TNMPB460

20V P-Channel MOSFETs

General Description

These P-Channel enhancement mode power field effect transistors are using trench DMOS 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
-20 V	460 mΩ	-0.64 A

Features

- $R_{DS(ON)} \leqq 460m\Omega @V_{GS} = -4.5V$
- Fast Switching
- Green Device Available
- ESD Protection

SOT-23 Pin Configuration
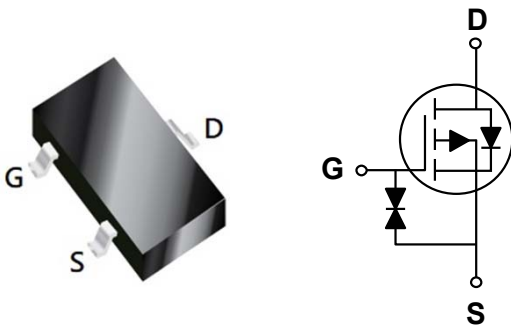
Applications

- Small Signal Switch
- Load Switch

Absolute Maximum Ratings $T_J=25^oC$ unless otherwise noted

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	-20	V
V_{GS}	Gate-Source Voltage	±12	V
I_D	Drain Current - Continuous ($T_A=25^oC$)	-0.64	A
I_{DM}	Drain Current - Pulsed ($T_A=25^oC$) (NOTE 1)	-1.5	A
P_D	Power Dissipation ($T_A=25^oC$)	0.35	W
T_J	Operating Junction Temperature Range	-55 to 150	^oC
T_{STG}	Storage Temperature Range	-55 to 150	^oC
Marking Code		11	

Thermal Characteristics

Symbol	Parameter	Rating	Unit
$R_{\theta JA}$	Thermal Resistance Junction to Ambient	350	$^oC/W$

20V P-Channel MOSFETs

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	-20	---	---	V
I_{DSS}	Drain-Source Leakage Current	V_{DS}= -16V , V_{GS}= 0V	---	---	-1	uA
I_{GSS}	Gate-Source Leakage Current	V_{GS}= ±12V , V_{DS}= 0V	---	---	±10	uA

On Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$R_{DS(ON)}$	Static Drain-Source On-Resistance	V_{GS}= -4.5V , I_D= -0.55A	---	---	460	mΩ
		V_{GS}= -2.5V , I_D= -0.45A	---	---	865	
		V_{GS}= -1.8V , I_D= -0.35A	---	---	1556	
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D= -250uA	-0.5	---	-1	V
gfs	Forward Transconductance	V_{DS}= -5V , I_S= -0.55A	---	1	---	S

Dynamic and switching Characteristics (NOTE 3)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
Q_g	Total Gate Charge	V_{DS}= -10V , V_{GS}= -4.5V , I_D= -0.55A	---	1	---	nC
Q_{gs}	Gate-Source Charge		---	0.17	---	
Q_{gd}	Gate-Drain Charge		---	0.18	---	
$T_{d(on)}$	Turn-On Delay Time	V_{DS}= -10V , V_{GS}= -4.5V , R_{GEN}= 3Ω , I_D= -1A	---	0.4	---	nS
T_r	Rise Time		---	0.03	---	
$T_{d(off)}$	Turn-Off Delay Time		---	0.04	---	
T_f	Fall Time		---	1.1	---	
C_{iss}	Input Capacitance	V_{DS}= -10V , V_{GS}= 0V , F= 1MHz	---	58	---	pF
C_{oss}	Output Capacitance		---	5.7	---	
C_{rss}	Reverse Transfer Capacitance		---	4.4	---	

Drain-Source Diode Characteristics and Ratings

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
V_{SD}	Diode Forward Voltage	V_{GS}= 0V , I_S= -0.55A	---	---	-1.1	V

NOTES :

