

**30V, 180A
N-CHANNEL POWER MOSFET**
Features
 $R_{DS(ON)} < 2.5m\Omega$ @ $V_{GS}=10V$
 $R_{DS(ON)} < 6.0m\Omega$ @ $V_{GS}=4.5V$

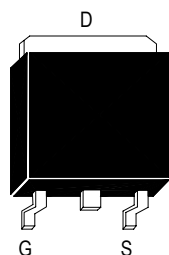
Advanced Trench Technology

 Provide Excellent $R_{DS(ON)}$ and Low Gate Charge

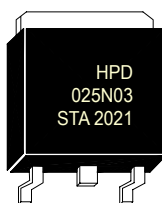
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Product Summary

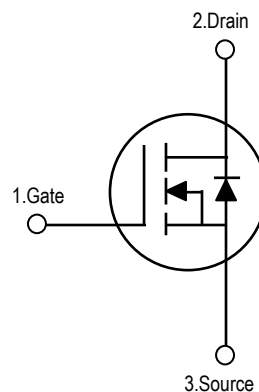
V_{DS}	30	V
$R_{DS(ON)}$ Max	2.5	m Ω
I_D	180	A



TO-252



Marking


ORDERING INFORMATION

Order Number	Package	Pin Assignment			Packing	Reel Size	Reel	Per Carton
		1	2	3			Pcs	Pcs
HPD025N03STA	TO-252	G	D	S	Tape Reel	13 Inch	2500	25000

Absolute Maximum Ratings ($T_C=25^{\circ}C$ unless otherwise specified)

Symbol	Parameter		Max.	Units
V_{DSS}	Drain-Source Voltage		30	V
V_{GSS}	Gate-Source Voltage		± 20	
I_D	Continuous Drain Current	$T_C=25^{\circ}C$	180	A
		$T_C=100^{\circ}C$	98	
I_{DM}	Pulsed Drain Current note1		600	
E_{AS}	Single Pulsed Avalanche Energy note2		225	mJ
P_D	Power Dissipation	$T_C=25^{\circ}C$	108	W
$R_{\theta JC}$	Thermal Resistance, Junction to Case		1.4	$^{\circ}C/W$
T_J, T_{STG}	Operating and Storage Temperature Range		-55 to +175	$^{\circ}C$

Electrical Characteristics ($T_C=25^{\circ}\text{C}$, unless otherwise specified)**Off Characteristic**

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V$, $I_D=250\mu A$	30	--	--	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=30V$, $V_{GS}=0V$	--	--	1.0	μA
I_{GSS}	Gate to Body Leakage Current	$V_{DS}=0V$, $V_{GS}=\pm 20V$	--	--	± 100	nA

On Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}$, $I_D=250\mu A$	1	1.6	2.5	V
$R_{DS(on)}$	Static Drain-Source on-Resistance (note3)	$V_{GS}=10V$, $I_D=30A$	--	2.0	2.5	m Ω
		$V_{GS}=4.5V$, $I_D=20A$	--	5.0	6.0	

Dynamic Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
C_{iss}	Input Capacitance	$V_{DS}=15V$ $V_{GS}=0V$ $f=1.0MHz$	--	3500	--	pF
C_{oss}	Output Capacitance		--	500	--	
C_{rss}	Reverse Transfer Capacitance		--	431	--	
Q_g	Total Gate Charge	$V_{DS}=15V$ $I_D=30A$ $V_{GS}=10V$	--	38	--	nC
Q_{gs}	Gate-Source Charge		--	9	--	
Q_{gd}	Gate-Drain("Miller") Charge		--	13	--	

Electrical Characteristics ($T_C=25^{\circ}\text{C}$, unless otherwise specified)**Switching Characteristics**

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$t_{d(on)}$	Turn-on Delay Time	$V_{DS}=15\text{V}$ $I_D=30\text{A}$ $R_{GEN}=3\Omega$ $V_{GS}=10\text{V}$	--	26	--	nS
t_r	Turn-on Rise Time		--	24	--	
$t_{d(off)}$	Turn-off Delay Time		--	91	--	
t_f	Turn-off Fall Time		--	39	--	

