DATASHEET
N-Channel Enhancement Mode Power MOSFET

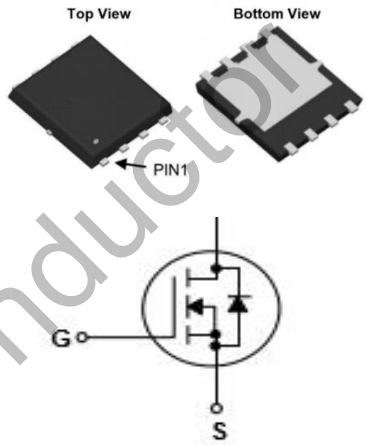
Description

This Power MOSFET is produced using advanced SGT technology. This advanced technology has been especially tailored to minimize conduction loss, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode.

Features

- V_{DS}=45V , I_D=180A
- $R_{DS(ON)TYP}$ = 1.5mΩ @V_{GS}=10V
- Very Low On-resistance RDS(ON)
- LowCrss
- Fast switching
- 100% avalanche tested
- Improved dv/dt capability

PDFN5*6-8L



Schematic

Applications

- PWM Application
- Load Switch
- Power Management

100% UIS TESTED!

100% ΔVds TESTED!

RoHS

Package Marking and Ordering Information

Device Marking	Package	Packing	Reel size	Reel (pcs)	Per Carton (pcs)
180N045	PDFN5*6	Reel	13inch	5000	60000

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Absolute Maximum Ratings

Parameter		Symbol	Value	Unit
Drain-source Voltage		V_{DS}	45	V
Gate-source Voltage		V_{GS}	±20	V
Continuous Drain Current	T_C=25℃	I_D	180	A
	T_C=100℃		127	
Pulsed Drain Current(T_C=25℃,T_p Limited By T_{jmax}) (note1)		I_{DM}	680	A
Maximum Power Dissipation(T_C=25℃)		P_D	134	W
Avalanche energy , single Pulse(L=1mH) (note2)		E_{AS}	1300	mJ
Peak Diode Recovery dv/dt (note3)		dv/dt	4.5	V/ns
Thermal Resistance Junction to Case		$R_{\theta JC}$	0.95	℃/W
Operating Junction And Storage Temperature		T_j,T_{stg}	-55 To 150	℃
Maximum lead temperature for soldering purposes, 1/8" from case for 5 seconds		T_L	300	℃

* Drain current limited by maximum junction temperature.

Notes:

1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
2. EAS condition: TJ =25℃, VDD =15V, VG =10V, RG =25Ω, L=1mH,
3. Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%

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Electrical Characteristic (TC=25

Parameter	Symbol	Value			Unit	Test Condition
		Min.	Typ.	Max.		
Off Characteristic						
Drain-source breakdown voltage	BV_{DSS}	45	-	-	V	V_{GS}=0V, I_D=250μA
Zero gate voltage drain current	I_{DSS}	-	-	1	μA	V_{DS}=45V, V_{GS}=0V
		-	-	100	μA	V_{DS}=36V, TC =125℃
Gate-source leakage current	I_{GSS}	-	-	±100	nA	V_{GS}=±20V, V_{DS}=0V
On Characteristics						
Gate threshold voltage	$V_{GS(th)}$	2.0	-	4.0	V	V_{DS}=V_{GS}, I_D=250μA
Drain-source on-state resistance	$R_{DS(on)}$	-	1.5	1.75	mΩ	V_{GS}=10V, I_D=80A
Dynamic Characteristic						
Input Capacitance	C_{iss}	-	5468	-	PF	V_{GS}=0V, V_{DS}=30V, f=1.0MHz
Output Capacitance	C_{oss}	-	1470	-		
Reverse Transfer Capacitance	C_{rss}	-	128	-		
Switching Characteristics						
Turn-on delay time	$t_{d(on)}$	-	18	-	nS	V_{GS}=10V ， V_{DS}=30V, I_D=30A，R_G=25Ω
Turn-on Rise time	t_r	-	10	-		
Turn-off delay time	$t_{d(off)}$	-	64			
Turn-off Fall time	t_f	-	16	-		
Gate Total Charge	Q_G	-	74	-	nC	V_{GS}=10V, V_{DS}=20V, I_D=80A
Gate-Source Charge	Q_{gS}	-	22	-		
Gate-Drain Charge	Q_{gd}	-	15	-		
Drain-Source Diode Characteristics						
Body Diode Forward Voltage	V_{SD}	-	-	1.2	V	V_{GS}=0V, I_{SD}=80A, T_J= 25℃
Body Diode Forward Current	Is	-	-	180	A	-
Body Diode Reverse Recovery Time	T_{rr}	-	50	-	ns	TJ=25℃， I_{SD}=24A, V_{GS}=0V， d_i/d_t =100A/μs
Body Diode Reverse Recovery Charge	Q_{rr}	-	48	-	nC	

