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TPM3080ND56-L

30V N-Channel MOSFET
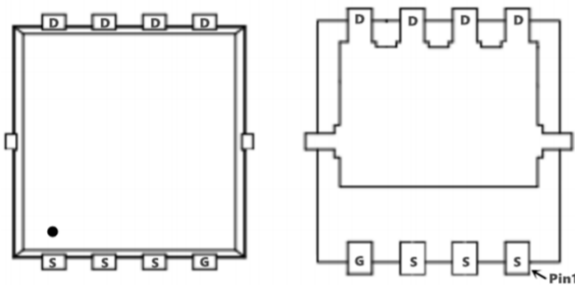
Product Summary

◆ V_{DS} = 30V I $_D$ = 80 A

◆ $R_{DS(ON)}$ < 5.5 mΩ @ V_{GS}=10V

◆ $R_{DS(ON)}$ < 6.5 mΩ @ V_{GS}=4.5V

Application

◆ Load/Power switch
◆ Interfacing, logic switching
◆ Battery management for ultra protable
◆ electronics

Package and Pin Configuration

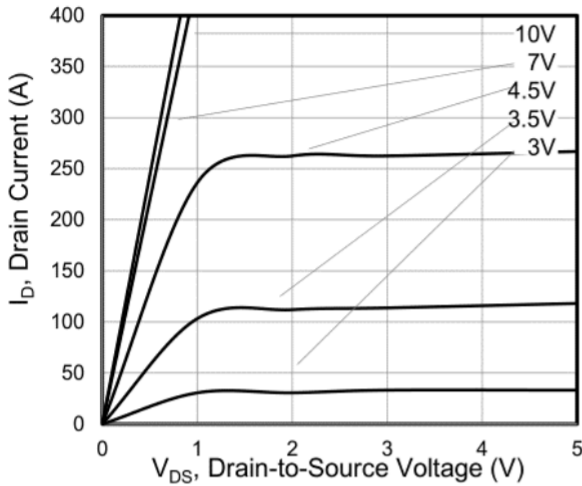**Circuit diagram**

PDFN5*6-8L

Marking:80N03

Absolute Maximum Ratings (T_A=25°C unless otherwise specified)

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	30	V
V_{GS}	Gate-Source Voltage	±20	V
I_D@T_C=25°C	Continuous Drain Current, V_{GS} @ 10V[1,6]	80	A
I_D@T_C=100°C	Continuous Drain Current, V_{GS} @ 10V[1,6]	68	A
I_{DM}	Pulsed Drain Current[2]	216	A
EAS	Single Pulse Avalanche Energy[3]	144.7	mJ
I_{AS}	Avalanche Current	53.8	A
P_D@T_C=25°C	Total Power Dissipation[4]	69	W
P_D@T_A=25°C	Total Power Dissipation[4]	5	W
T_{STG}	Storage Temperature Range	-55 to 175	°C
T_J	Operating Junction Temperature Range	-55 to 175	°C
$R_{θJA}$	Thermal Resistance Junction-Ambient [1]	62	°C/W
$R_{θJA}$	Thermal Resistance Junction-Ambient [1] (t ≤10s)	25	°C/W
$R_{θJC}$	Thermal Resistance Junction-Case[1]	1.8	°C/W

Electrical Characteristics (T =25°C unless otherwise specified)

