

Description

The DMN6070SY

is the new generation trench N-ch MOSFET has been designed to minimize the on-state resistance ($R_{DS(ON)}$) yet maintain superior switching performance, making it ideal for high efficiency power management applications

Features

- Low Gate Threshold Voltage
- Fast Switching Speed
- for extremely low $R_{DS(ON)}$
- Lead-Free, Halogen-Free; RoHS Compliant

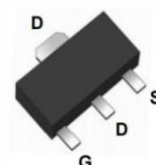
Applications

- Power-management functions
- Industrial DC/DC Conversion Circuits
- Backlighting

V_{DSS}	60V
I_D	4.2A
$R_{DS(ON) Typ}$	65mΩ@ $V_{GS}=10V$

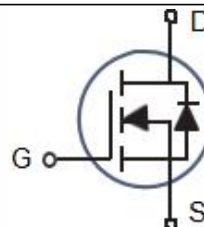
Outline

SOT-89 Pin Configuration



Equivalent

- (1) Gate
- (2) Source
- (3) Drain



Packaging specifications

Part No.	Package	Marking	Basic ordering unit.(pcs)
DMN6070SY	SOT-89		1000

Absolute Maximum Ratings

Parameter		Symbol	Limit	Units
Drain-Source Voltage		V_{DS}	60	V
Gate-Source Voltage		V_{GS}	±20	V
Drain Current-Continuous ^(Note2)	$T_C=25^{\circ}C$	I_D	4.2	A
	$T_C=70^{\circ}C$		3.4	A
-Pulsed ^(Note 1· Note 2)		I_{DM}	15	A
Maximum Power Dissipation	$T_C=25^{\circ}C$	P_D	2.1	W
	$T_C=70^{\circ}C$		1.68	W
Operating Junction and Storage Temperature Range		T_J, T_{STG}	-55 to 150	°C
Thermal Resistance Junction-Ambient		$R_{\theta JA}$	58	°C /W
Thermal Resistance Junction-Case		$R_{\theta JC}$	12	°C/W

Electrical Characteristics (T_C=25 °C, unless otherwise noted)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V , I _D =250uA	60			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =60V , V _{GS} =0V			1	uA
Gate-Body Leakage Current	I _{GSS}	V _{GS} = ±20V , V _{DS} =0V			±100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D =250uA	1.0	1.5	2.2	V
Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} =10V , I _D =2.6A		65	85	mΩ
		V _{GS} =4.5V , I _D =2A		78	98	mΩ
Forward Transconductance	g _{FS}	V _{DS} =10V , I _D =1A		4.6		S
DYNAMIC CHARACTERISTICS Note4						
Input Capacitance	C _{ISS}	V _{DS} =30V , V _{GS} =0 V , f =1.0MHz		380		pF
Output Capacitance	C _{OSS}			17		pF
Reverse Transfer Capacitance	C _{RSS}			15		pF
Gate resistance	R _g	V _{GS} =0V,V _{DS} =0V, f=1MHz		12		Ω
Total Gate Charge	Q _g	V _{DS} =30V , I _D =3A , V _{GS} =10V		10.6		nC
Gate-Source Charge	Q _{gs}			1.7		nC
Gate-Drain Charge	Q _{gd}			1.9		nC
SWITCHING CHARACTERISTICS Note4						
Turn-On Delay Time	t _{D(ON)}	V _{DD} =30V , I _D =1A , V _{GS} =10V , R _{GEN} =10 Ω		4.2		ns
Rise Time	t _r			5.3		ns
Turn-Off Delay Time	t _{D(OFF)}			25		ns
Fall Time	t _f			11.8		ns
DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS						
Diode Forward Voltage	V _{SD}	V _{GS} =0V , I _S =3A		0.7	1.0	V

Notes:

- 1、Pulse Test Width < 300us,Duty Cycle< 2%
- 2、Drain current limited by maximum junction temperature.
- 3、Guaranteed by design,not subject to production testing.