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TYPICAL CHARACTERISTICS

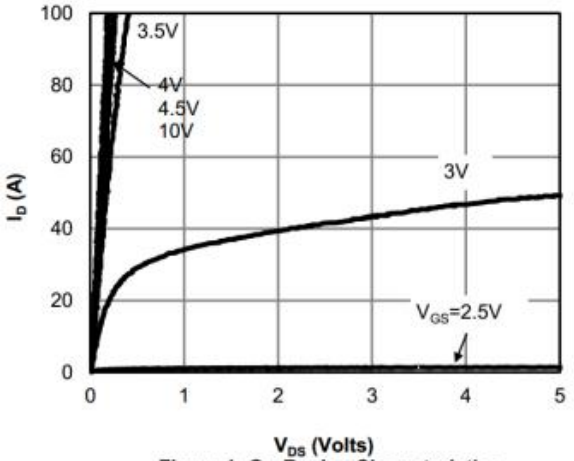

Figure 1: On Region Characteristics

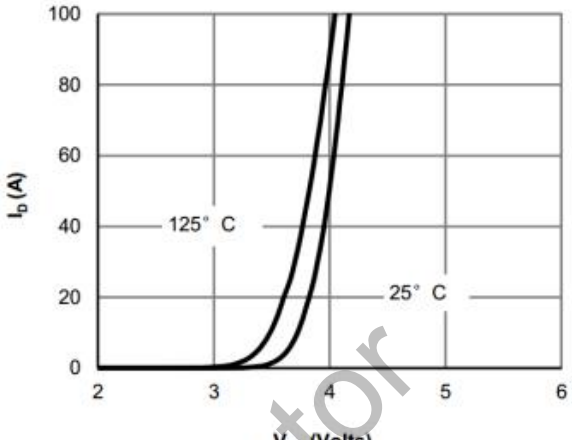

Figure 2: Transfer Characteristics

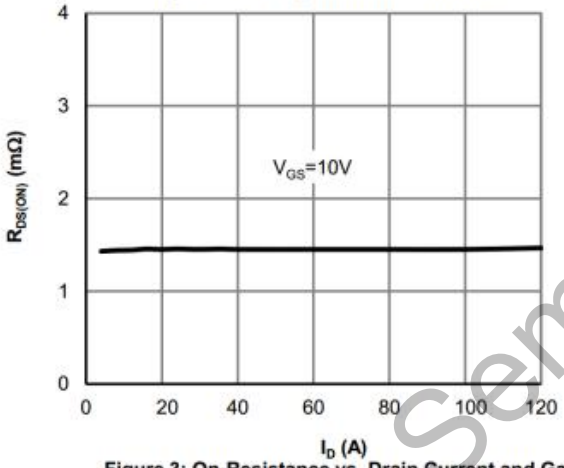

Figure 3: On-Resistance vs. Drain Current and Gate Voltage

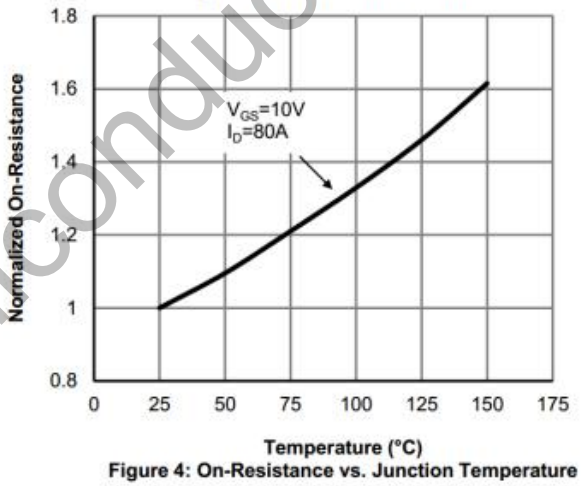

Figure 4: On-Resistance vs. Junction Temperature

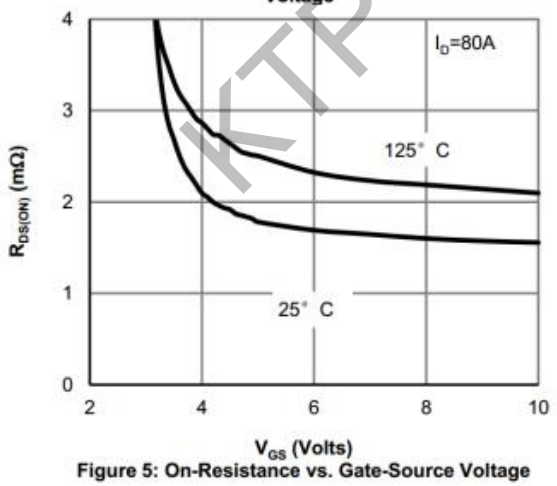

Figure 5: On-Resistance vs. Gate-Source Voltage

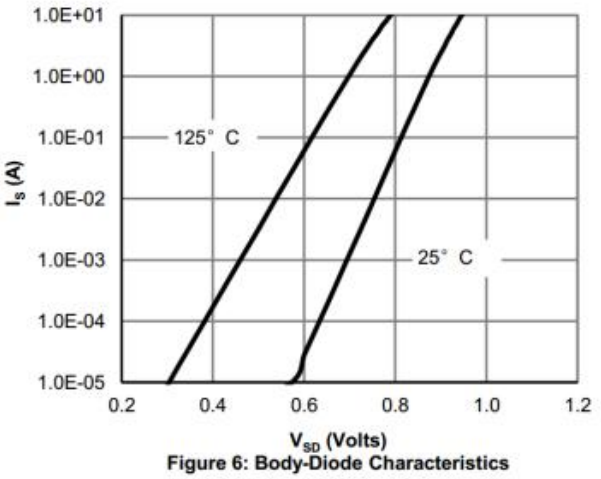

Figure 6: Body-Diode Characteristics

DATASHEET
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TYPICAL CHARACTERISTICS