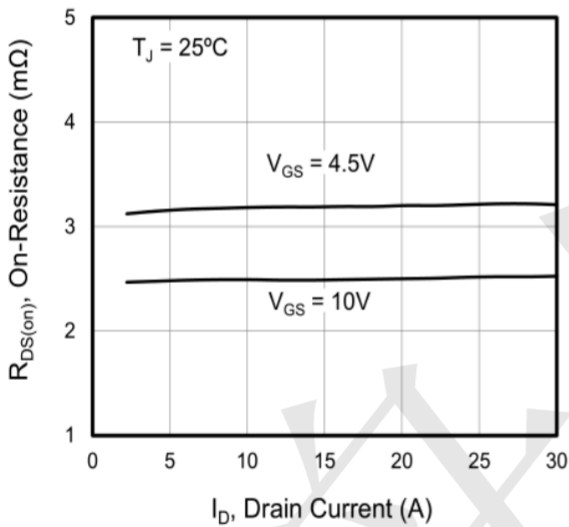| Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V , I_D=250uA	30	---	---	V
$\Delta BV_{DSS}/\Delta T_J$	BVDSS Temperature Coefficient	Reference to 25°C , I_D=1mA	---	0.0213	---	V/°C
$R_{DS(ON)}$	Static Drain-Source On-Resistance[2]	V_{GS}=10V , I_D=30A	---	4.3	5.5	mΩ
		V_{GS}=4.5V , I_D=15A	---	4.8	6.5	
$V_{GS(th)}$	Gate Threshold Voltage		1.2	1.7	2.5	V
$\Delta V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient	V_{GS}=V_{DS} , I_D =250uA	---	-5.73	---	mV/°C
I_{DSS}	Drain-Source Leakage Current	V_{DS}=24V , V_{GS}=0V , T_J=25°C	---	---	1	uA
		V_{DS}=24V , V_{GS}=0V , T_J=55°C	---	---	5	
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±20V , V_{DS}=0V	---	---	±100	nA
gfs	Forward Transconductance	V_{DS}=5V , I_D=30A	---	26.5	---	S
R_g	Gate Resistance	V_{DS}=0V , V_{GS}=0V , f=1MHz	---	1.4	---	
Q_g	Total Gate Charge (4.5V)	V_{DS}=15V , V_{GS}=4.5V , I_D=15A	---	98	---	nC
Q_{gs}	Gate-Source Charge		---	11	---	
Q_{gd}	Gate-Drain Charge		---	21	---	
$T_{d(on)}$	Turn-On Delay Time	V_{DD}=15V , V_{GS}=10V , R_G=3.3 I_D=15A	---	17	---	ns
T_r	Rise Time		---	41	---	
$T_{d(off)}$	Turn-Off Delay Time		---	55	---	
T_f	Fall Time		---	66	---	
C_{iss}	Input Capacitance	V_{DS}=15V , V_{GS}=0V , f=1MHz	---	5471	---	pF
C_{oss}	Output Capacitance		---	1628	---	
C_{rss}	Reverse Transfer Capacitance		---	1026	---	
I_S	Continuous Source Current[1,5]	V_G=V_D=0V , Force Current	---	---	130	A
I_{SM}	Pulsed Source Current[2,5]		---	---	520	A
V_{SD}	Diode Forward Voltage[2]	V_{GS}=0V , I_S=1A , T_J=25°C	---	---	1.2	V

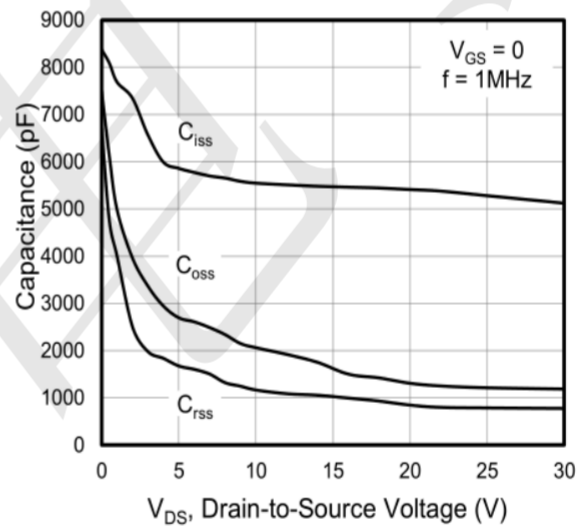# Typical Electrical and Thermal Characteristic Curves
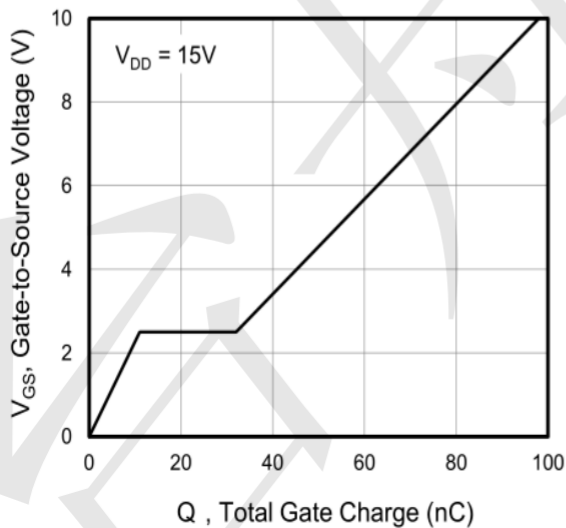
Figure 1. Output Characteristics
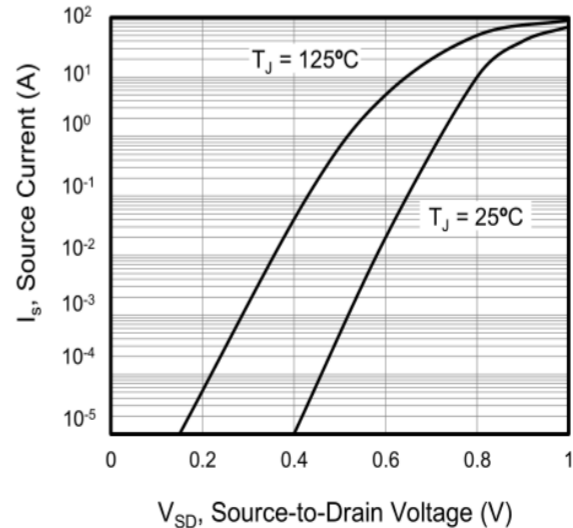
Figure 2. Transfer Characteristics