Drain-Source Diode Characteristics and Maximum Ratings

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Maximum Continuous Drain to Source Diode Forward Current		--	--	150	A
I_{SM}	Maximum Pulsed Drain to Source Diode Forward Current		--	--	600	
V_{SD}	Drain to Source Diode Forward Voltage	$V_{GS}=0\text{V}$, $I_S=30\text{A}$	--	--	1.2	V
t_{rr}	Body Diode Reverse Recovery Time	$I_F=20\text{A}$ $di/dt=100\text{A}/\mu\text{s}$	--	42	--	nS
Q_{rr}	Body Diode Reverse Recovery Charge		--	39	--	nC

Notes:

1、Repetitive Rating : Pulse Width Limited by Maximum Junction Temperature

2、EAS condition : $T_J=25^{\circ}\text{C}$, $V_{DD}=15\text{V}$, $V_G=10\text{V}$, $R_G=25\Omega$, $L=0.5\text{mH}$, $I_{AS}=30\text{A}$ 3、Pulse Test : Pulse Width $\leq 300\mu\text{s}$, Duty Cycle $\leq 0.5\%$

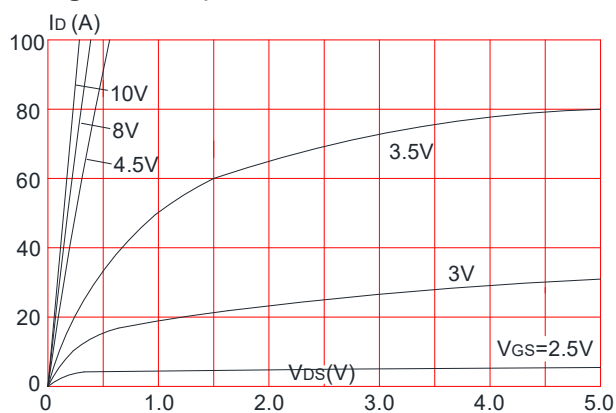
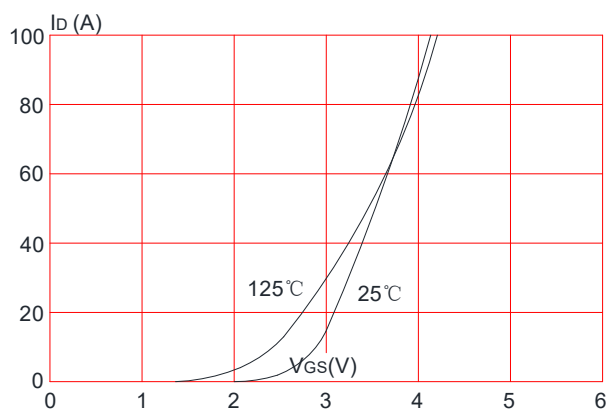
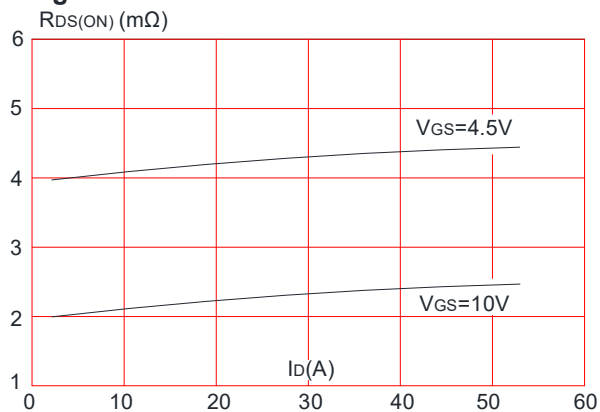
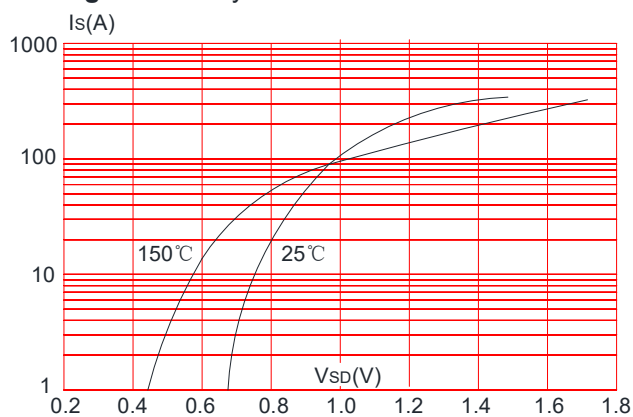
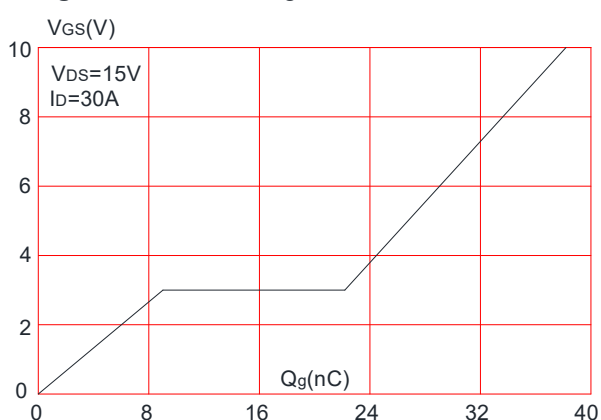
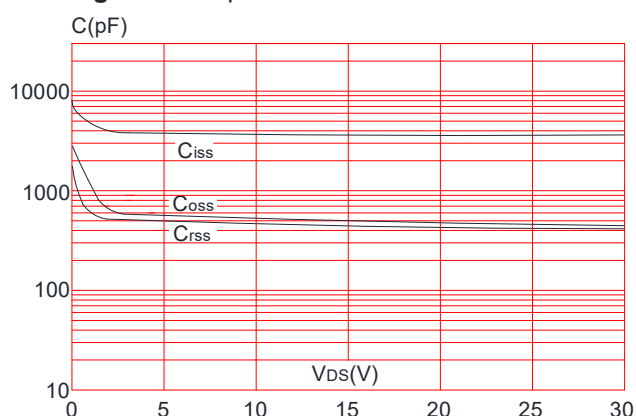
Figure1: Output Characteristics