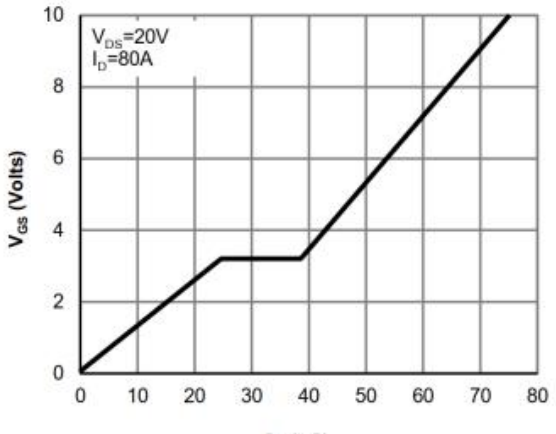

Figure 7: Gate-Charge Characteristics

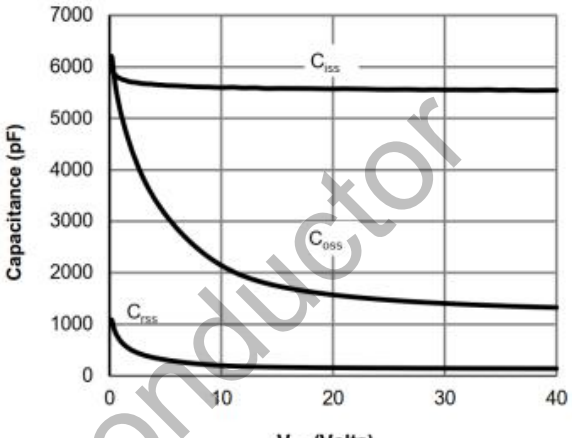

Figure 8: Capacitance Characteristics

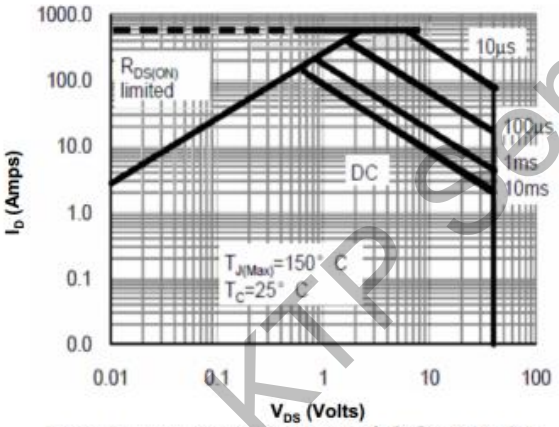

Figure 9: Maximum Forward Biased Safe Operating Area

