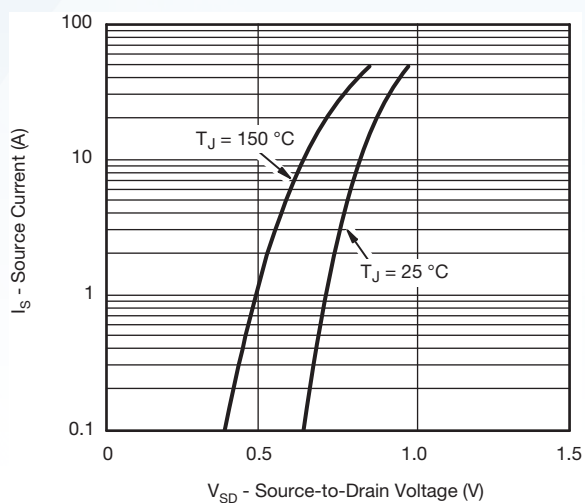


Gate Charge

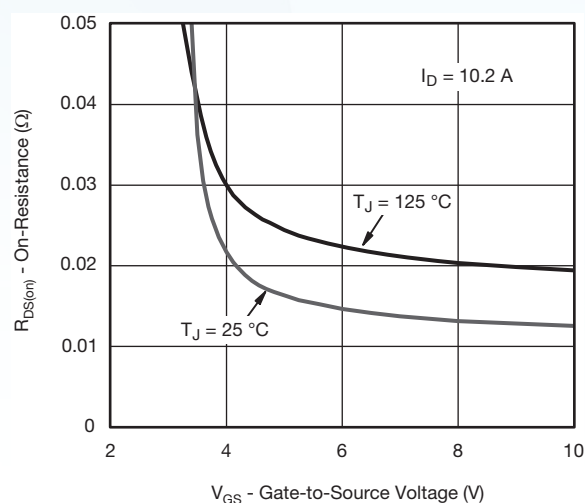


On-Resistance vs. Junction Temperature

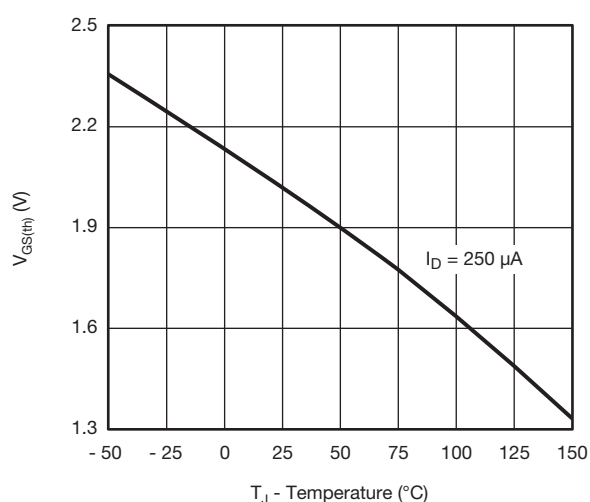
P-Channel MOSFET

TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted

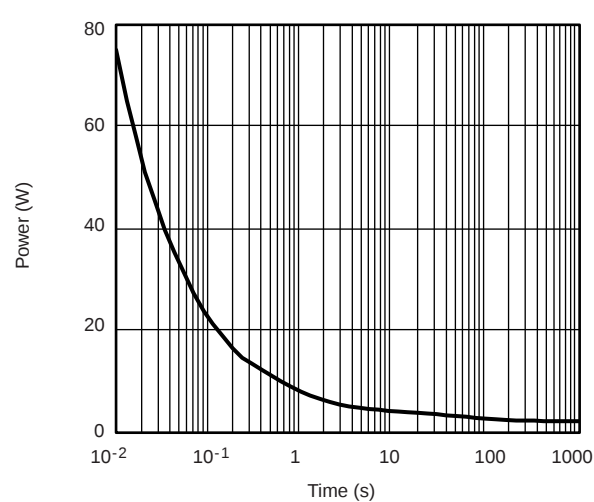
Source-Drain Diode Forward Voltage



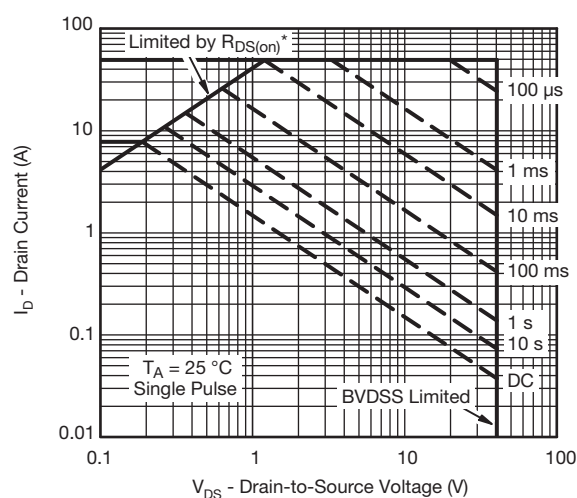
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage



Single Pulse Power (Junction-to-Ambient)

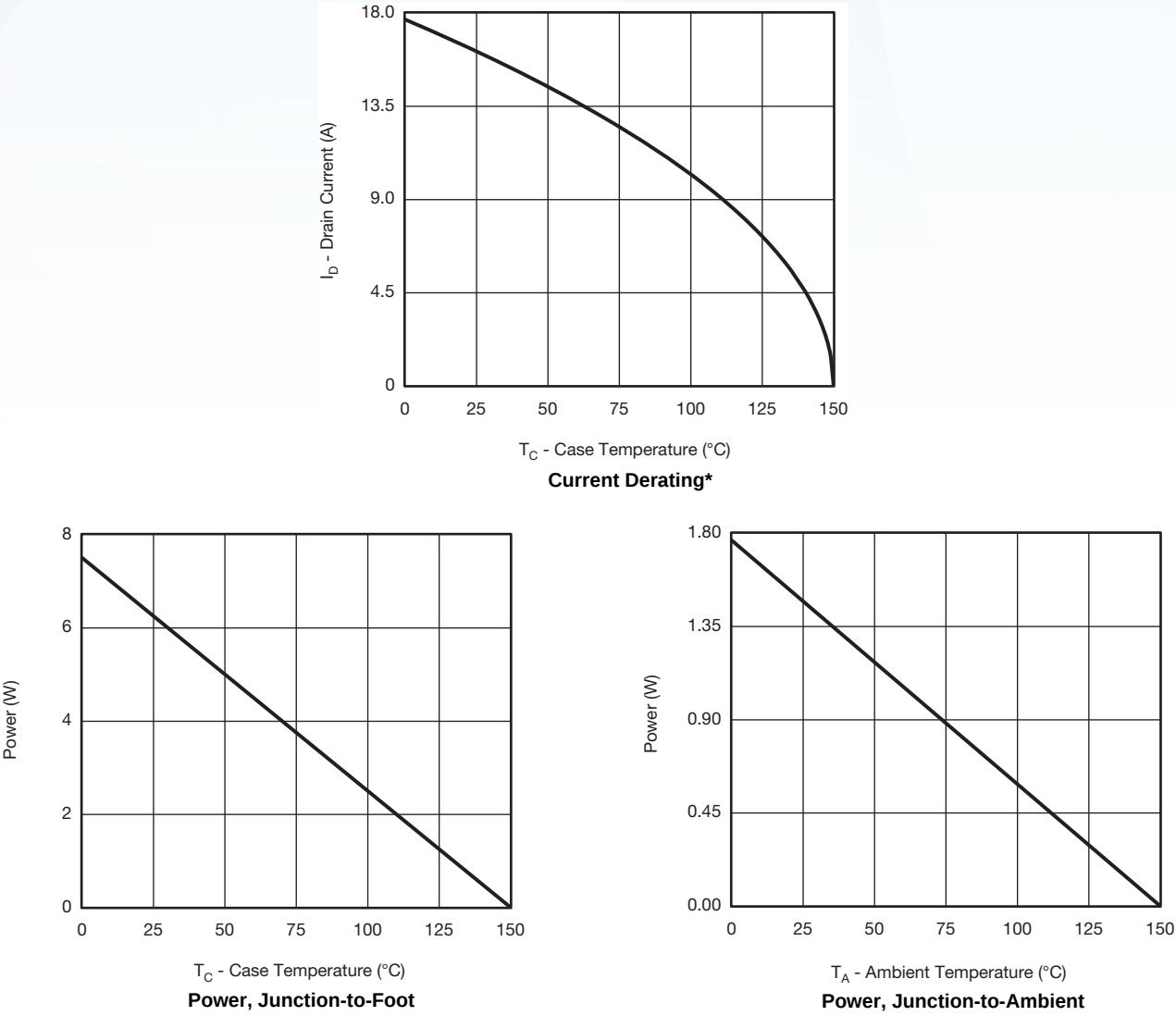


* $V_{GS} >$ minimum V_{GS} at which $R_{DS(on)}$ is specified

Safe Operating Area, Junction-to-Ambient

P-Channel MOSFET

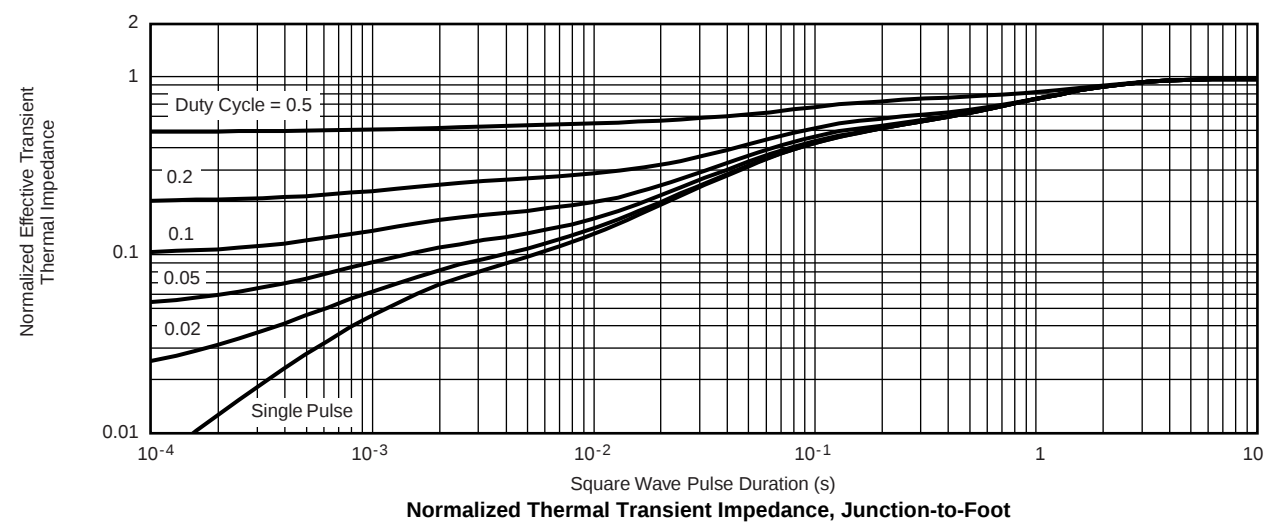
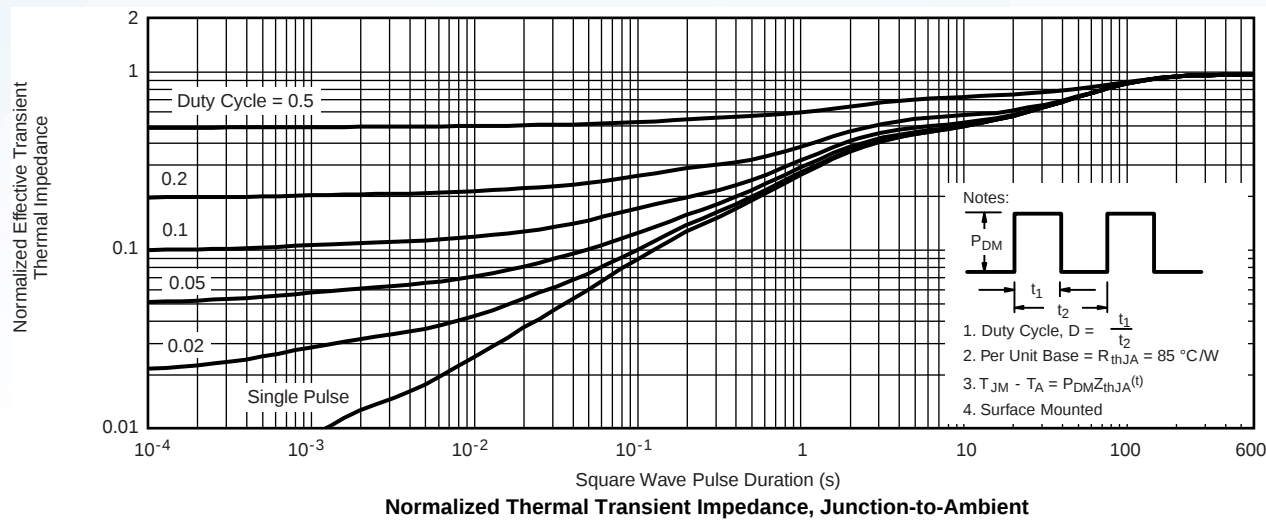
TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



* The power dissipation P_D is based on $T_{J(max)} = 150$ °C, using junction-to-case thermal resistance, and is more useful in settling the upper dissipation limit for cases where additional heatsinking is used. It is used to determine the current rating, when this rating falls below the package limit.