1. Max. current is limited by junction temperature.

2. The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%.

3. Guaranteed by design, not subject to production testing.

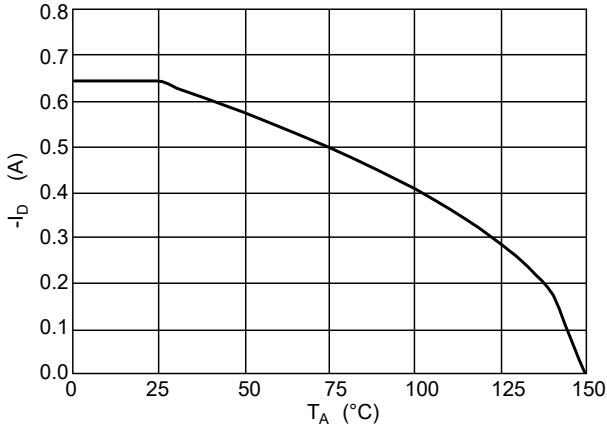## Characteristics Curves
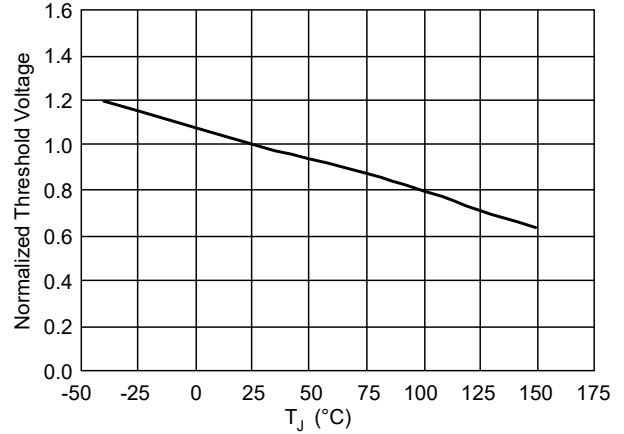
FIG. 1-Drain Current

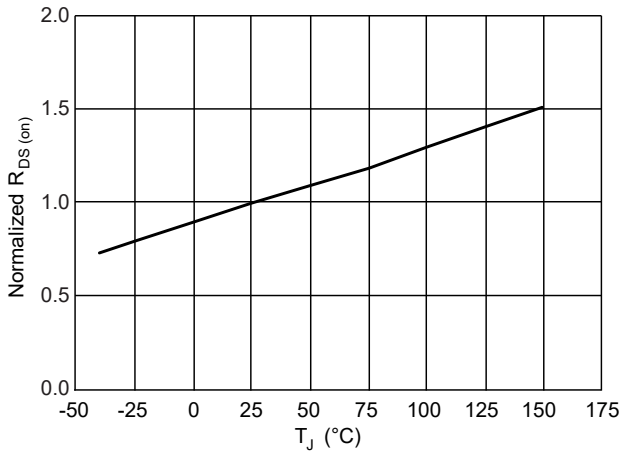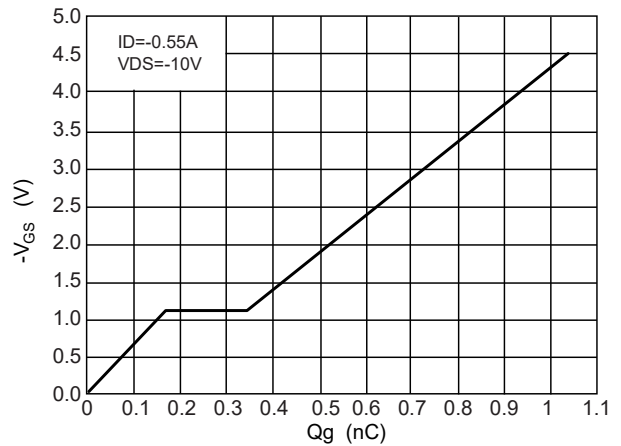FIG. 2-Gate Threshold Voltage

