

TMN6018S

N-Channel Enhancement Mosfet

General Description

- Low $R_{DS(ON)}$
- RoHS and Halogen-Free Compliant

Applications

- Load switch
- PWM

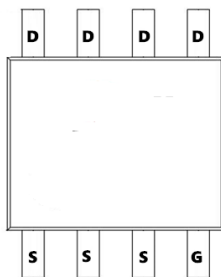
General Features

$V_{DS} = 60V$ $I_D = 18A$

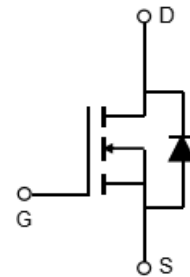
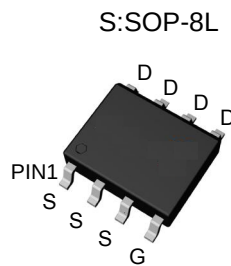
$R_{DS(ON)} = 13 m\Omega (typ.) @ V_{GS} = 10V$

100% UIS Tested

100% R_g Tested



PIN1
Marking: 18N06



Absolute Maximum Ratings: ($T_A = 25^\circ C$ unless otherwise noted)

Symbol	Parameter	Ratings	Units
V_{DS}	Drain-Source Voltage	60	V
V_{GS}	Gate-Source Voltage	± 20	V
I_D	Continuous Drain Current- $T_A = 25^\circ C$	18	A
	Continuous Drain Current- $T_A = 100^\circ C$	5.6	
I_{DM}	Drain Current-Pulsed ¹	32	A
P_D	Power Dissipation	2.1	W
T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55 to +150	$^\circ C$

Thermal Characteristics:

Symbol	Parameter	Max	Units
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	60	$^\circ C/W$

TMN6018S
N-Channel Enhancement Mosfet
Electrical Characteristics: ($T_A=25^{\circ}\text{C}$ unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Off Characteristics						
BV _{DSS}	Drain-Sourtce Breakdown Voltage	V _{GS} =0V, I _D =250 μ A	60	---	---	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{GS} =0V, V _{DS} =60V, T _C =25 °C	---	---	1	μ A
		V _{GS} =0V, V _{DS} =60V, T _C =125 °C	---	---	100	μ A
I _{GSS}	Gate-Source Leakage Current	V _{GS} =± 20V, V _{DS} =0A	---	---	± 100	nA
On Characteristics						
V _{GS(th)}	GATE-Source Threshold Voltage	V _{GS} =V _{DS} , I _D =250 μ A	1.2	1.8	2.5	V
R _{DS(ON)}	Drain-Source On Resistance ²	V _{GS} =10V, I _D =8A	---	13	17	m Ω
		V _{GS} =4.5V, I _D =4A	---	18	22	
Dynamic Characteristics						
C _{iss}	Input Capacitance ⁴	V _{DS} =30V, V _{GS} =0V, f=1MHz	---	1888	---	pF
C _{oss}	Output Capacitance ⁴		---	112	---	
C _{rss}	Reverse Transfer Capacitance ⁴		---	91	---	
Switching Characteristics						
t _{d(on)}	Turn-On Delay Time ^{2,3}	V _{DD} =30V, I _D =20A R _G =3 Ω . V _{GS} =10V	---	6.7	---	ns
t _r	Rise Time ^{2,3}		---	3.3	---	ns
t _{d(off)}	Turn-Off Delay Time ^{2,3}		---	21	---	ns
t _f	Fall Time ^{2,3}		---	6.2	---	ns
Q _g	Total Gate Charge	V _{GS} =10V, V _{DS} =30V, I _D =20A	---	39	---	nC
Q _{gs}	Gate-Source Charge		---	7.7	---	nC
Q _{gd}	Gate-Drain “Miller” Charge		---	8.3	---	nC
Drain-Source Diode Characteristics						
V _{SD}	Diode Forward Voltage ³	V _{GS} =0V I _S =20A T _J =25 °C	---	---	1.2	V
I _S	Source drain current(Body Diode)	VD=VG=0V	---	---	18	A
T _{rr}	Reverse Recovery Time	I _F =20A, di _F /dt=100A/μs	---	29	---	nS
Q _{rr}	Reverse Recovery Charge		---	21	---	nC

Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, $t \leq 10$ sec.
3. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.
4. Guaranteed by design, not subject to production

Typical Characteristics: ($T_A=25^\circ\text{C}$ unless otherwise noted)

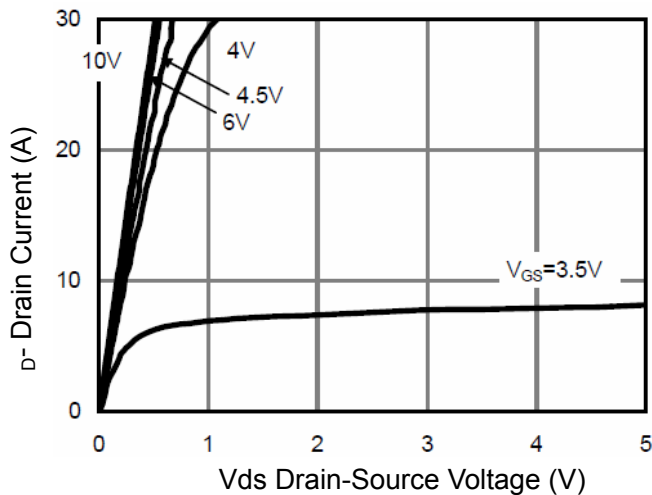


Figure 1 Output Characteristics

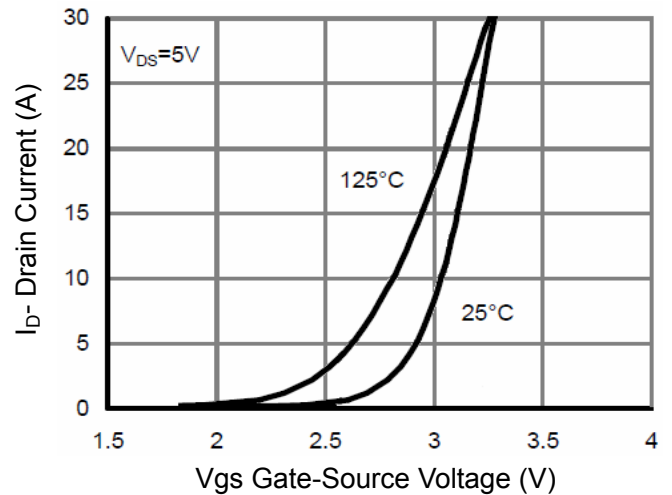


