

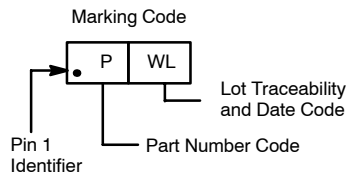
Load Switch with Level-Shift



Pb-free
Available

PRODUCT SUMMARY		
V_{DS2} (V)	$r_{DS(on)}$ (Ω)	I_D (A)
1.8 to 8	0.625 @ $V_{IN} = 4.5$ V	± 0.43
	0.890 @ $V_{IN} = 2.5$ V	± 0.36
	1.25 @ $V_{IN} = 1.8$ V	± 0.3

MARKING CODE



DESCRIPTION

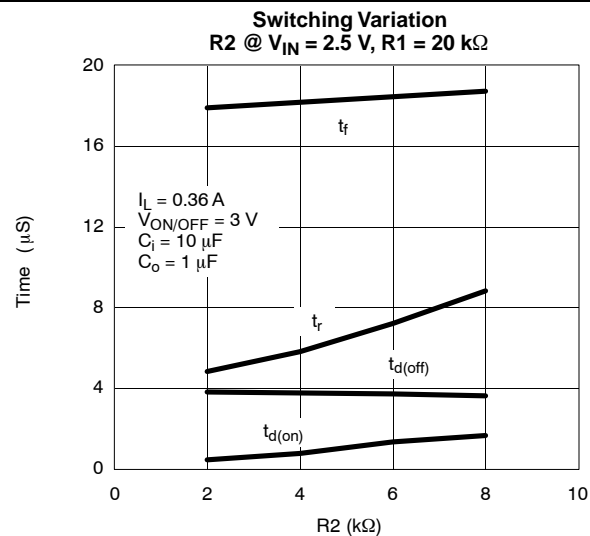
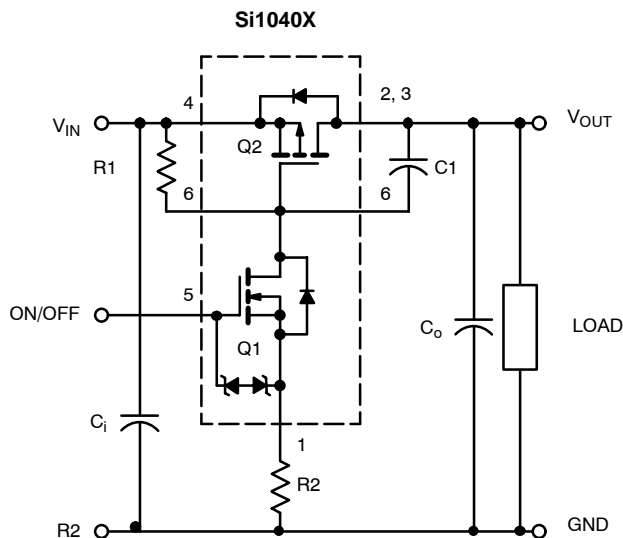
The Si1040X includes a p- and n-channel MOSFET in a single SC89-6 package. The low on-resistance p-channel TrenchFET is tailored for use as a load switch. The n-channel, with an external resistor, can be used as a level-shift to drive

FEATURES

- TrenchFET® Power MOSFET
- 1.8 to 8-V Input
- 1.5 to 8-V Logic Level Control
- Smallest LITTLE FOOT® Package: 1.6 mm x 1.6 mm
- 2000-V ESD Protection On Input Switch, $V_{ON/OFF}$
- Adjustable Slew-Rate

the p-channel load-switch. The n-channel MOSFET has internal ESD protection and can be driven by logic signals as low as 1.5-V. The Si1040X operates on supply lines from 1.8 to 8 V, and can drive loads up to 0.43 A.