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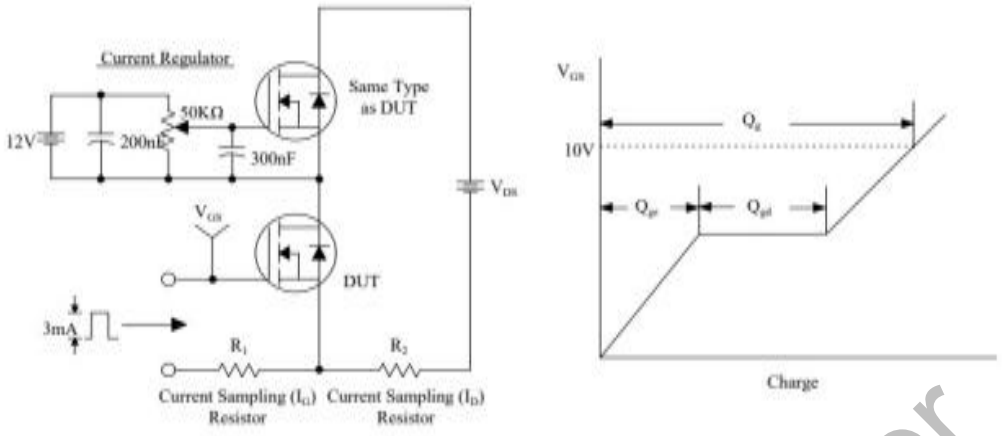
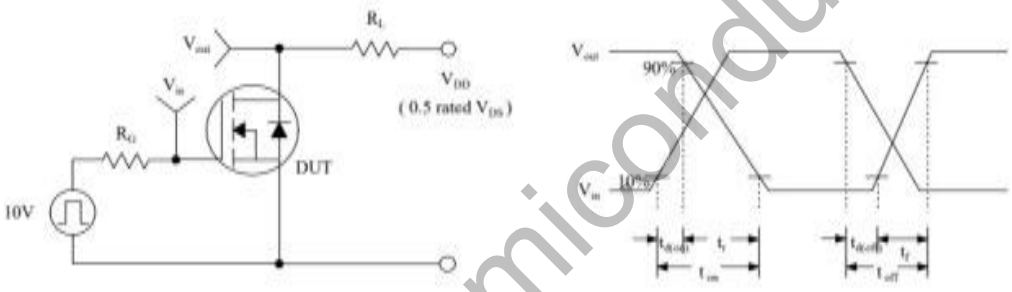
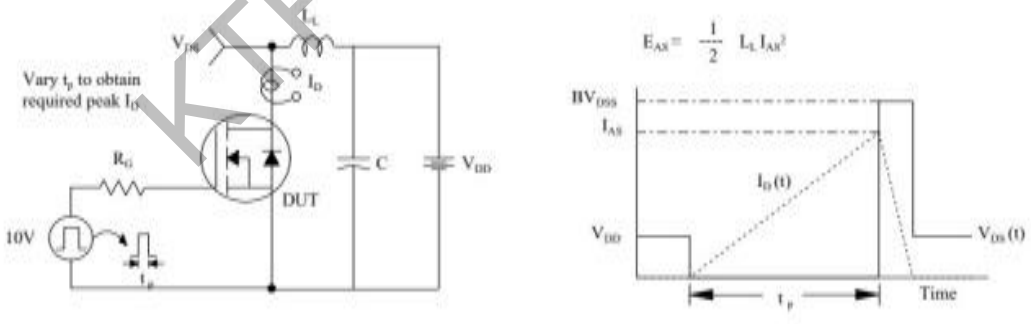
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching Test Circuit & Waveforms