Figure 2 Transfer Characteristics

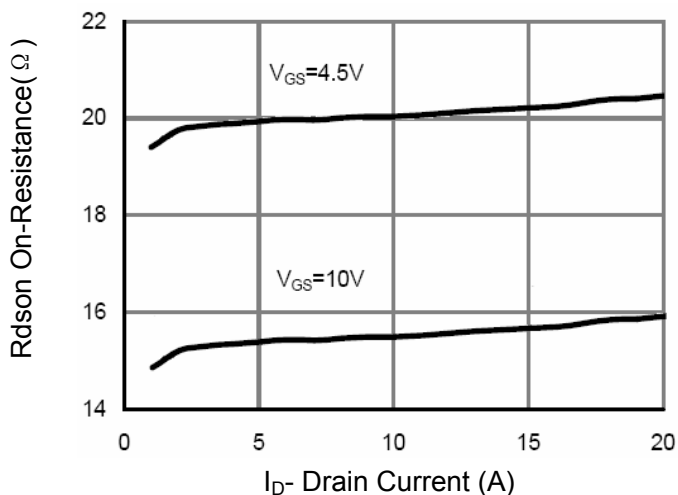


Figure 3 $R_{DS(on)}$ - Drain Current

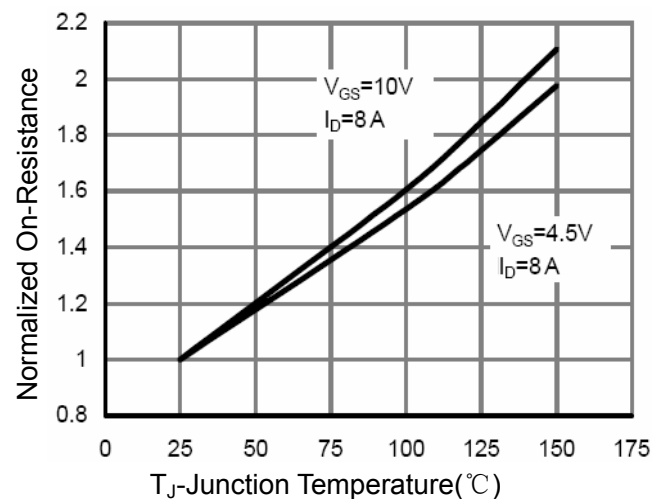


Figure 4 $R_{DS(on)}$ -Junction Temperature

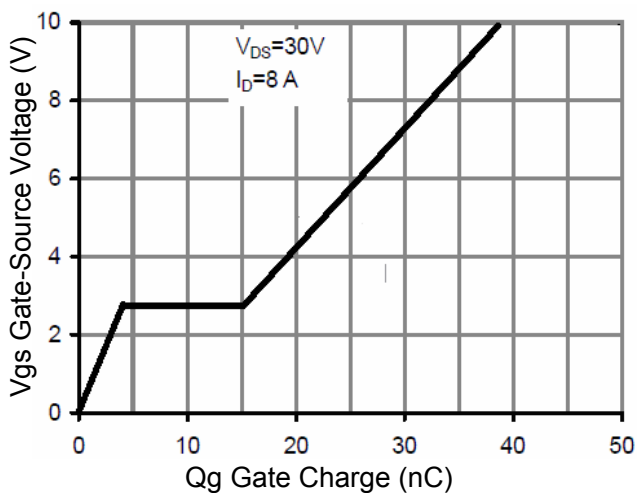


Figure 5 Gate Charge

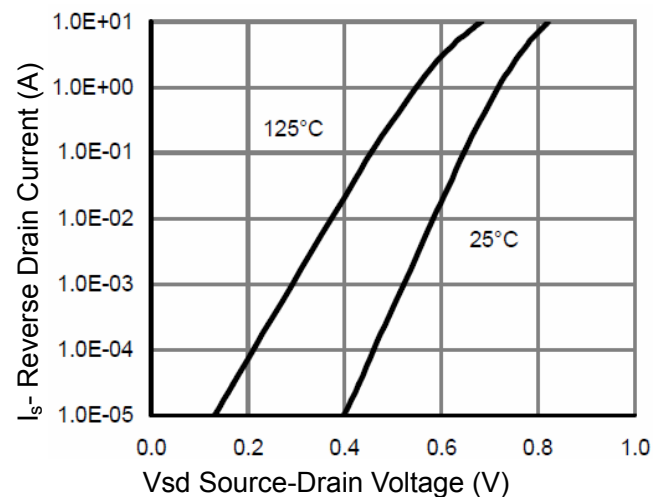


Figure 6 Source- Drain Diode Forward