APPLICATION CIRCUITS

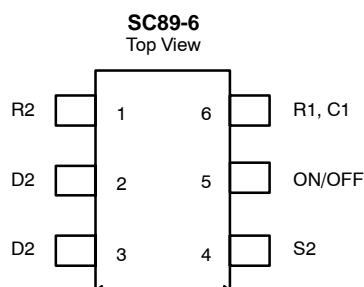


Note: For R2 switching variations with other $V_{IN}/R1$ combinations See Typical Characteristics

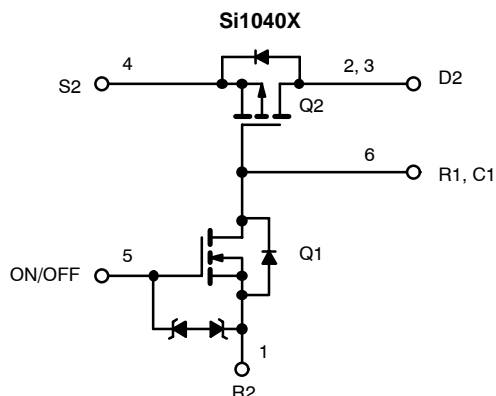
COMPONENTS		
R1	Pull-Up Resistor	Typical 10 k Ω to 1 m Ω *
R2	Optional Slew-Rate Control	Typical 0 to 100 k Ω *
C1	Optional Slew-Rate Control	Typical 1000 pF

*Minimum R1 value should be at least 10 x R2 to ensure Q1 turn-on.

The Si1040X is ideally suited for high-side load switching in portable applications. The integrated n-channel level-shift device saves space by reducing external components. The slew rate is set externally so that rise-times can be tailored to different load types.

FUNCTIONAL BLOCK DIAGRAM


Ordering Information: Si1040X-T1
Si1040X-T1—E3 (Lead (Pb)-Free)


ABSOLUTE MAXIMUM RATINGS (T_A = 25 °C UNLESS OTHERWISE NOTED)

Parameter	Symbol	Limit	Unit
Input Voltage	V _{IN}	8	V
ON/OFF Voltage	V _{ON/OFF}	8	
Load Current	I _L	Continuous ^{a, b}	A
		Pulsed ^{b, c}	
Continuous Intrinsic Diode Conduction ^a	I _S	-0.15	
Maximum Power Dissipation ^a	P _D	0.174	W
Operating Junction and Storage Temperature Range	T _J , T _{stg}	-55 to 150	°C
ESD Rating, MIL-STD-883D Human Body Model (100 pF, 1500 Ω)	ESD	2	kV

THERMAL RESISTANCE RATINGS

Parameter	Symbol	Typical	Maximum	Unit
Maximum Junction-to-Ambient (continuous current) ^a	R _{thJA}	600	720	°C/W
Maximum Junction-to-Foot (Q2)	R _{thJC}	450	540	

SPECIFICATIONS (T_J = 25 °C UNLESS OTHERWISE NOTED)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
OFF Characteristics						
Reverse Leakage Current	I _{FL}	V _{IN} = 8 V, V _{ON/OFF} = 0 V			1	μA
Diode Forward Voltage	V _{SD}	I _S = -0.15 A		0.85	1.2	V
ON Characteristics						
Input Voltage Range	V _{IN}		1.8		8	V
On-Resistance (p-channel) @ 1 A	r _{DS(on)}	V _{ON/OFF} = 1.5 V, V _{IN} = 4.5 V, I _D = 0.43 A		0.500	0.625	Ω
		V _{ON/OFF} = 1.5 V, V _{IN} = 2.5 V, I _D = 0.36 A		0.710	0.890	
		V _{ON/OFF} = 1.5 V, V _{IN} = 1.8 V, I _D = 0.3 A		1.0	1.25	
On-State (p-channel) Drain-Current	I _{D(on)}	V _{IN-OUT} ≤ 0.2 V, V _{IN} = 5 V, V _{ON/OFF} = 1.5 V	1			A
		V _{IN-OUT} ≤ 0.3 V, V _{IN} = 3 V, V _{ON/OFF} = 1.5 V	0.8			