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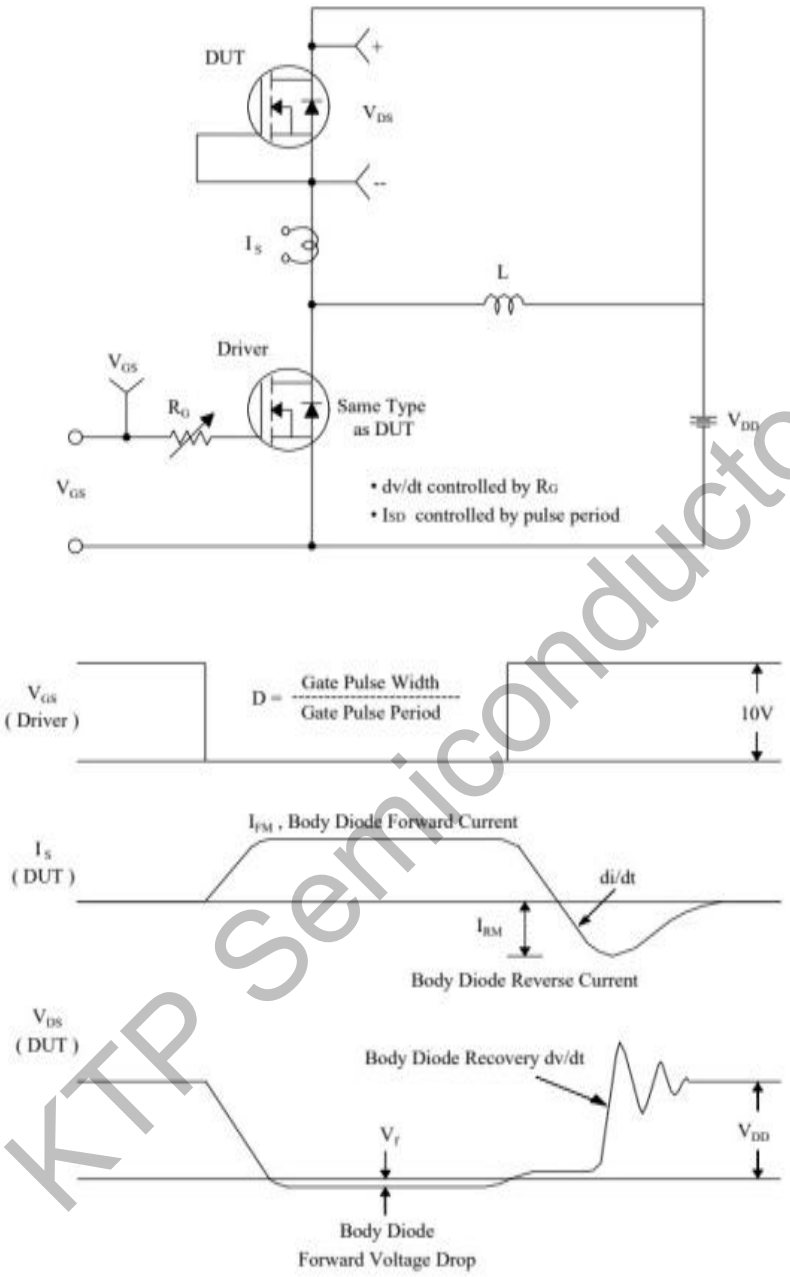
N-Channel Enhancement Mode Power MOSFET

