

TN60N30DN

N-Channel Enhancement Mode Power MOSFET

PDFN5x6-8L

Product Summary

- $V_{DS} = 30V, I_D = 60A$
- $R_{DS(on)} < 8.5m\Omega @ V_{GS} = 10V$
- $R_{DS(on)} < 14.5m\Omega @ V_{GS} = 4.5V$

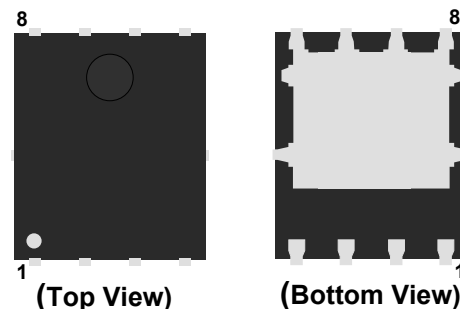
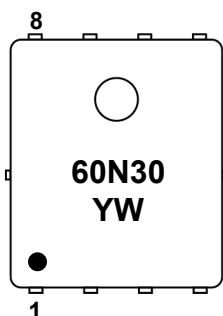
Features

- Advanced Trench Technology
- RoHS and Reach Compliant
- Halogen and Antimony Free
- Moisture Sensitivity Level 3

Application

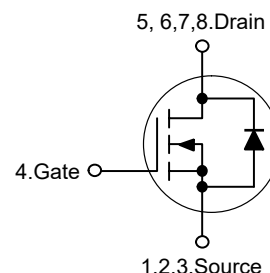
- BLDC
- Wireless impact
- Mobile phone fast charging

Marking Code



Pin	Description
1,2,3	Source
4	Gate
5,6,7,8	Drain

Schematic Diagram



Absolute Maximum Ratings

Ratings at 25°C case temperature unless otherwise specified.

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	± 20	V
Drain Current-Continuous	I_D	60	A
Drain Current-Pulsed ^{Note1}	I_{DM}	160	A
Maximum Power Dissipation	P_D	24	W
Single Pulse Avalanche Energy ^{Note2}	E_{AS}	42	mJ
Junction Temperature	T_J	150	°C
Storage Temperature Range	T_{STG}	-55 to +150	°C

Thermal Characteristics

Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	1.72	°C/W
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Electrical Characteristics(T_J=25°C unless otherwise specified)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	V _{(BR)DSS}	V _{GS} =0V, I _D =250μA	30	--	--	V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =30V, V _{GS} =0V	--	--	1	μA
Gate-Body Leakage Current	I _{GSS}	V _{GS} =±20V, V _{DS} =0V	--	--	±100	nA
Gate Threshold Voltage ^{Note3}	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	1	1.6	2.5	V
Drain-Source On-Resistance ^{Note3}	R _{DS(on)}	V _{GS} =10V, I _D =25A	--	--	8.5	mΩ
		V _{GS} =4.5V, I _D =15A	--	--	14.5	mΩ
Dynamic Characteristics						
Input Capacitance	C _{iss}	V _{DS} =15V, V _{GS} =0V, f=1MHz	--	1310	--	pF
Output Capacitance	C _{oss}		--	142	--	pF
Reverse Transfer Capacitance	C _{rss}		--	121	--	pF
Total Gate Charge	Q _g	V _{DS} =15V, I _D =20A, V _{GS} =0~10V	--	23	--	nC
Gate-Source Charge	Q _{gs}		--	4.5	--	nC
Gate-Drain Charge	Q _{gd}		--	5.5	--	nC
Switching Characteristics						
Turn-on Delay Time	t _{d(on)}	V _{DD} =15V, I _D =15A, V _{GS} =10V, R _{GEN} =3Ω	--	7	--	nS
Turn-on Rise Time	t _r		--	15	--	nS
Turn-off Delay Time	t _{d(off)}		--	25	--	nS
Turn-off Fall Time	t _f		--	6	--	nS
Source-Drain Diode Characteristics						
Diode Forward Voltage ^{Note2}	V _{SD}	V _{GS} =0V, I _S =20A	--	--	1.2	V
Diode Forward Current ^{Note1,4}	I _S		--	--	60	A

Note :

1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
2. EAS Condition: T_J=25°C, V_{DD}=15V, V_G=10V, L=0.5mH, R_G=25Ω, I_{AS}=13A.
3. The data tested by pulsed, pulse width ≤ 300us, duty cycle ≤ 2%