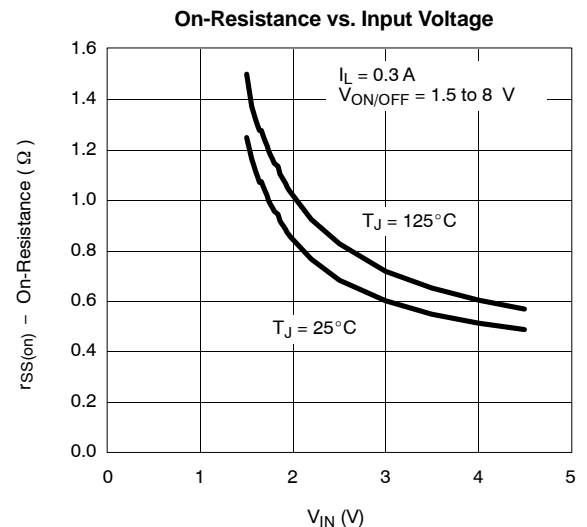
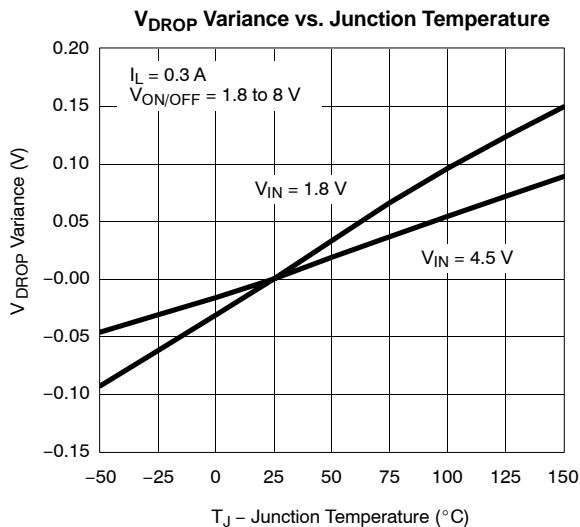
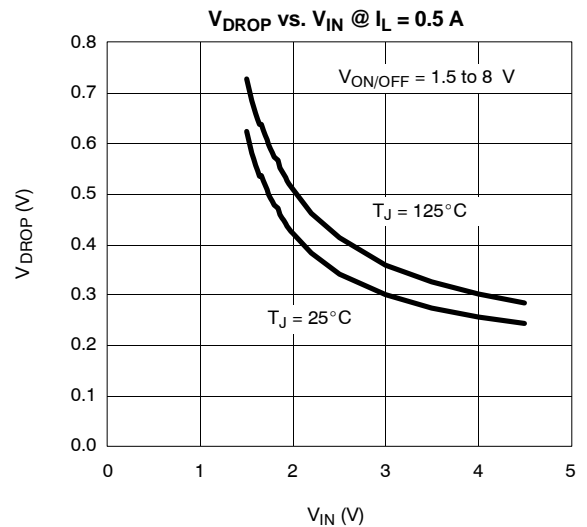
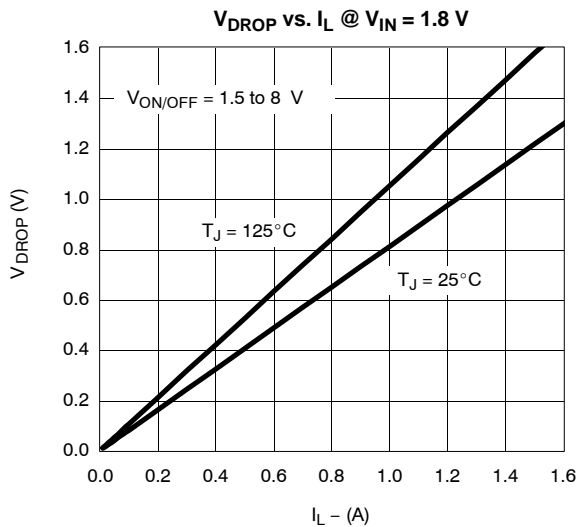
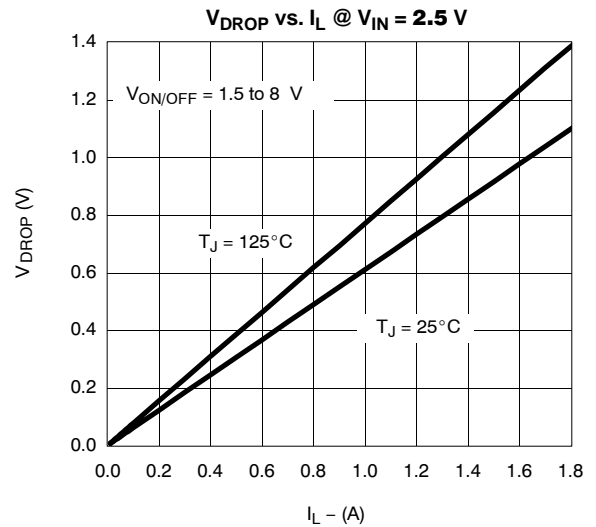
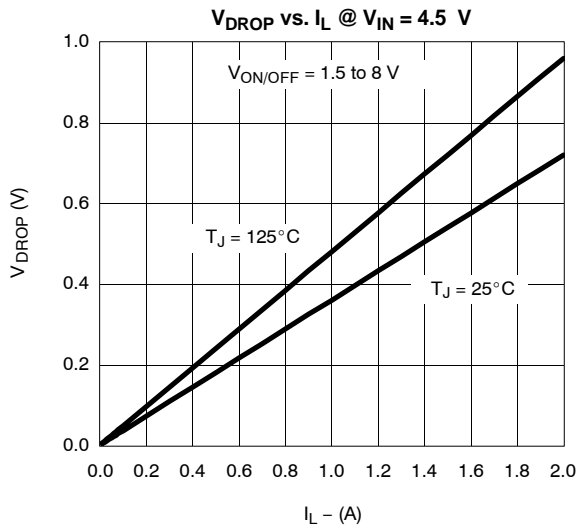
Notes

