

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).

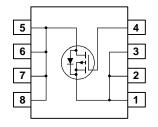
Applications

- · Power management
- Load switch
- · Battery protection

Features

- -11.5 A, -20 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 $R_{\mbox{\scriptsize DS(ON)}}$
- · High power and current handling capability





Absolute Maximum Ratings T_A=25°C unless otherwise noted

Symbol	Parameter		Ratings Ui		
V _{DSS}	Drain-Source Voltage		-20	V	
V_{GSS}	Gate-Source Voltage		± 12	V	
I _D	Drain Current - Continuous	(Note 1a)	-11.5	А	
	- Pulsed		-50		
P _D	Power Dissipation for Single Operation	(Note 1a)	2.5	W	
		(Note 1b)	1.2		
		(Note 1c)	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

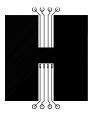
Package Marking and Ordering Information

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

Symbol	Parameter	Test Conditions	Min	Тур	Max	Units
Off Char	acteristics			ı	I.	ı
BV _{DSS}	Drain-Source Breakdown Voltage	$V_{GS} = 0 \text{ V}, I_{D} = -250 \mu\text{A}$	-20			V
ΔBV _{DSS} ΔT _J	Breakdown Voltage Temperature Coefficient	$I_D = -250 \mu\text{A}$, Referenced to 25°C		-12		mV/°C
I _{DSS}	Zero Gate Voltage Drain Current	$V_{DS} = -16 \text{ V}, V_{GS} = 0 \text{ V}$			-1	μΑ
I _{GSSF}	Gate-Body Leakage, Forward	$V_{GS} = 12 \text{ V}, \qquad V_{DS} = 0 \text{ V}$			100	nA
I _{GSSR}	Gate-Body Leakage, Reverse	$V_{GS} = -12 \text{ V}, V_{DS} = 0 \text{ V}$			-100	nA
On Char	acteristics (Note 2)					
V _{GS(th)}	Gate Threshold Voltage	$V_{DS} = V_{GS}, I_{D} = -250 \mu A$	-0.6	-0.8	-1.5	V
$\frac{\Delta V_{GS(th)}}{\Delta T_J}$	Gate Threshold Voltage Temperature Coefficient	$I_D = -250 \mu\text{A}$, Referenced to 25°C		3		mV/°C
R _{DS(on)}	Static Drain–Source On–Resistance	$\begin{split} V_{GS} = -4.5 \ V, & I_D = -11.5 \ A \\ V_{GS} = -2.5 \ V, & I_D = -9.5 \ A \\ V_{GS} = -4.5 \ V, I_D = -11.5 A, T_J = 125 ^{\circ}C \end{split}$		10 14 13	12 17.5 18	mΩ
I _{D(on)}	On-State Drain Current	$V_{GS} = -4.5 \text{ V}, \qquad V_{DS} = -5 \text{ V}$	-50			Α
g _{FS}	Forward Transconductance	$V_{DS} = -10 \text{ V}, \qquad I_{D} = -10 \text{ A}$		49		S
Dvnamio	Characteristics			•	•	
C _{iss}	Input Capacitance	$V_{DS} = -10 \text{ V}, V_{GS} = 0 \text{ V},$		4481		pF
Coss	Output Capacitance	f = 1.0 MHz		1532		pF
C _{rss}	Reverse Transfer Capacitance			540		pF
Switchin	ng Characteristics (Note 2)			•	•	
t _{d(on)}	Turn-On Delay Time	$V_{DD} = -5 \text{ V}, \qquad I_D = -1 \text{ A},$		15	30	ns
t _r	Turn-On Rise Time	$V_{GS} = -4.5 \text{ V}, \qquad R_{GEN} = 6 \Omega$		15	30	ns
t _{d(off)}	Turn-Off Delay Time			120	240	ns
t _f	Turn-Off Fall Time			60	120	ns
Qg	Total Gate Charge	$V_{DS} = -10 \text{ V}, \qquad I_{D} = -11.5 \text{ A},$		41	60	nC
Q _{gs}	Gate-Source Charge	$V_{GS} = -4.5 \text{ V}$		6.4		nC
$\overline{Q_{gd}}$	Gate-Drain Charge			11.8		nC
Drain-S	ource Diode Characteristics	and Maximum Ratings		•		•
Is	Maximum Continuous Drain-Sourc				-2.1	Α
V _{SD}	Drain–Source Diode Forward Voltage	$V_{GS} = 0 \text{ V}, I_S = -1.5 \text{ A} \text{(Note 2)}$		-0.65	-1.2	V

Notes:

^{1.} $R_{\theta JA}$ 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 $R_{\theta CA}$ is determined by the user's board design.



a) 50°/W when mounted on a 1in² 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 < 300μ s, Duty Cycle < 2.0%

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