FIG. 3-Drain-Source On-Resistance

FIG. 4-Gate Charge Characteristics

FIG. 5-$R_{\theta JA}$ Transient Thermal Impedance

FIG. 6-Safe Operating Area
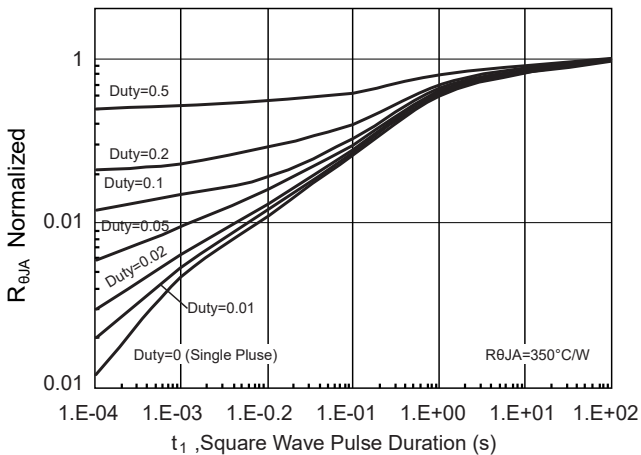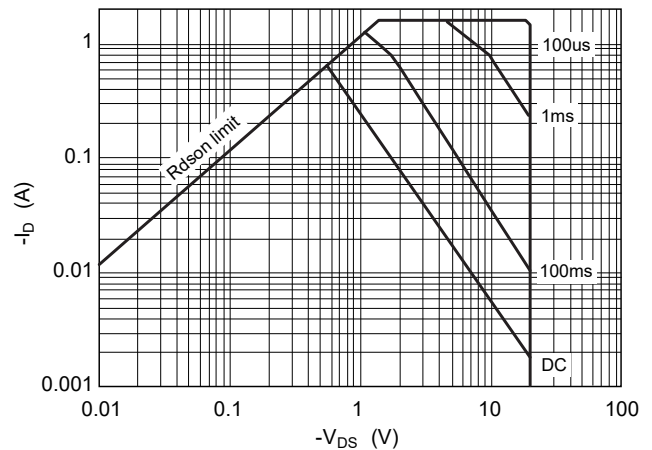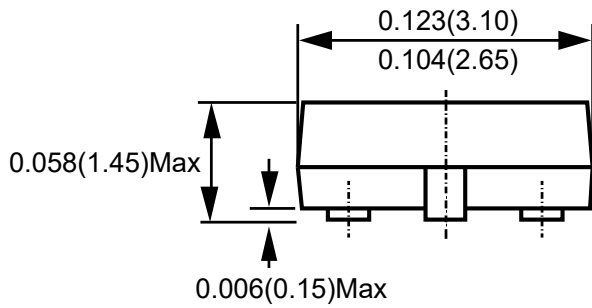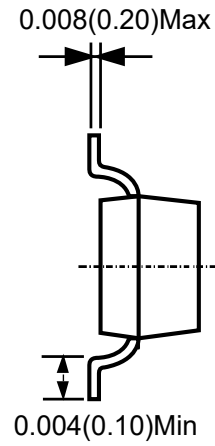
Package Outline Dimensions

0.091(2.30)
0.066(1.70)

0.119(3.00)
0.082(2.10)

0.069(1.75)
0.043(1.10)

0.022(0.55)Max

0.008(0.20)Max

0.004(0.10)Min

0.123(3.10)
0.104(2.65)

0.058(1.45)Max

0.006(0.15)Max
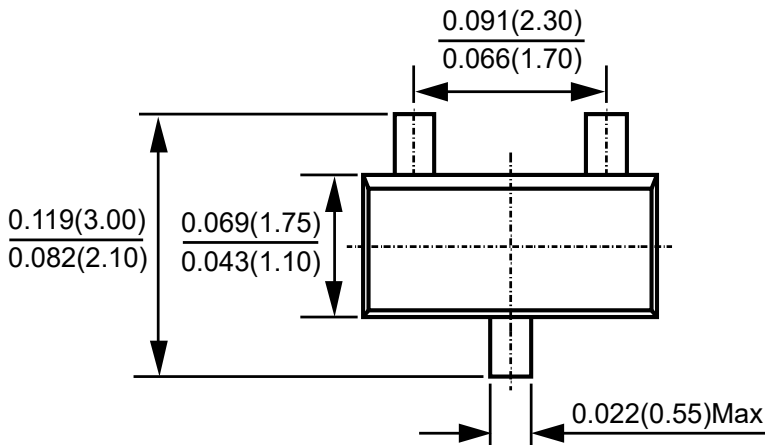
SOT-23

Dimensions in inches and (millimeters)

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