Peak Diode Recovery dv/dt Test Circuit & Waveforms



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Package Information

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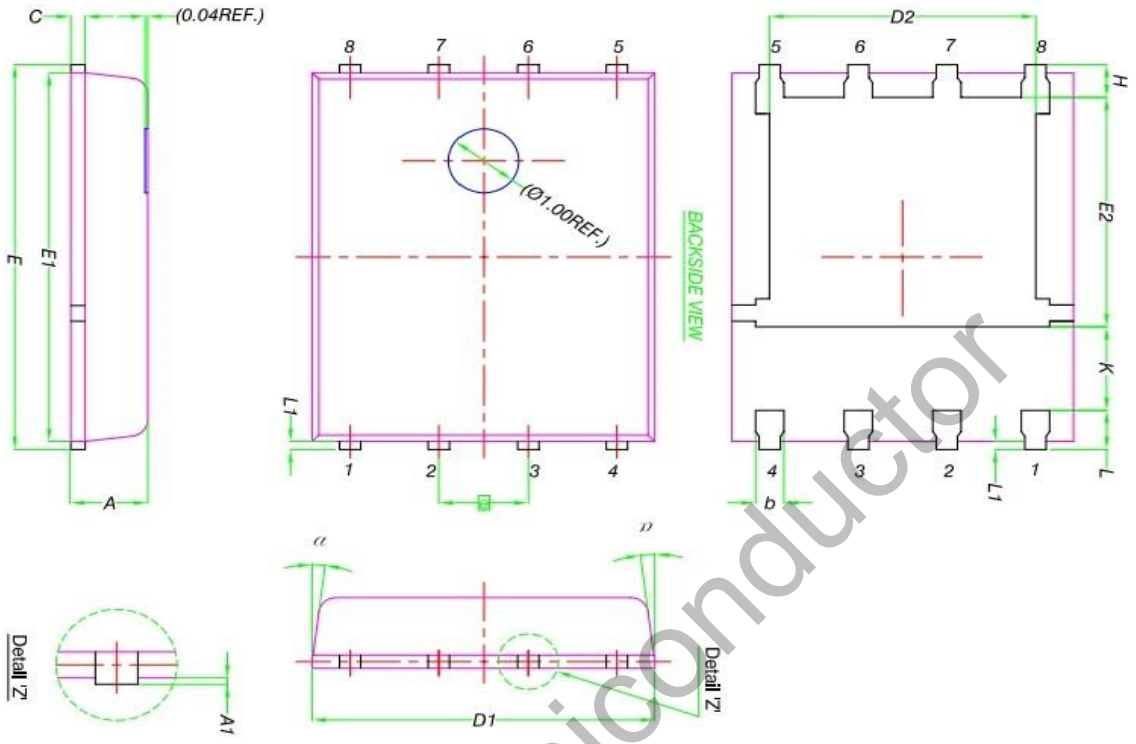

DIM.	MILLIMETERS		
	MIN.	NOM.	MAX.
A	0.90	1.00	1.10
A1	0	-	0.05
b	0.33	0.41	0.51
C	0.20	0.25	0.30
D1	4.80	4.90	5.00
D2	3.61	3.81	3.96
E	5.90	6.00	6.10
E1	5.70	5.75	5.80
E2	3.38	3.58	3.78
e	1.27 BSC		
H	0.41	0.51	0.61
K	1.10	-	-
L	0.51	0.61	0.71
L1	0.06	0.13	0.20
α	0°	-	12°

Land Pattern
(Only for Reference)