Test Circuit

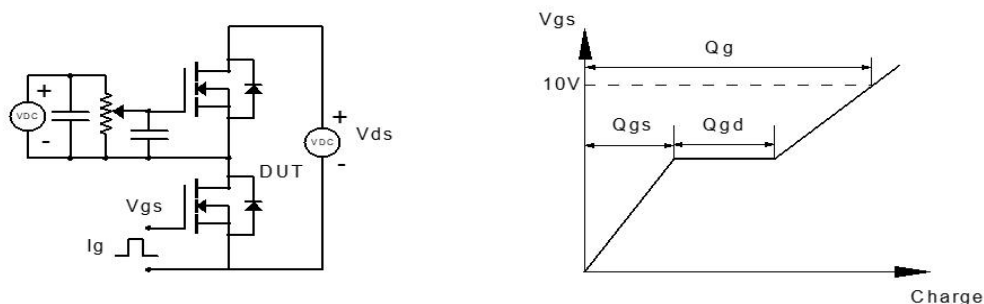


Figure 1: Gate Charge Test Circuit & Waveform

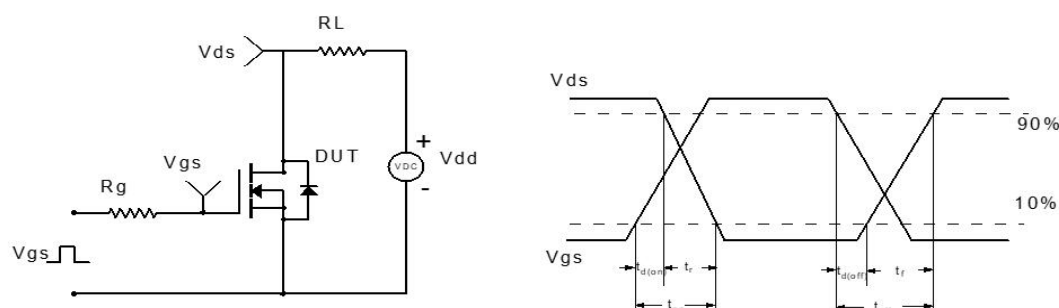


Figure 2: Resistive Switching Test Circuit & Waveform

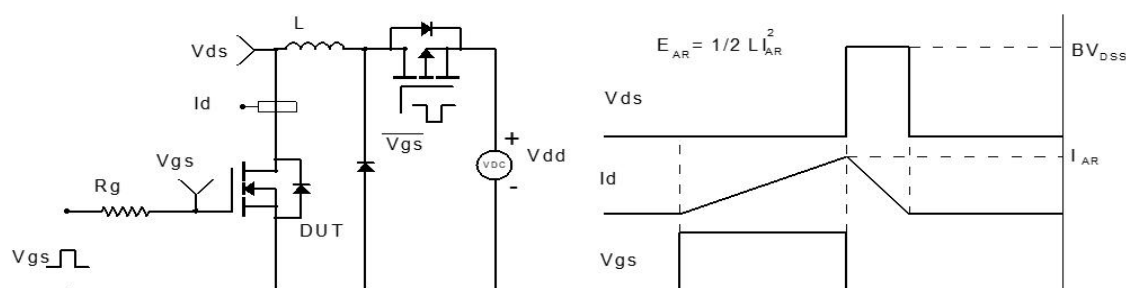


Figure 3: Unclamped Inductive Switching Test Circuit & Waveform

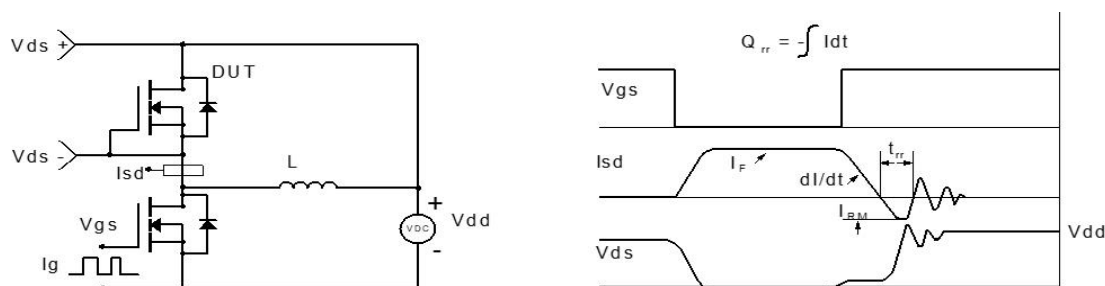


Figure 4: Diode Recovery Test Circuit & Waveform