Typical Performance Characteristics

Fig.1 Continuous Drain Current vs. TC

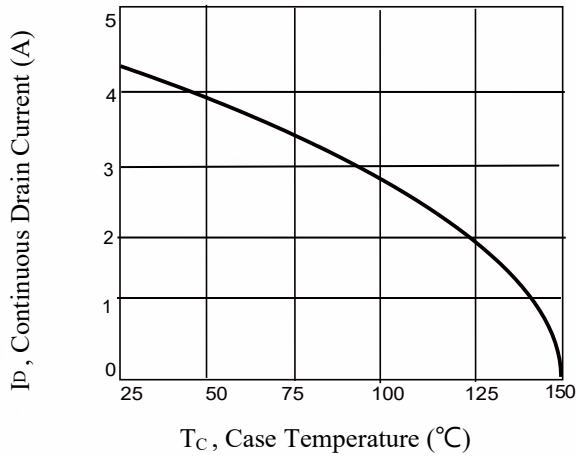


Fig.2 Normalized $R_{DS(ON)}$ vs. T_J

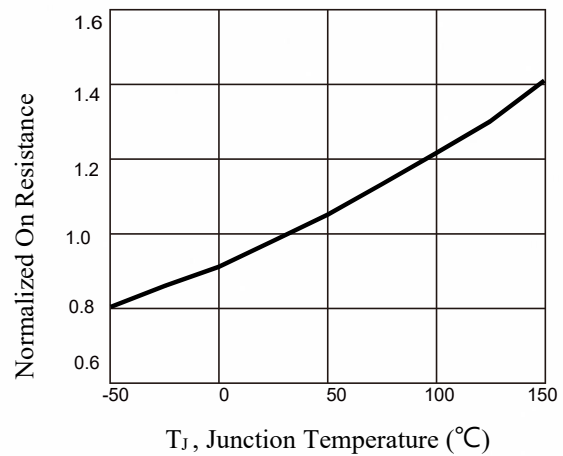


Fig.3 Normalized V_{th} vs. T_J

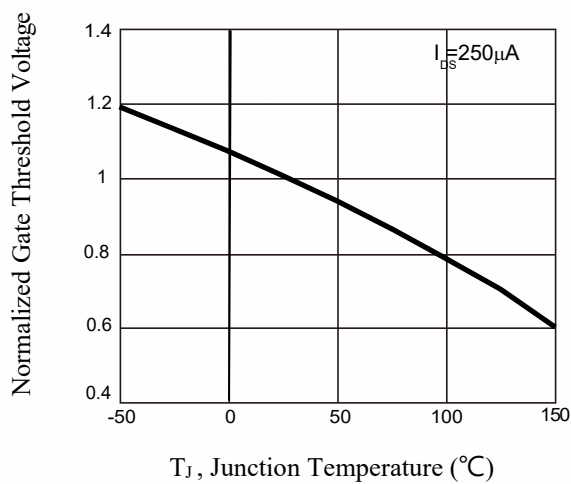


Fig.4 Gate Charge Waveform

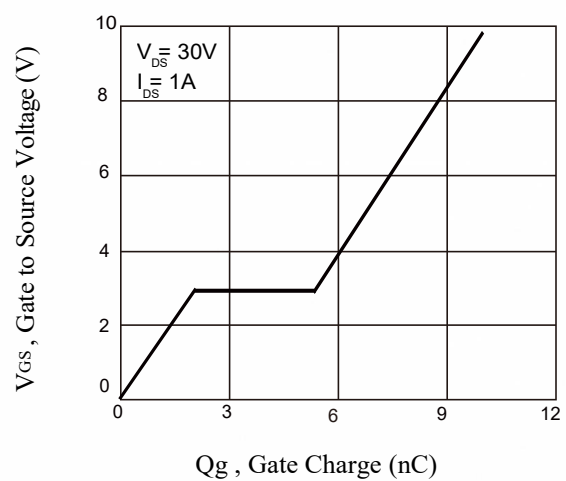


Fig.5 Typical Output Characteristics

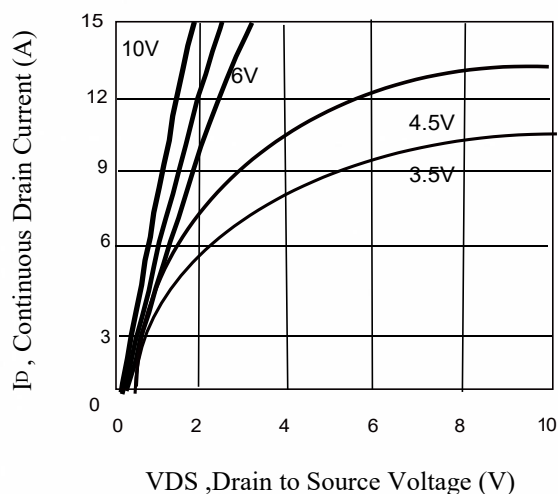


Fig.6 Turn-On Resistance vs. I_D

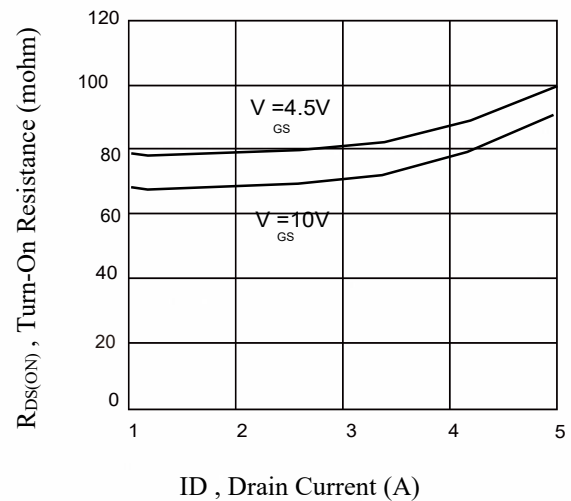


Fig.7 Capacitance