- a. Surface Mounted on FR4 Board.
b. V_{IN} = 8 V, V_{ON/OFF} = 8 V, T_A = 25 °C.
c. Pulse test: pulse width ≤ 300 μs, duty cycle ≤ 2%.

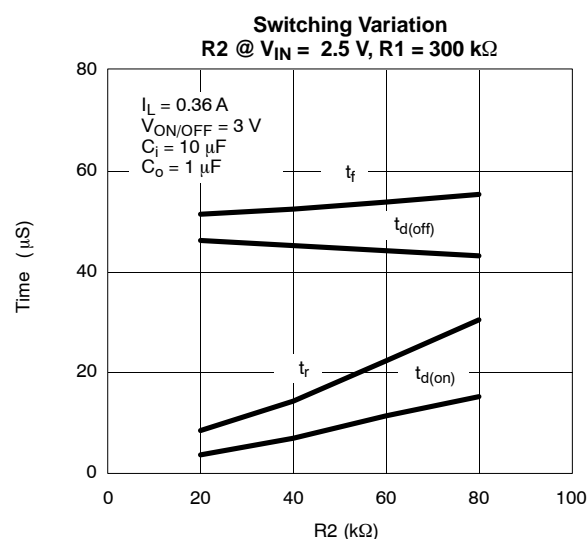
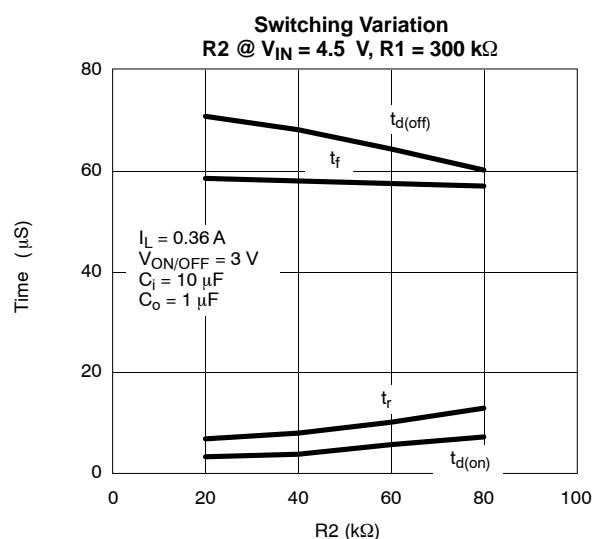
