



T2MNP7P5



150V N-Channel MOSFETs

General Description

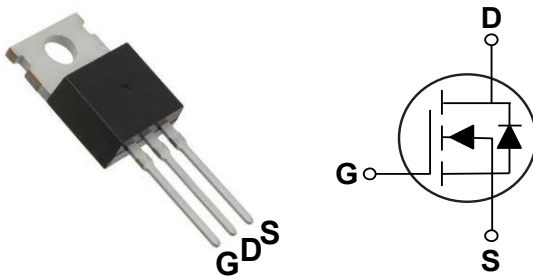
These N-Channel enhancement mode power field effect transistors are using SGT MOSFET technology. This advanced technology has been especially tailored to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode. These devices are well suited for high efficiency fast switching applications.

BV_{DSS}	$R_{DS(ON)}$	I_D
150 V	7.5 m Ω	154 A

Features

- $R_{DS(ON)} \leq 7.5m\Omega @ V_{GS}=10V$
- Fast Switching
- Green Device Available

TO-220 Pin Configuration



Applications

- DC/DC Converter
- LED Backlighting

Absolute Maximum Ratings $T_C=25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	150	V
V_{GS}	Gate-Source Voltage	± 20	V
I_D	Drain Current – Continuous ($T_C=25^\circ\text{C}$)	154	A
I_{DM}	Drain Current – Pulsed (NOTE 1)	445	A
EAS	Single Pulse Avalanche Energy (NOTE 2)	506	mJ
P_D	Power Dissipation ($T_C=25^\circ\text{C}$)	178.6	W
T_J	Operating Junction Temperature Range	-55 to 175	$^\circ\text{C}$
T_{STG}	Storage Temperature Range	-55 to 175	$^\circ\text{C}$
Marking Code		NP7P5	

Thermal Characteristics

Symbol	Parameter	Rating	Unit
$R_{\theta JA}$	Thermal Resistance Junction to Ambient	60	$^\circ\text{C/W}$
$R_{\theta JC}$	Thermal Resistance Junction to Case	0.84	$^\circ\text{C/W}$

**Electrical Characteristics (T_J=25°C, unless otherwise noted)****Off Characteristics**

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250uA	150	---	---	V
I _{DSS}	Drain-Source Leakage Current	V _{DS} =100V, V _{GS} =0V	---	---	1	uA
I _{GSS}	Gate-Source Leakage Current	V _{GS} =±20V, V _{DS} =0V	---	---	±100	nA

On Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
R _{DS(ON)}	Static Drain-Source On-Resistance	V _{GS} =10V, I _D =20A	---	---	7.5	mΩ
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =250uA	2.0	---	4.0	V

Dynamic and switching Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
Q _g	Total Gate Charge	V _{DS} =50V, V _{GS} =10V, I _D =20A	---	18	---	nC
Q _{gs}	Gate-Source Charge		---	10	---	
Q _{gd}	Gate-Drain Charge		---	72	---	
T _{d(on)}	Turn-On Delay Time	V _{DS} =50V, R _G =3Ω, I _D =20A, V _{GS} =10V	---	22	---	nS
T _r	Rise Time		---	115	---	
T _{d(off)}	Turn-Off Delay Time		---	44	---	
T _f	Fall Time		---	105	---	
C _{iss}	Input Capacitance	V _{DS} =50V, V _{GS} =0V, F=1MHz	---	5240	---	pF
C _{oss}	Output Capacitance		---	412	---	
C _{rss}	Reverse Transfer Capacitance		---	10	---	
R _g	Gate Resistance	V _{DS} =0V, V _{GS} =0V, F=1MHz	---	1.7	---	Ω

Drain-Source Diode Characteristics and Ratings

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I _S	Continuous Body Diode Current	V _G =V _D =0V, Force Current	---	---	154	A
V _{SD}	Diode Forward Voltage	V _{GS} =0V, I _S =20A	---	---	1.2	V
t _{rr}	Reverse Recovery Time	I _F =20A, dI _F /dt=100A/us	---	45	---	nS
Q _{rr}	Reverse Recovery Charge		---	12	---	nC

NOTES :

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. The EAS data shows Max. rating .The test condition is V_{DD}=50V, L=0.5mH, I_{AS}=45A, V_{GS}=10V.
3. The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2%.
4. The data is theoretically the same as I_D and I_{DM} , in real applications, should be limited by total power dissipation.