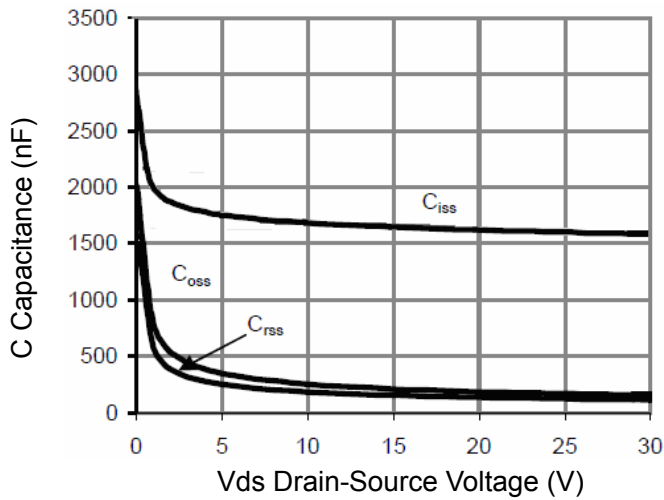


Figure 7 Capacitance vs Vds

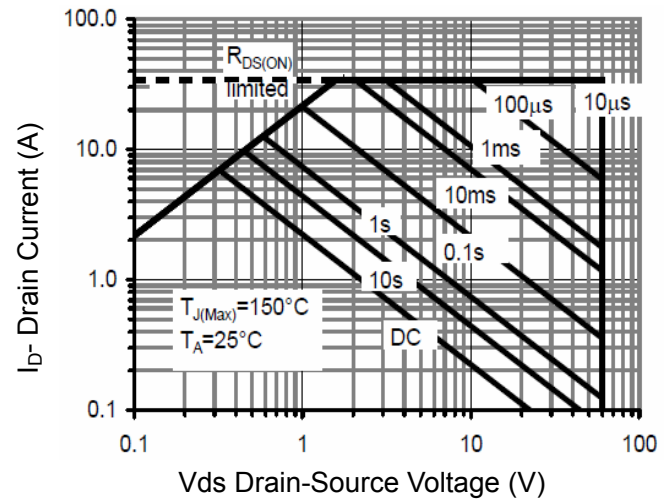


Figure 8 Safe Operation Area

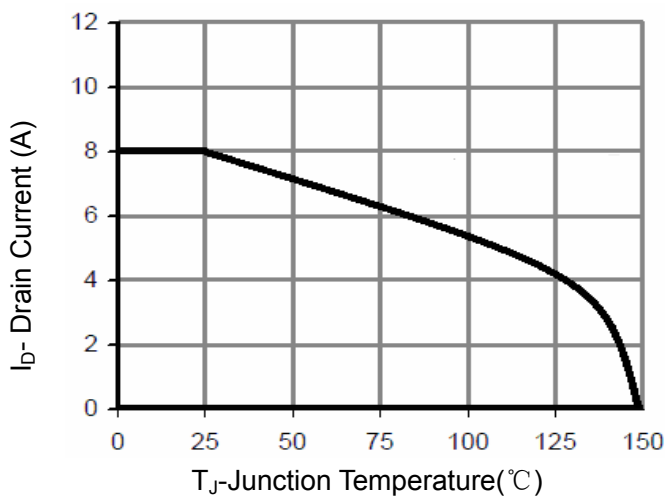


Figure 9 Current De-rating

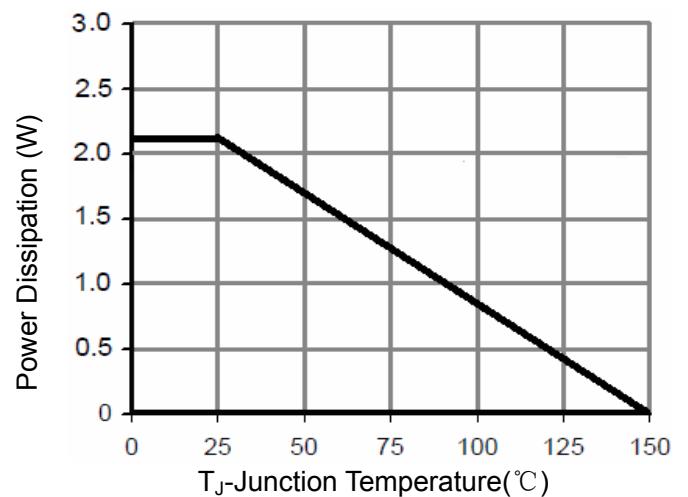


Figure 10 Power De-rating

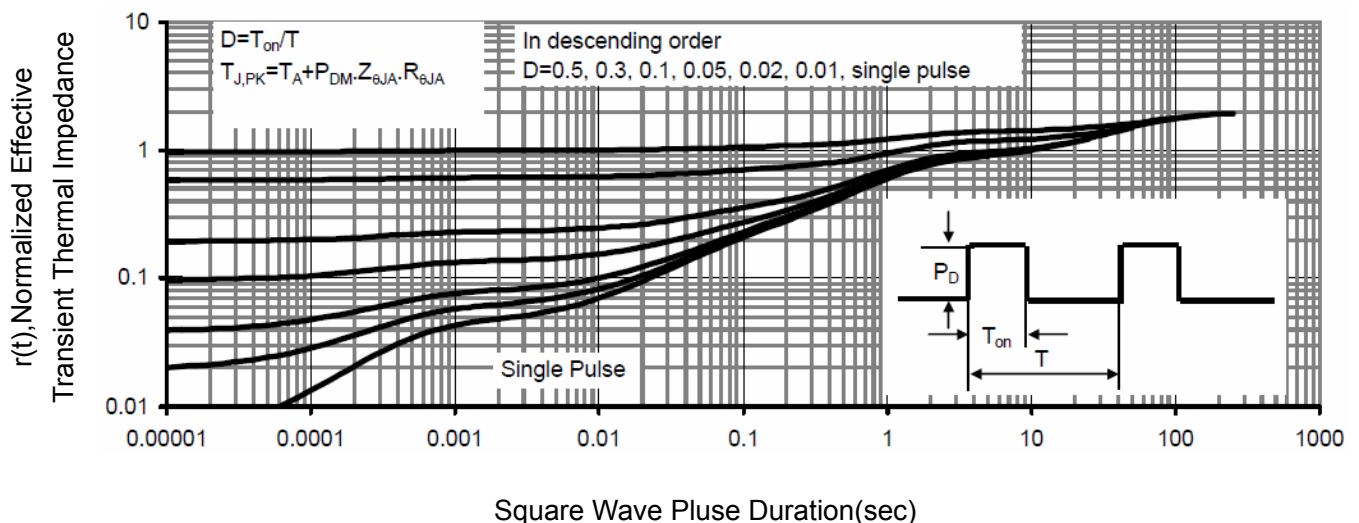
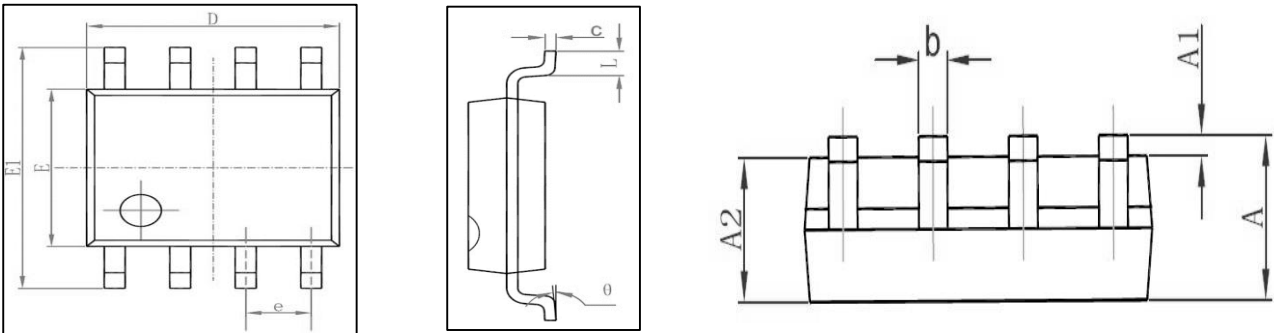
