



D1MPM095



100V P-Channel MOSFETs

General Description

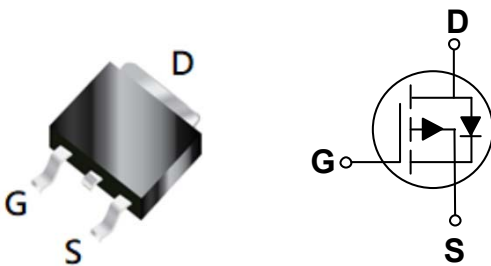
These P-Channel enhancement mode power field effect transistors are using trench DMOS technology. This advanced technology has been especially tailored to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode. These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

BV_{DSS}	$R_{DS(ON)}$	I_D
-100 V	95 m Ω	-30 A

Features

- $R_{DS(ON)} \leq 95m\Omega @ V_{GS} = -10V$
- Fast Switching
- Green Device Available
- Improved dv/dt Capability

TO-252 Pin Configuration



Applications

- Brushless Motor
- Uninterruptible Power Supply
- Load Switch

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

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	-100	V
V_{GS}	Gate-Source Voltage	± 20	V
I_D	Drain Current - Continuous ($T_c=25^\circ\text{C}$)	-30	A
I_{DM}	Drain Current - Pulsed (NOTE 1)	-90	A
EAS	Single Pulse Avalanche Energy (NOTE 2)	18	mJ
IAS	Single Pulse Avalanche Current (NOTE 2)	-19	A
P_D	Power Dissipation ($T_c=25^\circ\text{C}$)	54.3	W
T_J	Operating Junction Temperature Range	-55 to 150	$^\circ\text{C}$
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ\text{C}$
Marking Code		PM095	

Thermal Characteristics

Symbol	Parameter	Rating	Unit
$R_{\theta JA}$	Thermal Resistance Junction to Ambient	62.5	$^\circ\text{C/W}$
$R_{\theta JC}$	Thermal Resistance Junction to Case	2.3	$^\circ\text{C/W}$



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	-100	---	---	V
I _{DSS}	Drain-Source Leakage Current	V _{DS} = -100V , V _{GS} = 0V	---	---	-50	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 = -10A	---	---	95	mΩ
		V _{GS} = -4.5V , I _D = -8A	---	---	110	
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D = -250uA	-1.2	---	-2.5	V
g _{fs}	Forward Transconductance	V _{DS} = -10V , I _D = -10A	---	24	---	S

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	---	44.5	---	nC
Q _{gs}	Gate-Source Charge		---	9.13	---	
Q _{gd}	Gate-Drain Charge		---	5.93	---	
T _{d(on)}	Turn-On Delay Time	V _{DD} = -50V , V _{GS} = -10V , R _G = 3.3Ω , I _D = -10A	---	12	---	nS
T _r	Rise Time		---	27.4	---	
T _{d(off)}	Turn-Off Delay Time		---	79	---	
T _f	Fall Time		---	53.6	---	
C _{iss}	Input Capacitance	V _{DS} = -20V , V _{GS} = 0V , F= 1MHz	---	3029	---	pF
C _{OSS}	Output Capacitance		---	129	---	
C _{rSS}	Reverse Transfer Capacitance		---	76	---	

Drain-Source Diode Characteristics and Ratings

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I _S	Continuous Source Current	V _G = V _D = 0V , Force Current	---	---	-30	A
V _{SD}	Diode Forward Voltage	V _{GS} = 0V , I _S = -1A	---	---	-1.2	V
t _{rr}	Reverse Recovery Time	I _F = -8A , di/dt=-100A/us	---	38.7	---	nS
Q _{rr}	Reverse Recovery Charge		---	22.4	---	nC

NOTES :

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. V_{DD}=-72V, V_{GS}=-10V, L=0.1mH, I_{AS}=-19A.
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-Output Characteristics

