



Si4431BDY vs. Si4431DY

Description: P-Channel, 30 V (D-S) MOSFET

Package: SOIC-8

Pin Out: Identical

Part Number Replacements:

Si4431BDY Replaces Si4431DY

Si4431BDY-E3 (Lead (Pb)-free version) Replaces Si4431DY

Si4431BDY-T1 Replaces Si4431DY-T1

Si4431BDY-T1-E3 (Lead (Pb)-free version) Replaces Si4431DY-T1

ABSOLUTE MAXIMUM RATINGS $T_A = 25\text{ }^\circ\text{C}$, unless otherwise noted				
Parameter	Symbol	Si4431BDY	Si4431DY	Unit
Drain-Source Voltage	V_{DS}	- 30	- 30	V
Gate-Source Voltage	V_{GS}	± 20	± 20	
Continuous Drain Current	$T_A = 25\text{ }^\circ\text{C}$	- 7.5	- 5.8	A
	$T_A = 70\text{ }^\circ\text{C}$	- 6.0	- 4.6	
Pulsed Drain Current	I_{DM}	- 30	- 30	
Continuous Source Current (MOSFET Diode Conduction)	I_S	- 2.1	- 2.3	
Power Dissipation	$T_A = 25\text{ }^\circ\text{C}$	2.5	2.5	W
	$T_A = 70\text{ }^\circ\text{C}$	1.6	1.6	
Operating Junction and Storage Temperature Range	T_j and T_{stg}	- 55 to 150	- 55 to 150	$^\circ\text{C}$
Maximum Junction-to-Ambient	R_{thJA}	50	50	$^\circ\text{C/W}$

SPECIFICATIONS $T_J = 25\text{ }^\circ\text{C}$, unless otherwise noted								
Parameter	Symbol	Si4431BDY			Si4431DY			Unit
		Min	Typ	Max	Min	Typ	Max	
Static								
Gate-Threshold Voltage	$V_{G(th)}$	- 1.0		- 3.0	- 1.0			V
Gate-Body Leakage	I_{GSS}			± 100			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}			- 1			- 1	μA
On-State Drain Current	$V_{GS} = - 10\text{ V}$	$I_{D(on)}$	- 30		- 30			A
	$V_{GS} = - 4.5\text{ V}$		- 7		- 7			
Drain-Source On-Resistance	$V_{GS} = - 10\text{ V}$	$r_{DS(on)}$	0.023	0.030	0.029	0.040		Ω
	$V_{GS} = - 4.5\text{ V}$		0.036	0.050	0.047	0.070		
Forward Transconductance	g_{fs}		18		9.3			S
Diode Forward Voltage	V_{SD}		- 0.78	- 1.1	- 0.78	- 1.2		V
Dynamic								
Total Gate Charge	Q_g		13	20		22	35	nC
Gate-Source Charge	Q_{gs}		3.6			3.95		
Gate-Drain Charge	Q_{gd}		6			3.5		
Switching								
Turn-On Time	$t_{d(on)}$		10	20		11.5	20	ns
	t_r		10	20		12	20	
Turn-Off Time	$t_{d(off)}$		70	110		38	55	
	t_f		47	70		15	25	
Source-Drain Reverse Recovery Time	t_{rr}		45	80		50	80	

Specification comparisons are supplied as a courtesy to compare two devices and do not constitute a commercial product datasheet or any guarantee of identical performance. Designers should refer to the appropriate datasheets of the same number for guaranteed specification limits.