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SI7414DN-TP
N-Channel MOSFET

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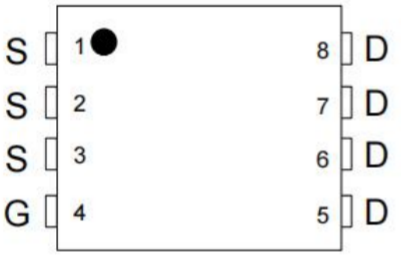
Product Summary

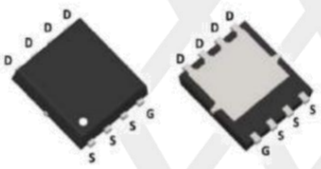
- V_{DS} 60 V
- I_{DS} (at V_{GS}=10V) 30A
- $R_{DS\ (ON)}$ (at V_{GS}=10V) ≤12mΩ (TYP)

Application

- Load switch
- High Frequency Switching and Synchronous Rectification
- Battery protection
- Uninterruptible power supply

Package and Pin Configuration





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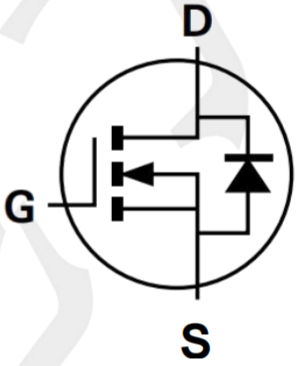
Circuit diagram



Absolute Maximum Ratings (T_A=25℃unless otherwise noted)

PARAMETER		SYMBOL	LIMIT	UNIT
Drain-Source Voltage		V_{DS}	60	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current	T_C=25℃	I_D	30	A
	T_C=100℃		15	
Pulsed Drain Current		I_{DM}	96	A
Single Pulse Avalanche Energy		EAS	26	mJ
Total Power Dissipation	T_C=25℃	P_{DTOT}	30	W
Operating Junction Temperature Range		T_J	-55 to +150	℃
Storage Temperature Range		T_{stg}	-55 to +150	℃

Thermal Characteristic

PARAMETER		Symbol	Value	Unit
Junction-to-Ambient Thermal Resistance	PCB Mount (Note)	$R_{\theta JA}$	62	°C/W
Thermal Resistance Junction-Case		$R_{\theta JC}$	2.5	°C/W

Note : The data tested by surface mounted on a 1 inch2 FR-4 board with 2OZ copper.

Electrical Characteristics (T_A=25℃unless otherwise noted)

PARAMETER	CONDITIONS	SYMBOL	MIN	TYP	MAX	UNIT
Static						
Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=250uA	BV_{DSS}	60	--	--	V
Gate-Source Threshold Voltage	V_{DS}=V_{GS}, I_D= 250μA	$V_{GS(th)}$	1.0	1.6	2.5	V
Gate-Source Leakage	V_{DS}=0V, V_{GS}= ±20V	I_{GSS}	--	--	±100	nA
Zero Gate Voltage Drain Current	V_{DS}= 60V, V_{GS}=0V	I_{DSS}	--	0.1	1.0	μA
	V_{DS}=60V, T_J=55°C		--	1.0	5.0	μA
Drain-Source On-State Resistance (Note 1)	V_{GS}= 10V, I_D= 20A	R_{DS}(on)	--	12	18	mΩ
	V_{GS}= 4.5V, I_D= 10A		--	17	22	
Dynamic (Note 2)						
Total Gate Charge (Note 3)	V_{DS} = 30V, I_D = 20A, V_{GS} = 10V	Q_g	--	22	--	nC
Gate-Source Charge (Note 3)		Q_{gs}	--	4.6	--	
Gate-Drain Charge (Note 3)		Q_{gd}	--	3.6	--	
Input Capacitance	V_{DS} = 25V, V_{GS} = 0V, F= 1.0MHz	C_{iss}	--	930	--	pF
Output Capacitance		C_{oss}	--	230	--	
Reverse Transfer Capacitance		C_{rss}	--	10	--	
Switching						
Turn-On Delay Time (Note 3)	V_{DD} =30V, I_D=20A, V_{GS} = 10V, R_G = 1.6Ω	$t_{d(on)}$	--	4.8	--	nS
Rise Time (Note 3)		t_r	--	2.6	--	
Turn-Off Delay Time (Note 3)		$t_{d(off)}$	--	14	--	
Fall Time (Note 3)		t_f	--	2.8	--	
Source-Drain Diode Ratings and Characteristics (Note 2)						
Forward Voltage	V_{GS} = 0V, I_F = 1A	V_{SD}	--	0.7	1.1	V
Continuous Source Current	Integral reverse diode in the MOSFET	I_S	--	--	30	A
Pulsed Current (Note 1)		I_{SM}	--	--	96	A