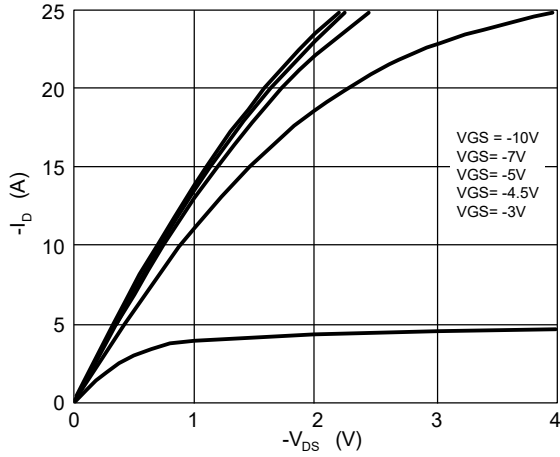


FIG. 2- $R_{DS(ON)}$ vs V_{GS}

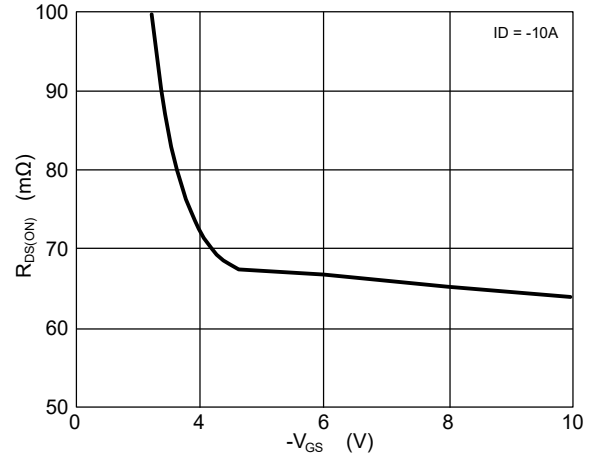


FIG. 3- I_S vs V_{SD}

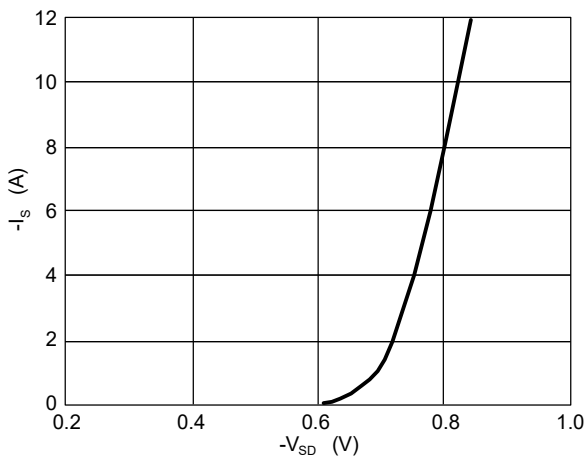


FIG. 4-Gate Charge Characteristics

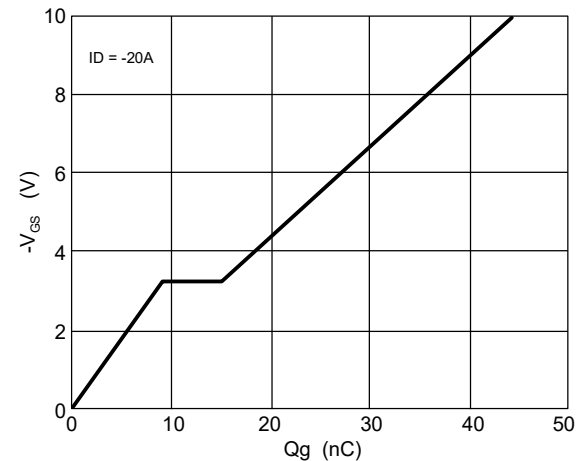


FIG. 5-Normalized $V_{GS(th)}$ vs T_J

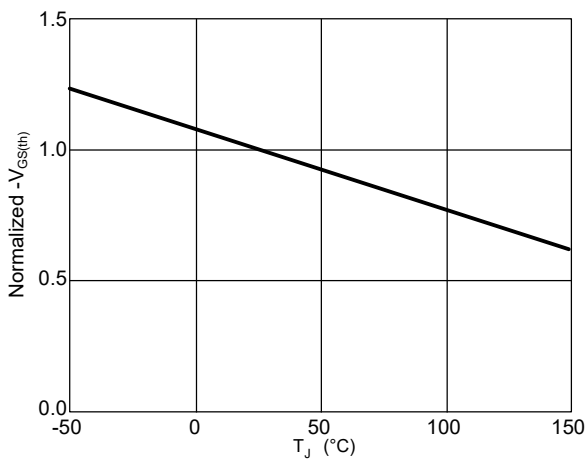
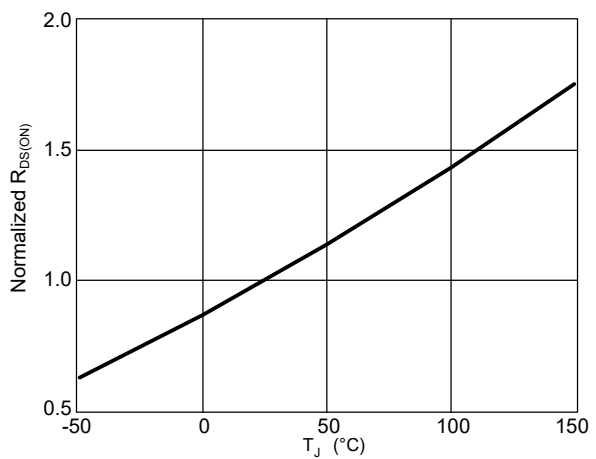


