

Si4463DY

P-Channel 2.5V Specified PowerTrench® MOSFET

General Description

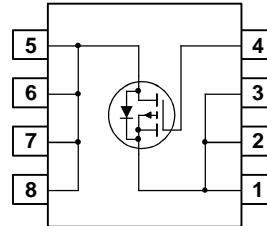
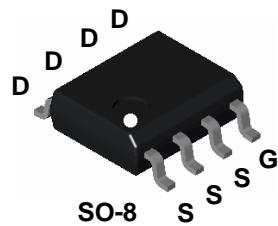
This P-Channel 2.5V specified MOSFET uses a rugged gate PowerTrench process. It has been optimized for power management applications with a wide range of gate drive voltage (2.5V – 12V).

Applications

- Power management
- Load switch
- Battery protection

Features

- $-11.5\text{ A}, -20\text{ V. } R_{DS(ON)} = 12\text{ m}\Omega @ V_{GS} = -4.5\text{ V}$
 $R_{DS(ON)} = 17.5\text{ m}\Omega @ V_{GS} = -2.5\text{ V}$
- Fast switching speed.
- High performance trench technology for extremely low $R_{DS(ON)}$
- High power and current handling capability



Absolute Maximum Ratings

$T_A=25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	Ratings	Units
V_{DSS}	Drain-Source Voltage	-20	V
V_{GSS}	Gate-Source Voltage	± 12	V
I_D	Drain Current – Continuous (Note 1a)	-11.5	A
	– Pulsed	-50	
P_D	Power Dissipation for Single Operation (Note 1a) (Note 1b) (Note 1c)	2.5	W
		1.2	
		1.0	
T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55 to +150	°C

Thermal Characteristics

$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient (Note 1a)	50	°C/W
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case (Note 1)	25	°C/W

Package Marking and Ordering Information

Device Marking	Device	Reel Size	Tape width	Quantity
4463	Si4463DY	13"	12mm	2500 units

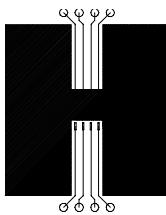
Electrical Characteristics

$T_A = 25^\circ\text{C}$ unless otherwise noted

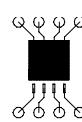
Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
Off Characteristics						
BV_{DSS}	Drain–Source Breakdown Voltage	$V_{GS} = 0 \text{ V}$, $I_D = -250 \mu\text{A}$	-20			V
ΔV_{DSS} ΔT_J	Breakdown Voltage Temperature Coefficient	$I_D = -250 \mu\text{A}$, Referenced to 25°C		-12		$\text{mV/}^\circ\text{C}$
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS} = -16 \text{ V}$, $V_{GS} = 0 \text{ V}$		-1		μA
I_{GSSF}	Gate–Body Leakage, Forward	$V_{GS} = 12 \text{ V}$, $V_{DS} = 0 \text{ V}$		100		nA
I_{GSSR}	Gate–Body Leakage, Reverse	$V_{GS} = -12 \text{ V}$, $V_{DS} = 0 \text{ V}$		-100		nA
On Characteristics (Note 2)						
$V_{GS(\text{th})}$	Gate Threshold Voltage	$V_{DS} = V_{GS}$, $I_D = -250 \mu\text{A}$	-0.6	-0.8	-1.5	V
$\Delta V_{GS(\text{th})}$ ΔT_J	Gate Threshold Voltage Temperature Coefficient	$I_D = -250 \mu\text{A}$, Referenced to 25°C		3		$\text{mV/}^\circ\text{C}$
$R_{DS(\text{on})}$	Static Drain–Source On–Resistance	$V_{GS} = -4.5 \text{ V}$, $I_D = -11.5 \text{ A}$ $V_{GS} = -2.5 \text{ V}$, $I_D = -9.5 \text{ A}$ $V_{GS} = -4.5 \text{ V}$, $I_D = -11.5 \text{ A}$, $T_J = 125^\circ\text{C}$		10 14 13	12 17.5 18	$\text{m}\Omega$
$I_{D(\text{on})}$	On–State Drain Current	$V_{GS} = -4.5 \text{ V}$, $V_{DS} = -5 \text{ V}$	-50			A
g_{FS}	Forward Transconductance	$V_{DS} = -10 \text{ V}$, $I_D = -10 \text{ A}$		49		S
Dynamic Characteristics						
C_{iss}	Input Capacitance	$V_{DS} = -10 \text{ V}$, $V_{GS} = 0 \text{ V}$, $f = 1.0 \text{ MHz}$		4481		pF
C_{oss}	Output Capacitance			1532		pF
C_{rss}	Reverse Transfer Capacitance			540		pF
Switching Characteristics (Note 2)						
$t_{d(\text{on})}$	Turn–On Delay Time	$V_{DD} = -5 \text{ V}$, $I_D = -1 \text{ A}$, $V_{GS} = -4.5 \text{ V}$, $R_{\text{GEN}} = 6 \Omega$		15	30	ns
t_r	Turn–On Rise Time			15	30	ns
$t_{d(\text{off})}$	Turn–Off Delay Time			120	240	ns
t_f	Turn–Off Fall Time			60	120	ns
Q_g	Total Gate Charge	$V_{DS} = -10 \text{ V}$, $I_D = -11.5 \text{ A}$, $V_{GS} = -4.5 \text{ V}$		41	60	nC
Q_{gs}	Gate–Source Charge			6.4		nC
Q_{gd}	Gate–Drain Charge			11.8		nC
Drain–Source Diode Characteristics and Maximum Ratings						
I_s	Maximum Continuous Drain–Source Diode Forward Current			-2.1		A
V_{SD}	Drain–Source Diode Forward Voltage	$V_{GS} = 0 \text{ V}$, $I_s = -1.5 \text{ A}$ (Note 2)		-0.65	-1.2	V

Notes:

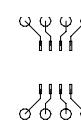
- R_{thJA} is the sum of the junction-to-case and case-to-ambient thermal resistance where the case thermal reference is defined as the solder mounting surface of the drain pins. R_{thJC} is guaranteed by design while R_{thCA} is determined by the user's board design.



a) 50°/W when mounted on a 1 in² pad of 2 oz copper



b) 105°/W when mounted on a .04 in² pad of 2 oz copper



c) 125°/W when mounted on a minimum pad.

Scale 1 : 1 on letter size paper

2. Pulse Test: Pulse Width < 300μs, Duty Cycle < 2.0%

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DOME TM	ISOPLANAR TM	Quiet Series TM	
E ² CMOS TM	MICROWIRE TM	SILENT SWITCHER [®]	
EnSigna TM	OPTOLOGIC TM	SMART START TM	
FACT TM	OPTOPLANAR TM	SuperSOT TM -3	
FACT Quiet Series TM	PACMAN TM	SuperSOT TM -6	
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