Characteristics Curves

FIG. 1- I_D vs. T_C

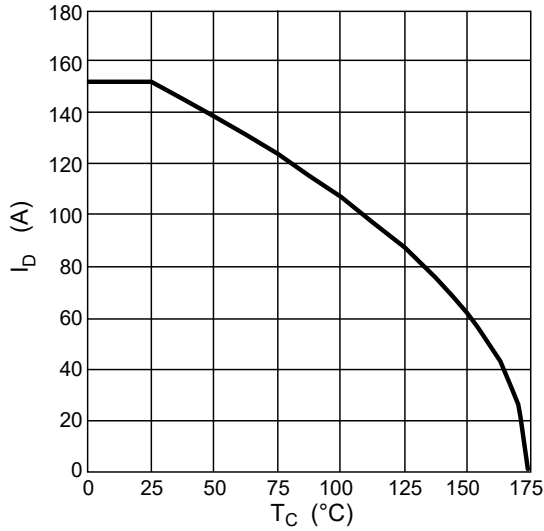


FIG. 3- $R_{DS(ON)}$ vs. V_{GS}

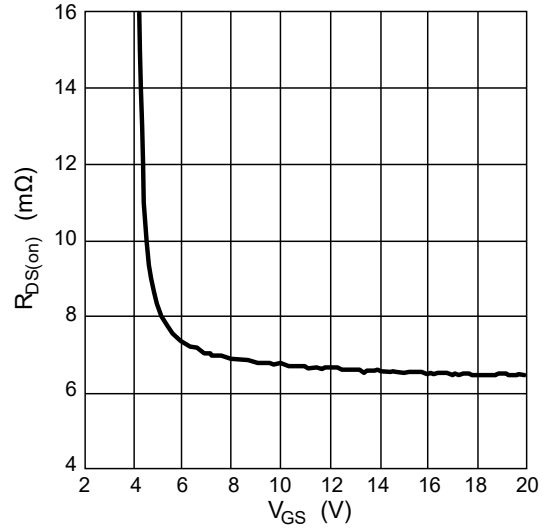


FIG. 3- $R_{DS(ON)}$ vs. T_J

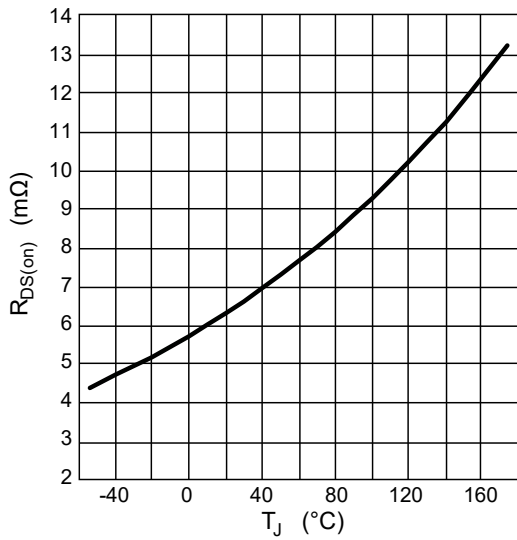


FIG. 4- Transfer Characteristics

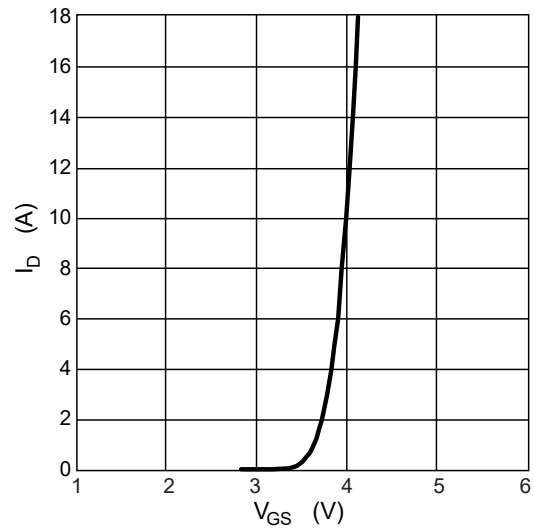


FIG. 5- Drain-Source Diode Forward

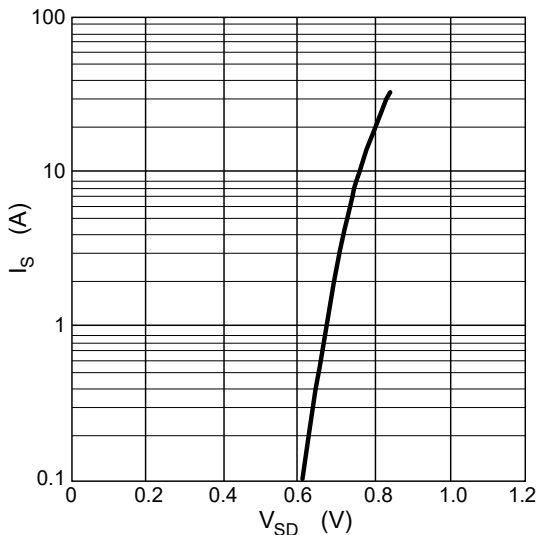
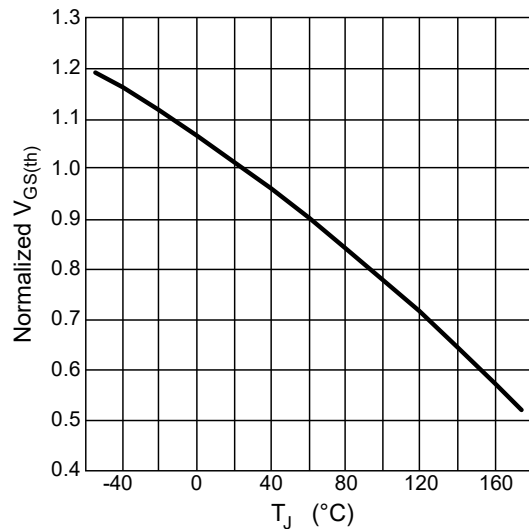