FIG. 6-Normalized $R_{DS(ON)}$ vs T_J





Characteristics Curves

FIG. 7-Switching Time Waveform

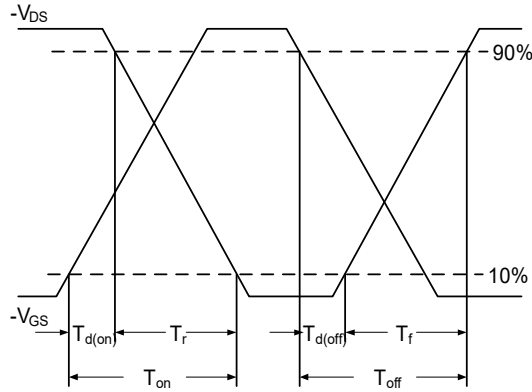
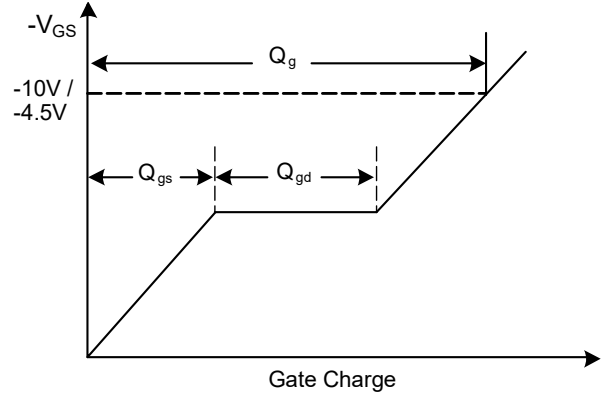
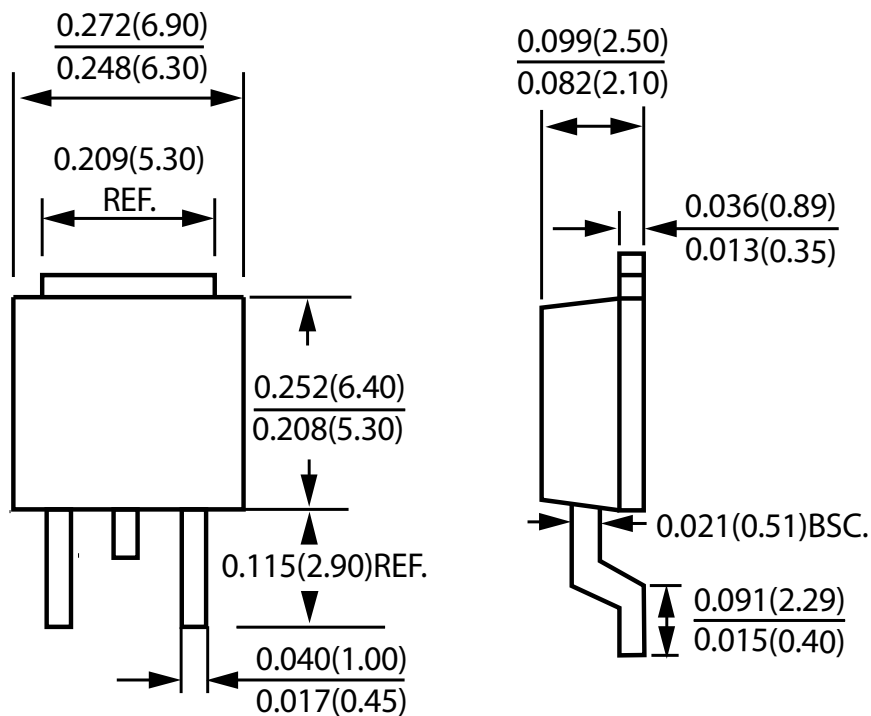


FIG. 8-Gate Charge Waveform



Package Outline Dimensions



TO-252

Dimensions in inches and (millimeters)



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