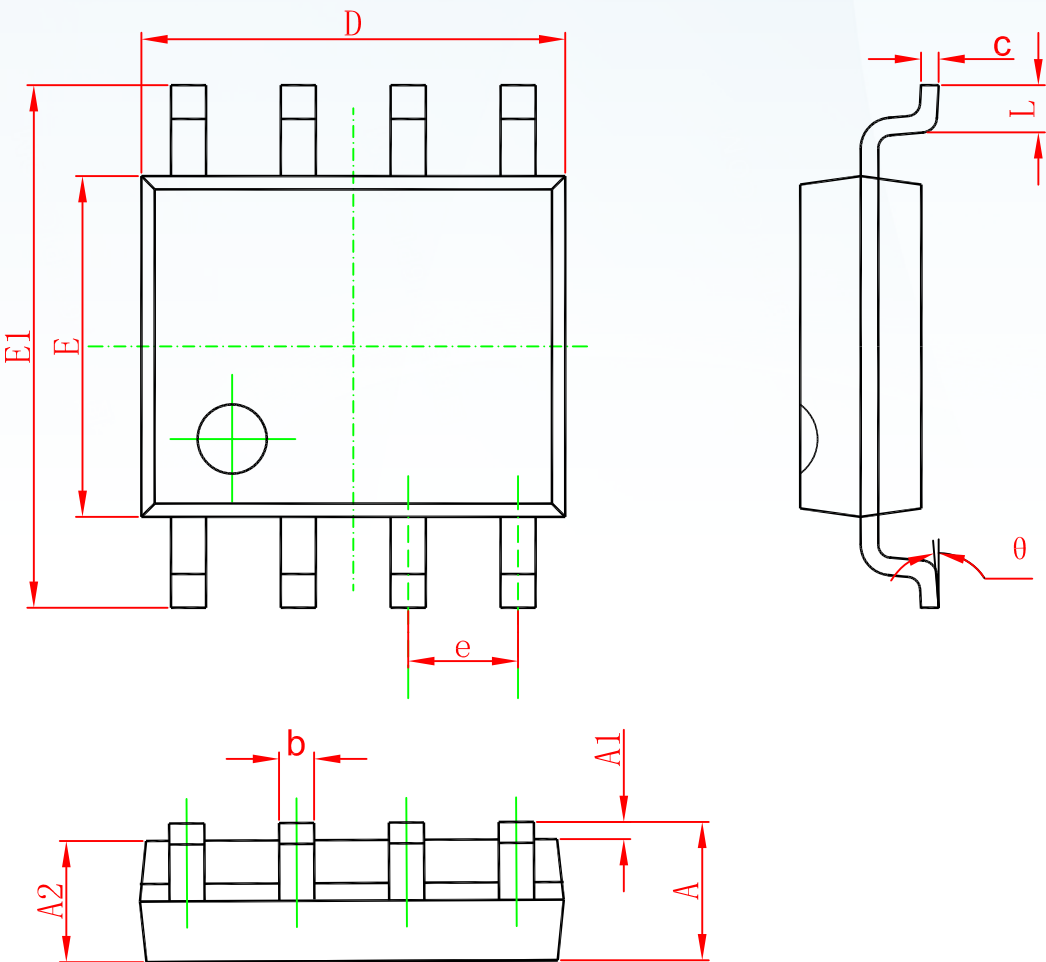
P-Channel MOSFET

TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



P-Channel MOSFET

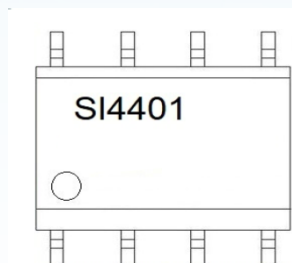
SOP-8



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.006	0.010
D	4.700	5.100	0.185	0.200
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
e	1.270(BSC)		0.050(BSC)	
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°

P-Channel MOSFET

Marking



Ordering information

Order code	Package	Baseqty	Deliverymode
SI4401BDY	SOP-8	3000	Tape and reel

Disclaimer

EVVOSEMI ("EVVO") reserves the right to make corrections, enhancements, improvements, and other changes to its products and services at any time, and to discontinue any product or service without notice.

EVVO warrants the performance of its hardware products to the specifications applicable at the time of sale in accordance with its standard warranty. Testing and other quality control techniques are used as deemed necessary by EVVO to support this warranty. Except where mandated by government requirements, testing of all parameters of each product is not necessarily performed.

Customers should obtain and confirm the latest product information and specifications before final design, purchase, or use. EVVO makes no warranty, representation, or guarantee regarding the suitability of its products for any particular purpose, nor does EVVO assume any liability for application assistance or customer product design. EVVO does not warrant or accept any liability for products that are purchased or used for any unintended or unauthorized application.

EVVO products are not authorized for use as critical components in life support devices or systems without the express written approval of EVVOSEMI.

The EVVO logo and EVVOSEMI are trademarks of EVVOSEMI or its subsidiaries in relevant jurisdictions. EVVO reserves the right to make changes without further notice to any products herein.