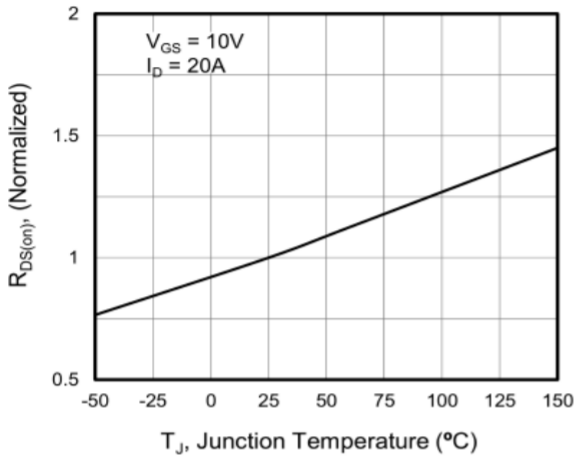**Figure 3. On-Resistance vs. Drain Current**
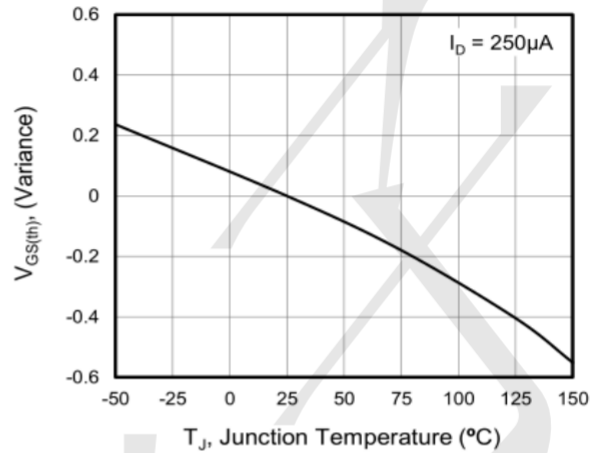
Figure 4. Capacitance

Figure 5. Gate Charge
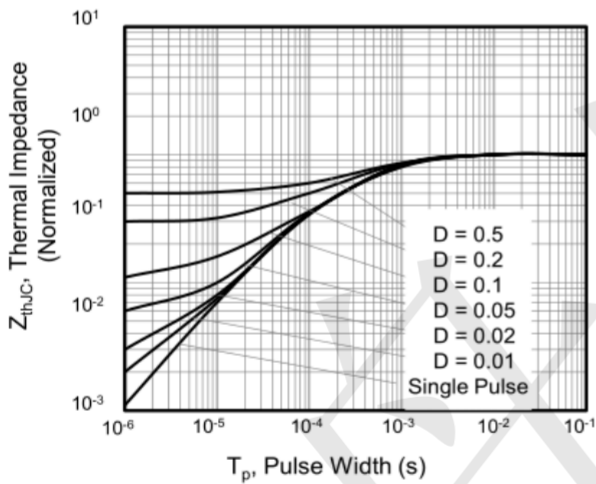
Figure 6. Body Diode Forward Voltage