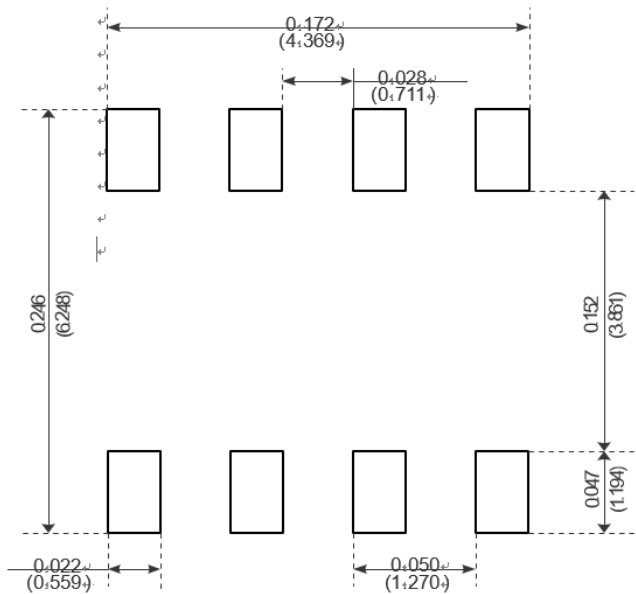


Figure 11 Normalized Maximum Transient Thermal Impedance

Package Mechanical Data:SOP-8L



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.006	0.010
D	4.700	5.100	0.185	0.200
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
e	1.270 (BSC)		0.050 (BSC)	
L	0.400	1.270	0.016	0.050
theta	0°	8°	0°	8°



Recommended Minimum Pads