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




Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

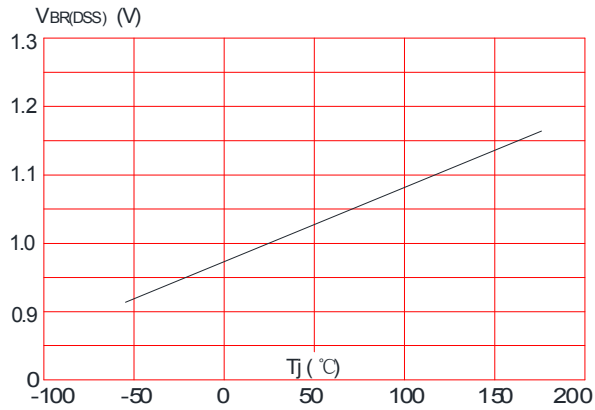


Figure 8: Normalized on Resistance vs. Junction Temperature

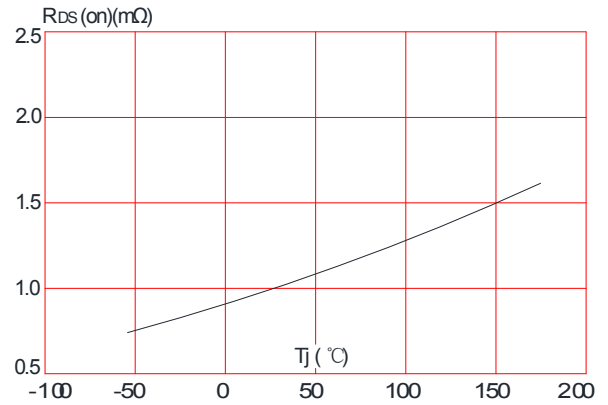


Figure 9: Maximum Safe Operating Area

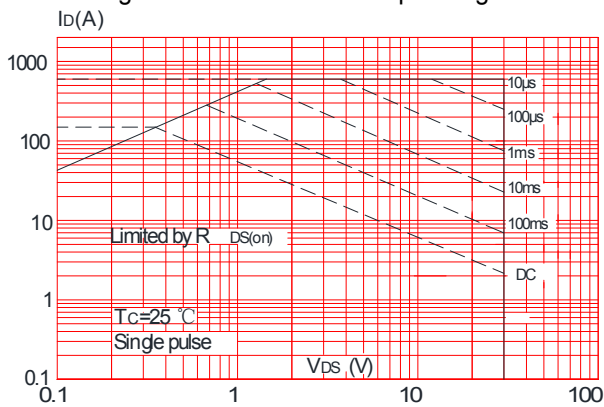


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

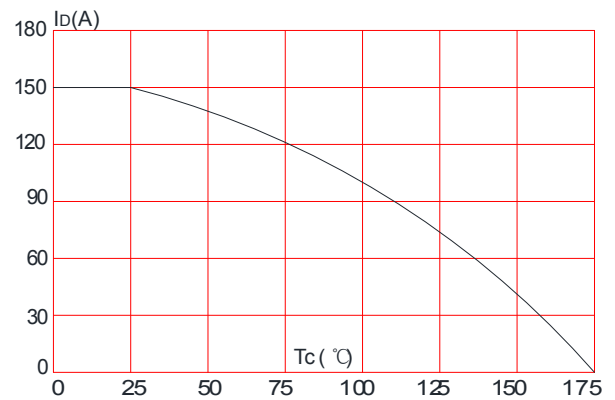
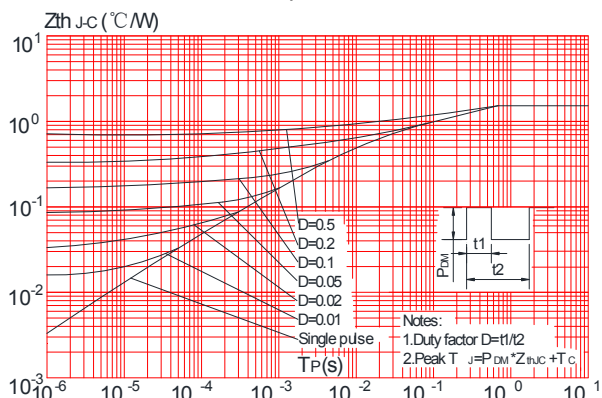


Figure 11: Maximum Effective Transient Thermal Impedance, Junction-to-Case





Test Circuit

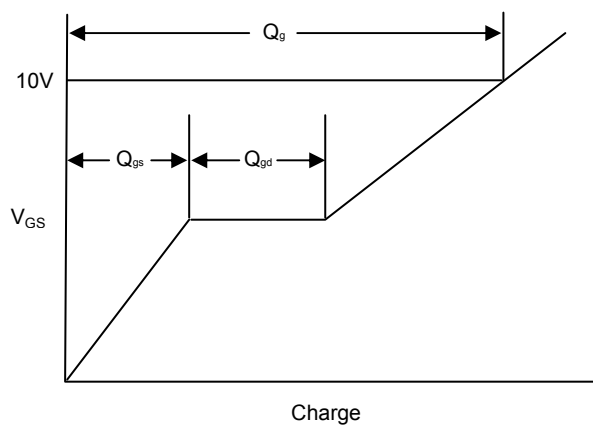
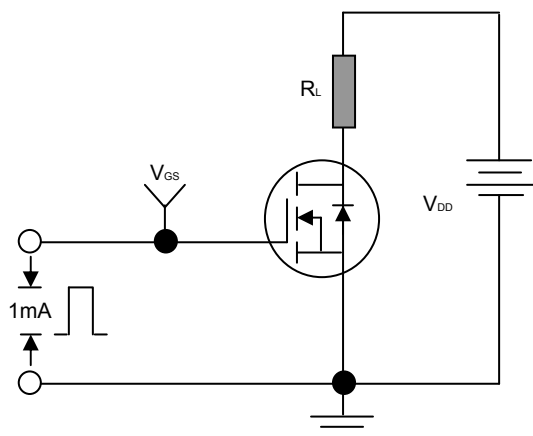


