N-Channel Reduced Q_g, Fast Switching MOSFET

PRODUCT SUMMARY

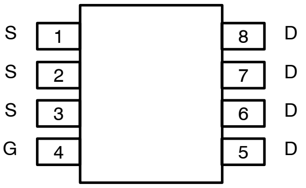
V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A)
30	0.007 @ V_{GS} = 10 V	16
	0.010 @ V_{GS} = 4.5 V	13

FEATURES

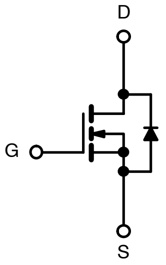
- TrenchFET® Power MOSFET
- High-Efficiency PWM Optimized
- 100% R_g Tested

Pb-free
Available

SO-8



Top View



N-Channel MOSFET

Ordering Information: Si4888DY
Si4888DY-T1 (with Tape and Reel)
Si4888DY—E3 (Lead (Pb)-Free)
Si4888DY-T1—E3 (Lead (Pb)-Free) with Tape and Reel)

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

Parameter		Symbol	10 secs	Steady State	Unit
Drain-Source Voltage		V_{DS}	30		V
Gate-Source Voltage		V_{GS}	±20		
Continuous Drain Current (T_J = 150°C)[a]	T_A = 25°C	I_D	16	11	A
	T_A = 70°C		13	8	
Pulsed Drain Current		I_{DM}	±50		
Continuous Source Current (Diode Conduction)[a]		I_S	3.0	1.40	
Maximum Power Dissipation[a]	T_A = 25°C	P_D	3.5	1.6	W
	T_A = 70°C		2.2	1.0	
Operating Junction and Storage Temperature Range		T_J, T_{stg}	−55 to 150		°C

THERMAL RESISTANCE RATINGS

Parameter		Symbol	Typical	Maximum	Unit
Maximum Junction-to-Ambient (MOSFET)[a]	$t \le 10$ sec	R_{thJA}	29	35	°C/W
	Steady State		65	80	
Maximum Junction-to-Foot (Drain)	Steady State	R_{thJF}	15	18	

Notes
a. Surface Mounted on 1" x 1" FR4 Board.

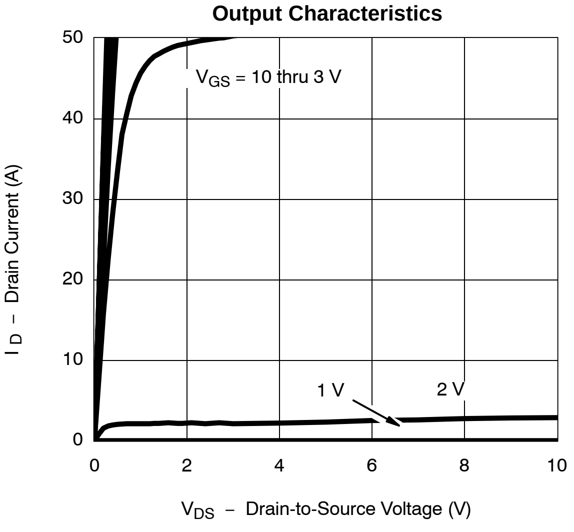
MOSFET SPECIFICATIONS (T_J = 25°C UNLESS OTHERWISE NOTED)

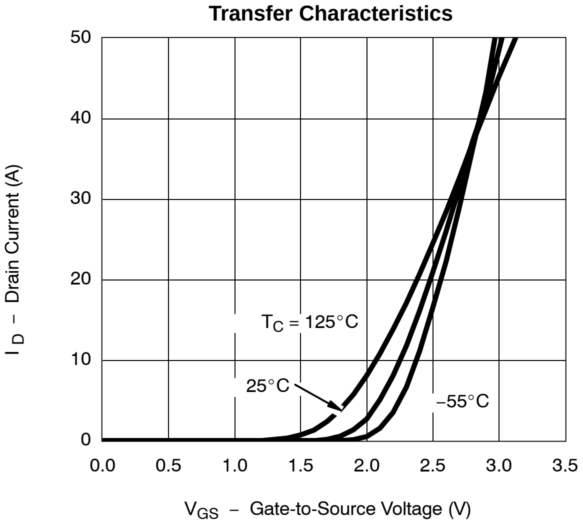
Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Static						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = 250\ \mu A$	0.80		1.6	V
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0\ V$, $V_{GS} = \pm 20\ V$			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 30\ V$, $V_{GS} = 0\ V$			1	µA
		$V_{DS} = 30\ V$, $V_{GS} = 0\ V$, $T_J = 70°C$			5	
On-State Drain Current[a]	$I_{D(on)}$	$V_{DS} \geq 5\ V$, $V_{GS} = 10\ V$	40			A
Drain-Source On-State Resistance[a]	$r_{DS(on)}$	$V_{GS} = 10\ V$, $I_D = 16\ A$		0.0058	0.007	Ω
		$V_{GS} = 4.5\ V$, $I_D = 13\ A$		0.008	0.010	
Forward Transconductance[a]	g_{fs}	$V_{DS} = 15\ V$, $I_D = 16\ A$		38		S
Diode Forward Voltage[a]	V_{SD}	$I_S = 3\ A$, $V_{GS} = 0\ V$		0.74	1.1	V
Dynamic[b]						
Total Gate Charge	Q_g	$V_{DS} = 15\ V$, $V_{GS} = 5.0\ V$, $I_D = 16\ A$		16.3	24	nC
Gate-Source Charge	Q_{gs}			4		
Gate-Drain Charge	Q_{gd}			5.9		
Gate Resistance	R_G		0.5	1.5	2.6	Ω
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = 15\ V$, $R_L = 15\ \Omega$ $I_D \cong 1\ A$, $V_{GEN} = 10\ V$, $R_G = 6\ \Omega$		14	20	ns
Rise Time	t_r			10	15	
Turn-Off Delay Time	$t_{d(off)}$			44	70	
Fall Time	t_f			20	30	
Source-Drain Reverse Recovery Time	t_{rr}	$I_F = 3\ A$, di/dt = 100 A/µs		40	70	

Notes
a. Pulse test; pulse width ≤ 300 µs, duty cycle ≤ 2%.
b. Guaranteed by design, not subject to production testing.

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)


Output Characteristics


Transfer Characteristics