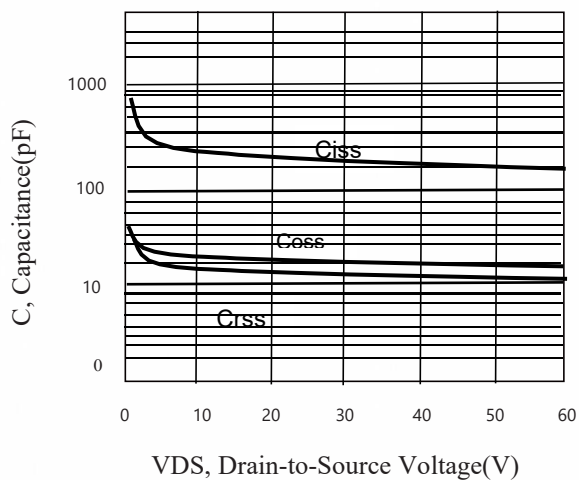


Fig.8 Typical Source-Drain Diode Forward Voltage

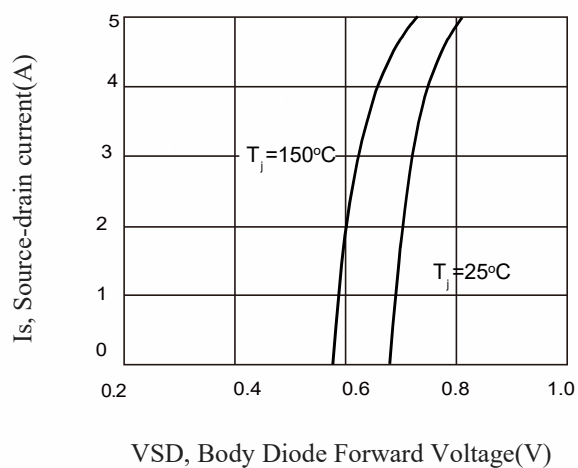


Fig.9 Normalized Transient Impedance

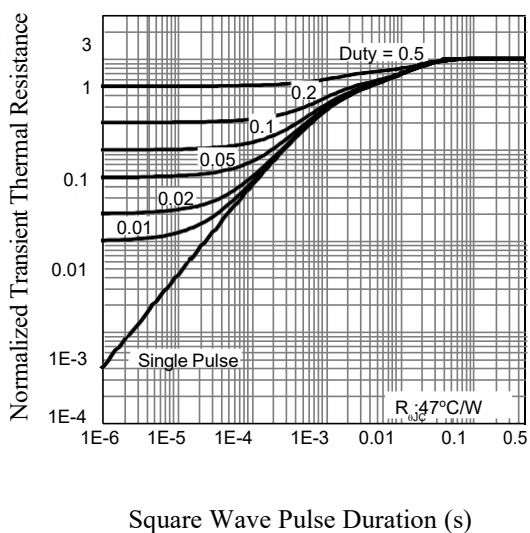


Fig.10 Maximum Safe Operation Area

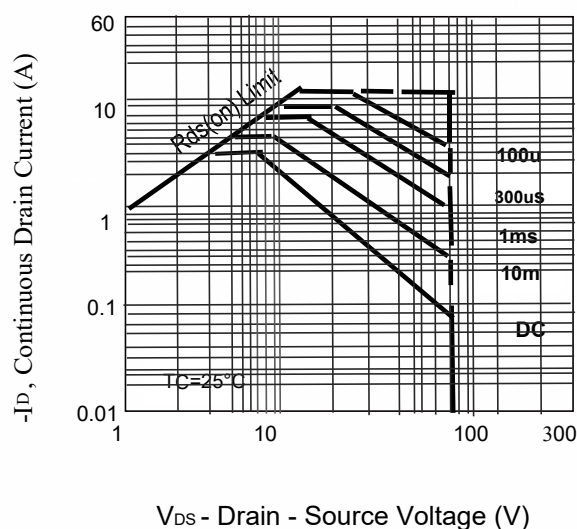


Figure11a. Switching Test Circuit

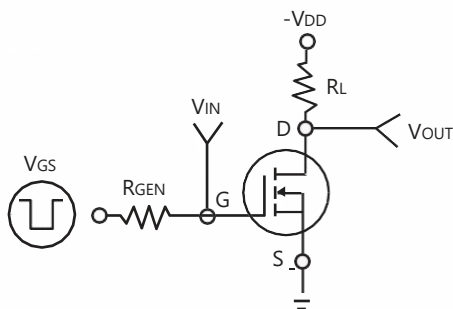
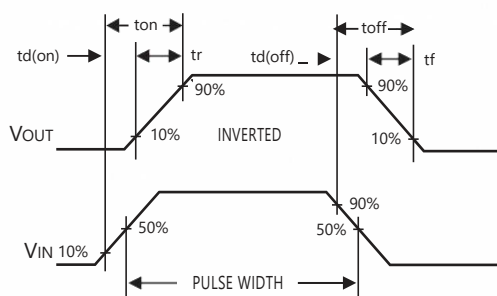
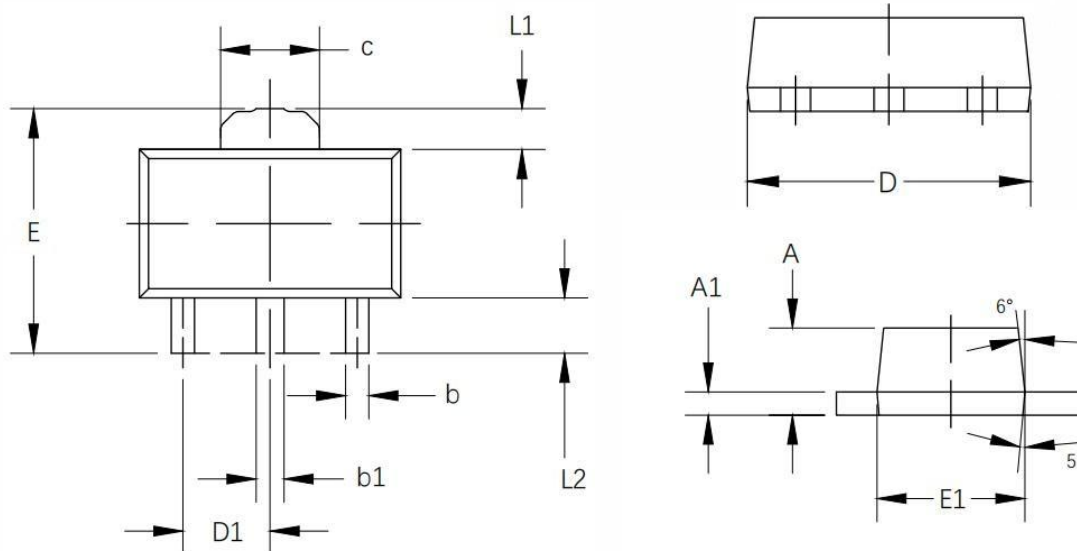


Figure11b. Switching Waveforms



SOT-89 Package Information



COMMON
DIMENSION(MM)

SYMBOL	MIN	TYP	MAX
A	1.450	1.500	1.550
A1	0.373	0.381	0.389
b	0.415	0.440	0.465
b1	0.495	0.520	0.545
c	1.675	1.700	1.725
D	4.445	4.500	4.550
D1	1.470	1.500	1.550
E	4.100	4.200	4.300
E1	2.450	2.500	2.550
L1	0.630	0.680	0.730
L2	0.890	0.940	0.990

NOTICE

NKGL reserves the to make modifications,enhancements,improvements,corrections or other changes without further notice to any product herein.NKGL does not assume any liability arising out of the application or use of any product described herein.