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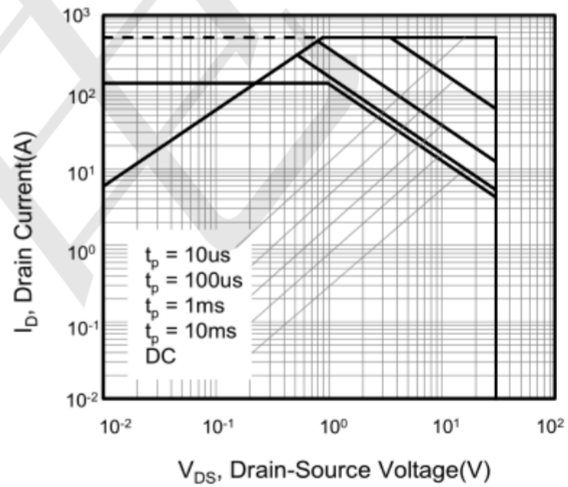# Typical Electrical and Thermal Characteristic Curves

Figure 7. On-Resistance vs.Junction Temperature

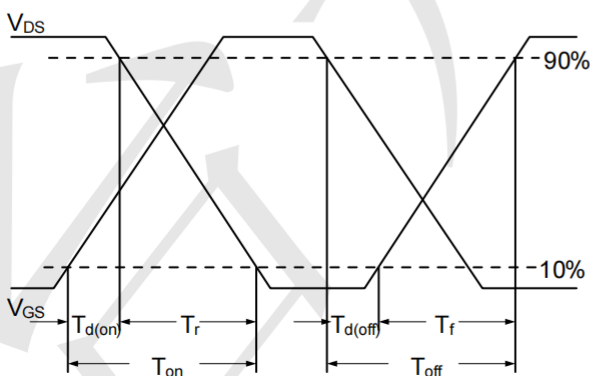

Figure 8. Threshold Voltage vs.Junction Temperature

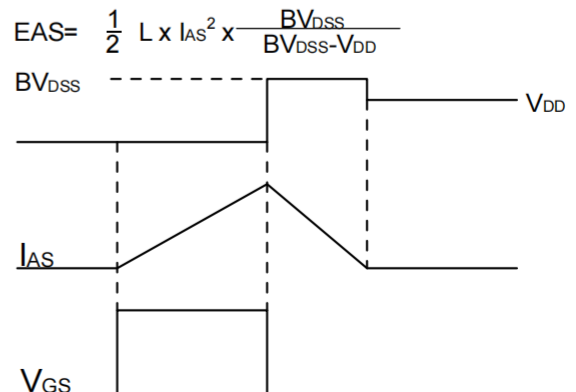**Figure 9. Transient Thermal Impedance**

Figure 10. Safe operation area

Fig.11 Switching Time Waveform

$$EAS= \frac{1}{2} L \times I_{AS}^2 \times \frac{BV_{DSS}}{BV_{DSS}-V_{DD}}$$

Fig.12 Unclamped Inductive Switching Waveform

Package Outline Dimensions DFN5*6-8L

Symbol	Common			
	mm		Inch	
	Mim	Max	Min	Max
A	1.03	1.17	0.0406	0.0461
b	0.34	0.48	0.0134	0.0189
c	0.824	0.0970	0.0324	0.082
D	4.80	5.40	0.1890	0.2126
D1	4.11	4.31	0.1618	0.1697
D2	4.80	5.00	0.1890	0.1969
E	5.95	6.15	0.2343	0.2421
E1	5.65	5.85	0.2224	0.2303
E2	1.60	/	0.0630	/
e	1.27 BSC		0.05 BSC	
L	0.05	0.25	0.0020	0.0098
L1	0.38	0.50	0.0150	0.0197
L2	0.38	0.50	0.0150	0.0197
H	3.30	3.50	0.1299	0.1378
I	/	0.18	/	0.0070

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