Notes:

1. Pulse test; pulse width ≤ 300 μS, duty cycle ≤ 2%.
2. Guaranteed by design, not subject to production testing.
3. Independent of operating temperature

Typical Performance Characteristics

Figure1: Output Characteristics

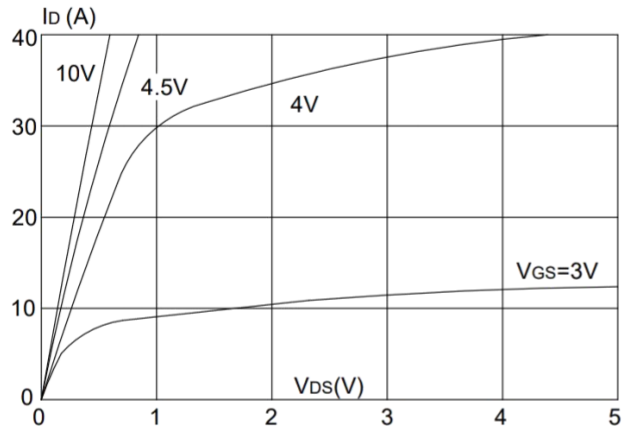


Figure 2: Typical Transfer Characteristics

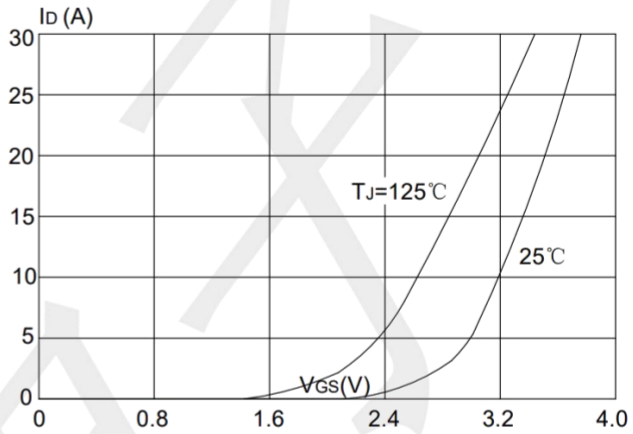


Figure 3: On-resistance vs. Drain Current

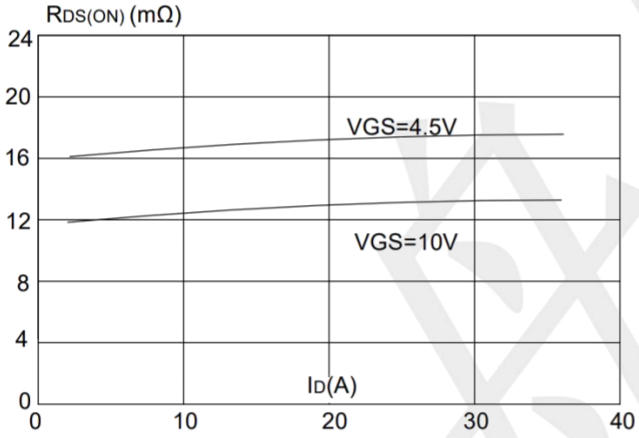


Figure 4: Body Diode Characteristics

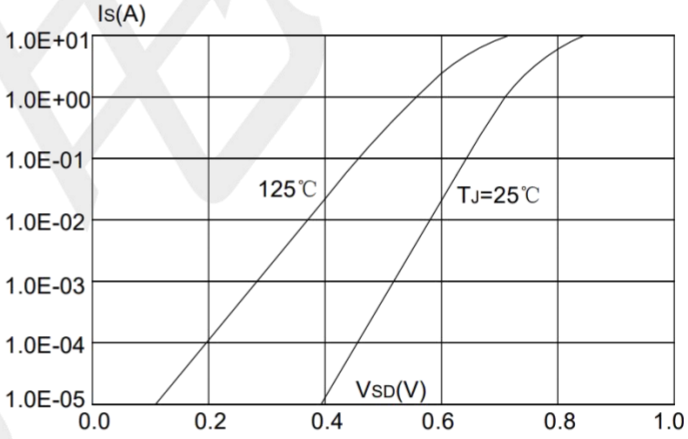


Figure 5: Gate Charge Characteristics