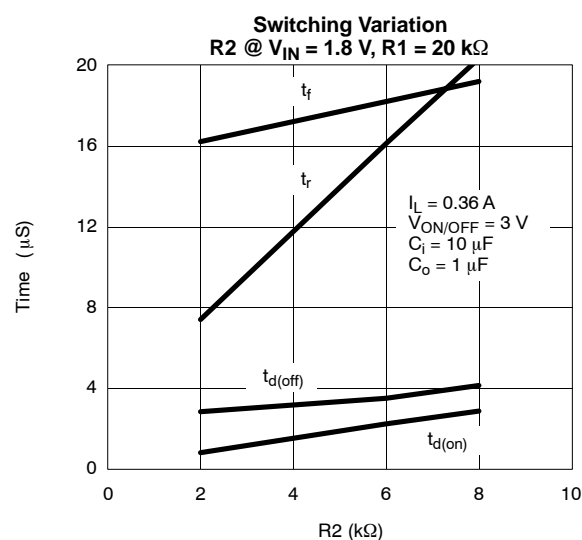
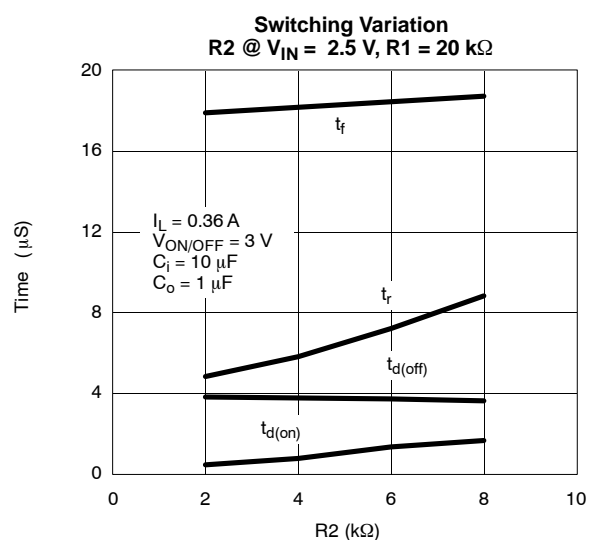
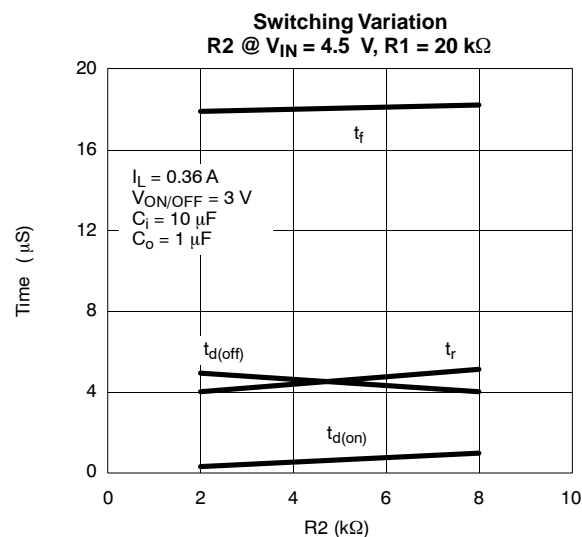
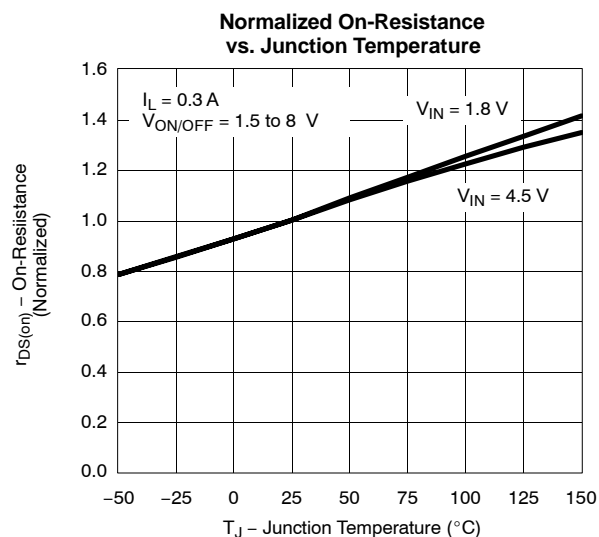
Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.