Fig-1: Gate Charge Test Circuit & Waveform

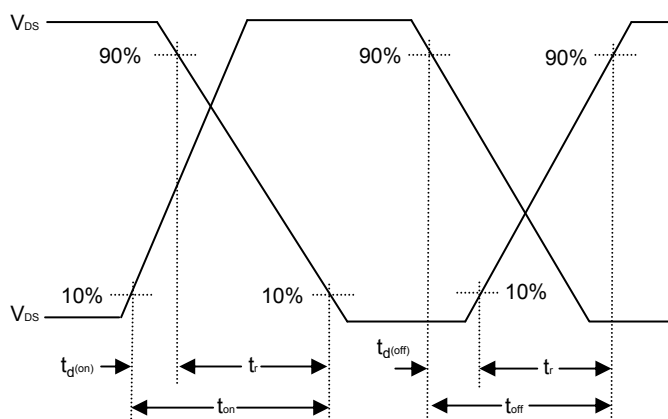
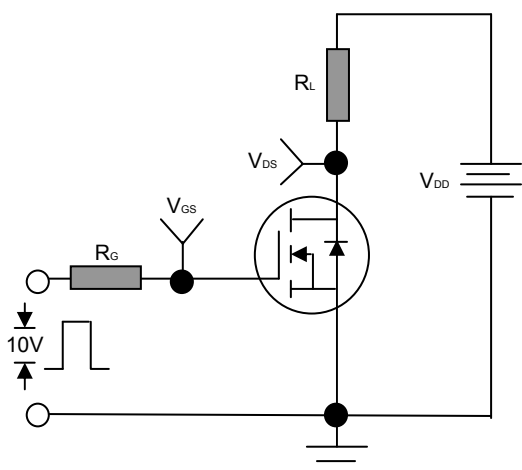


Fig-2: Resistive Switching Test Circuit & Waveforms

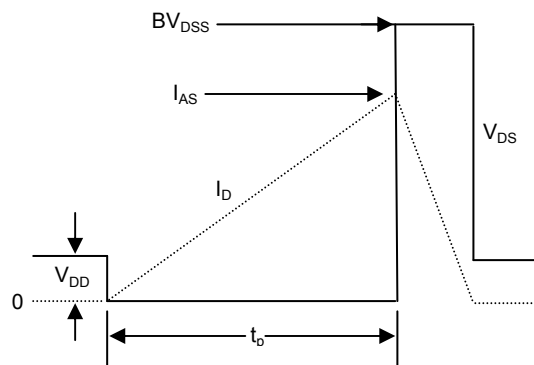
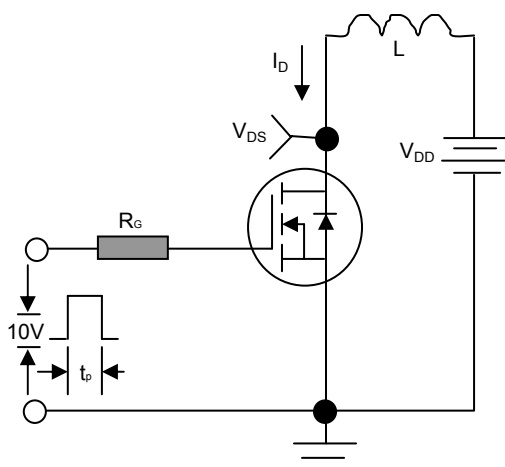


Fig-3: Unclamped Inductive Switching Test Circuit & Waveforms

TO-252 (DPAK) PACKAGE MECHANICAL DATA (mm & inch)

REF.	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	2.10	2.50	0.083	0.098
A2	0	0.10	0	0.004
B	0.66	0.86	0.026	0.034
B2	5.18	5.48	0.202	0.216
C	0.40	0.60	0.016	0.024
C2	0.44	0.58	0.017	0.023
D	5.90	6.30	0.232	0.248
D1	5.30 REF		0.209 REF	
E	6.40	6.80	0.252	0.268
E1	4.63		0.182	
G	4.47	4.67	0.176	0.184
H	9.50	10.7	0.374	0.421
L	1.09	1.21	0.043	0.048
L2	1.35	1.65	0.053	0.065
V1	7° TYP.		7° TYP.	
V2	0°	6°	0°	6°

TO-252 Reel Specification

REF.	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
W	15.90	16.10	0.626	0.634
E	1.65	1.85	0.065	0.073
F	7.40	7.60	0.291	0.299
D0	1.40	1.60	0.055	0.063
D1	1.40	1.60	0.055	0.063
P0	3.90	4.10	0.154	0.161
P1	7.90	8.10	0.311	0.319
P2	1.90	2.10	0.075	0.083
A0	6.85	7.00	0.270	0.276
B0	10.45	10.60	0.411	0.417
K0	2.63	2.88	0.105	0.113
T	0.24	0.27	0.009	0.011
t1	0.10		0.004	
10P0	39.80	40.20	1.567	1.583



经中华人民共和国工商行政管理总局商标局批准

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