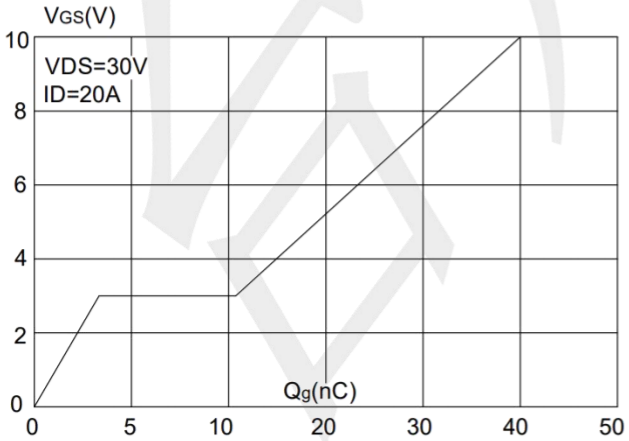
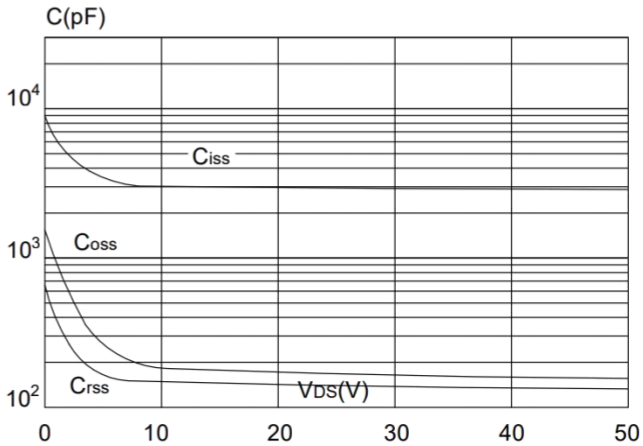


Figure 6: Capacitance Characteristics



Package Information

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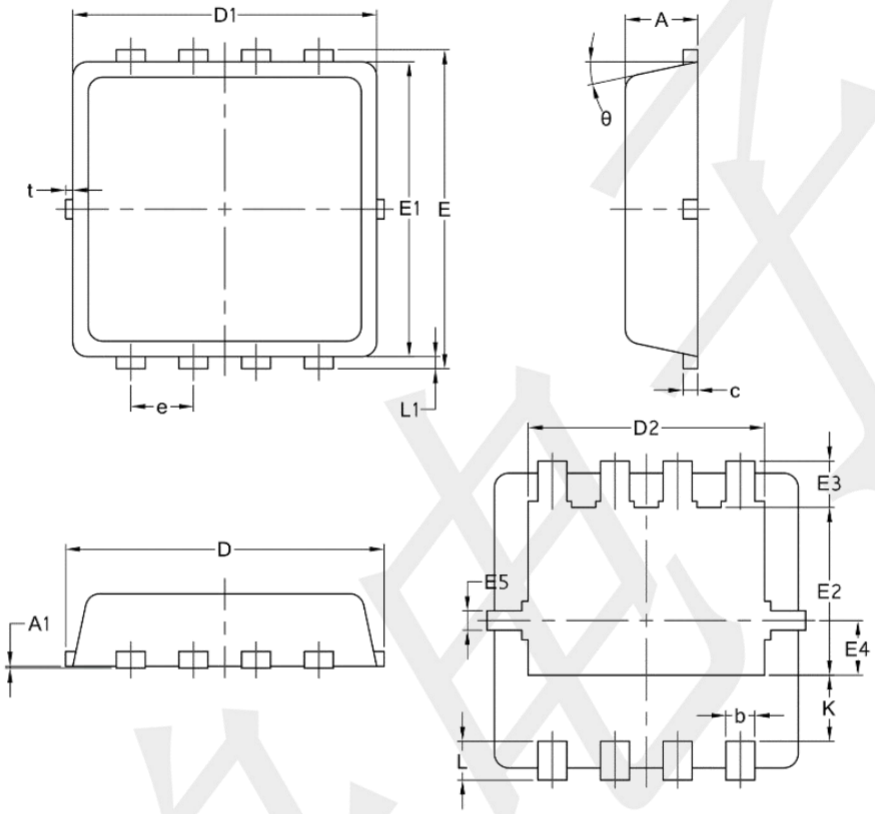

Symbol	Common		
	mm		
	Mim	Nom	Max
A	0.70	0.75	0.85
A1	/	/	0.05
b	0.20	0.30	0.40
c	0.10	0.152	0.25
D	3.15	3.30	3.45
D1	3.00	3.15	3.25
D2	2.29	2.45	2.65
E	3.15	3.30	3.45
E1	2.90	3.05	3.20
E2	1.54	1.74	1.94
E3	0.28	0.48	0.65
E4	0.37	0.57	0.77
E5	0.10	0.20	0.30
e	0.60	0.65	0.70
K	0.59	0.69	0.89
L	0.30	0.40	0.50
L1	0.06	0.125	0.20
t	0	0.075	0.13
Φ	10	12	14