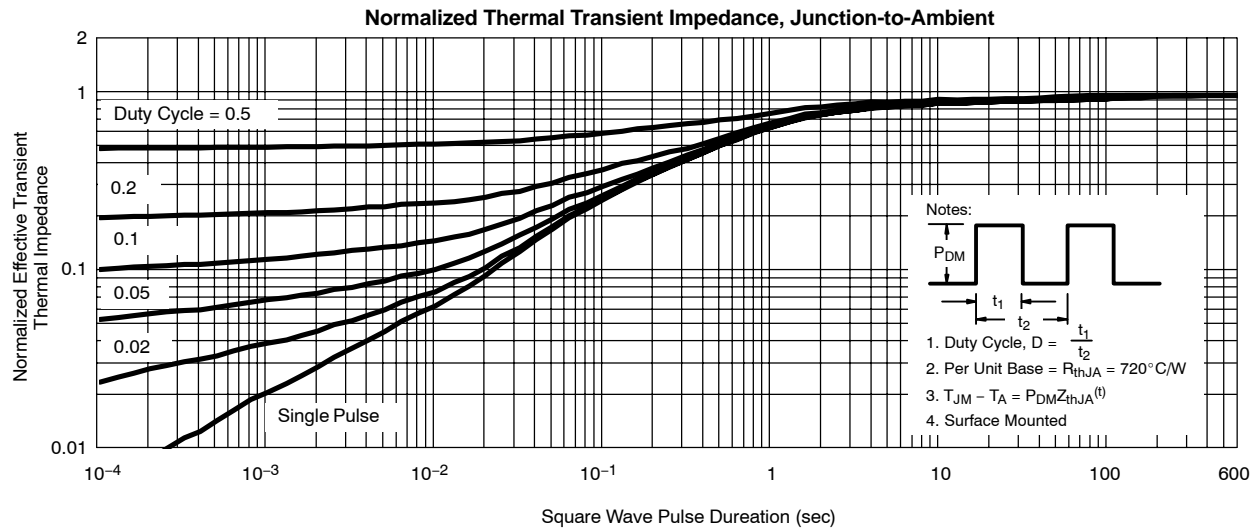
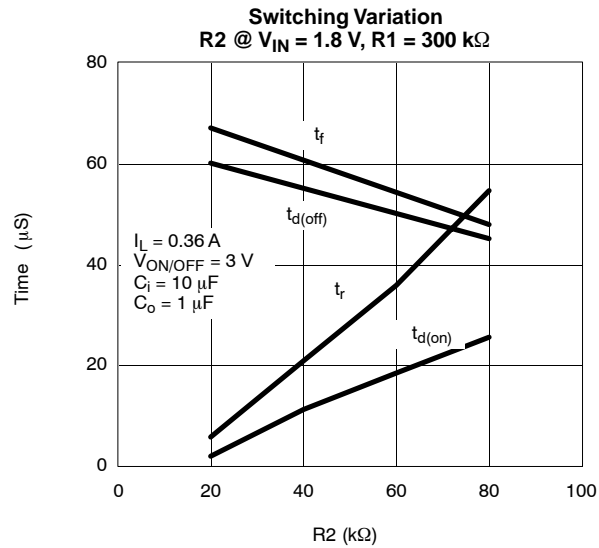
TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)



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