FIG. 6- Normalized $V_{GS(th)}$ vs. T_J





Characteristics Curves

FIG. 7- Switching Time Waveform

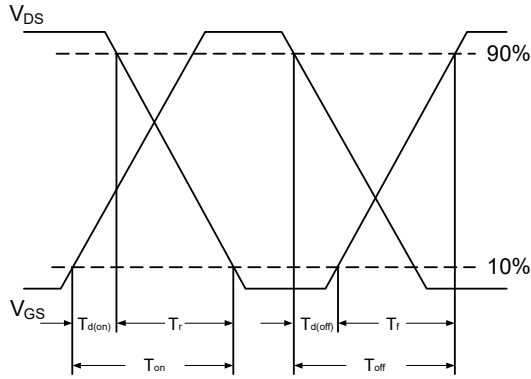
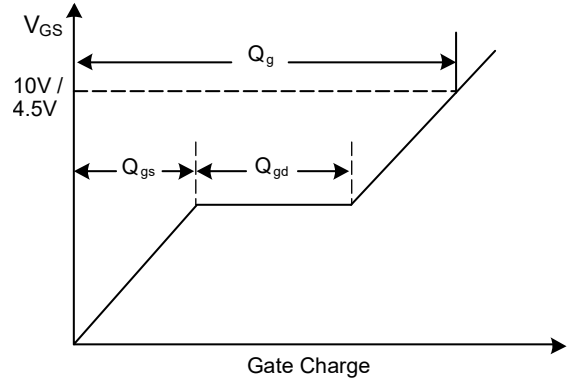
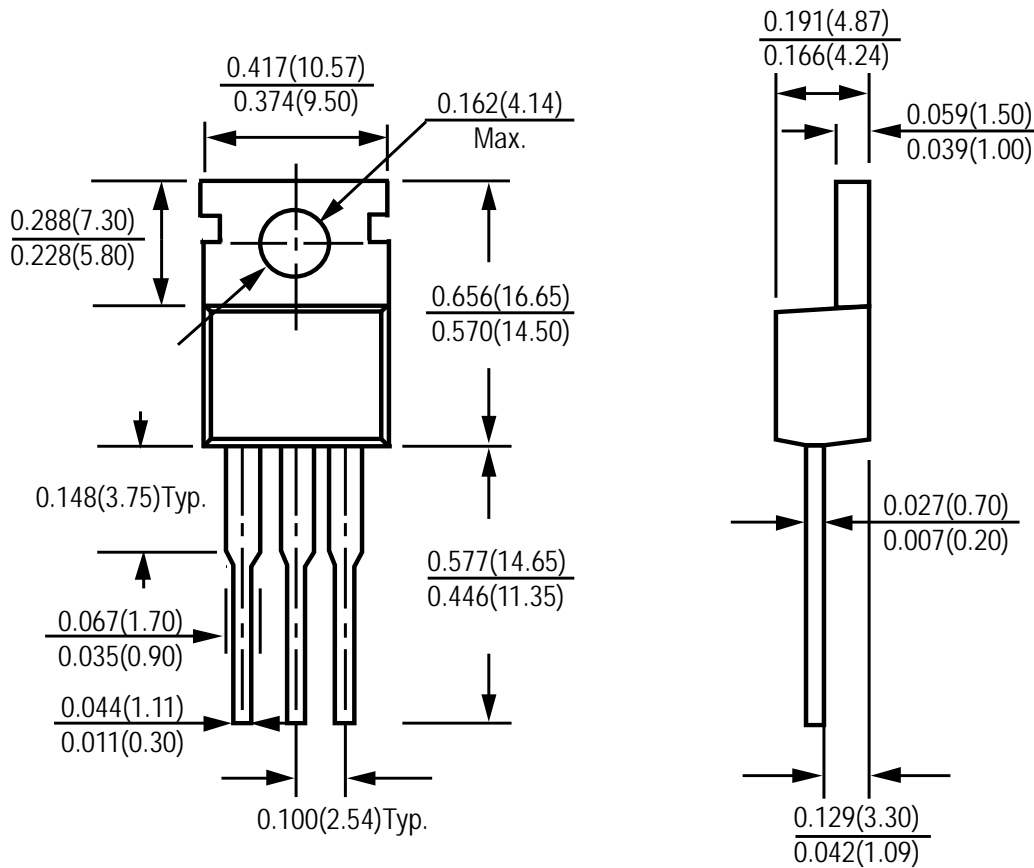


FIG. 8- Gate Charge Waveform



Package Outline Dimensions



TO-220

Dimensions in inches and (millimeters)



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