D7MBD032

40V N+P Dual Channel MOSFETs

General Description

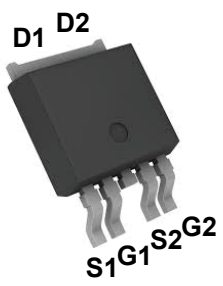
These N+P dual Channel enhancement mode power field effect transistors are using trench DMOS technology. This advanced technology has been especially tailored to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode.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

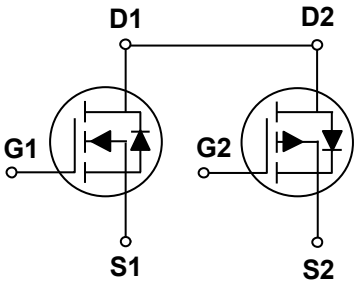
BV_{DSS}	$R_{DS(ON)}$	I_D
40 V	32 mΩ	15 A
-40 V	40 mΩ	-12 A

Features

- Fast switching
- Suit for 4.5V Gate Drive Applications

TO-252-4L Pin Configuration





Applications

- Networking
- Motor Drive Applications
- DC FAN
- Half / Full Bridge Topology

Absolute Maximum Ratings T_C=25°C unless otherwise noted

Symbol	Parameter	Rating		Units
V_{DS}	Drain-Source Voltage	40	-40	V
V_{GS}	Gate-Source Voltage	±20	±20	V
I_D	Drain Current - Continuous (T_C=25°C)	15	-12	A
	Drain Current - Continuous (T_C=100°C)	9	-7	A
I_{DM}	Drain Current - Pulsed	60	-48	A
P_D	Power Dissipation (T_C=25°C)	20		W
	Power Dissipation - Derate above 25°C	0.16		W/°C
T_J	Operating Junction Temperature Range	-55 to 150		°C
T_{STG}	Storage Temperature Range	-55 to 150		°C
Marking Code		DD4701		

Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction to Ambient	---	62	°C/W
$R_{\theta JC}$	Thermal Resistance Junction to Case	---	6	°C/W

N Channel 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	40	---	---	V
I_{DSS}	Drain-Source Leakage Current	V_{DS}=40V , V_{GS}=0V , T_J=25°C	---	---	1	uA
		V_{DS}=32V , V_{GS}=0V , T_J=125°C	---	---	10	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=6A	---	---	32	mΩ
		V_{GS}=4.5V , I_D=4A	---	---	42	
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D=250uA	1.2	1.6	2.5	V
gfs	Forward Transconductance	V_{DS}=10V , I_D=3A	---	6.5	---	S

Dynamic and switching Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
Q_g	Total Gate Charge	V_{DS}=20V , V_{GS}=4.5V , I_D=6A	---	5.2	---	nC
Q_{gs}	Gate-Source Charge		---	1.2	---	
Q_{gd}	Gate-Drain Charge		---	2.5	---	
$T_{d(on)}$	Turn-On Delay Time	V_{DD}=20V , V_{GS}=4.5V , R_G=25Ω , I_D=1A	---	3.2	---	nS
T_r	Rise Time		---	8.6	---	
$T_{d(off)}$	Turn-Off Delay Time		---	18	---	
T_f	Fall Time		---	6	---	
C_{iss}	Input Capacitance	V_{DS}=15V , V_{GS}=0V , F=1MHz	---	420	---	pF
C_{oss}	Output Capacitance		---	65	---	
C_{rss}	Reverse Transfer Capacitance		---	40	---	

Drain-Source Diode Characteristics and Ratings

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
V_{SD}	Diode Forward Voltage	V_{GS}=0V , I_S=1A	---	---	1	V

Characteristics Curves

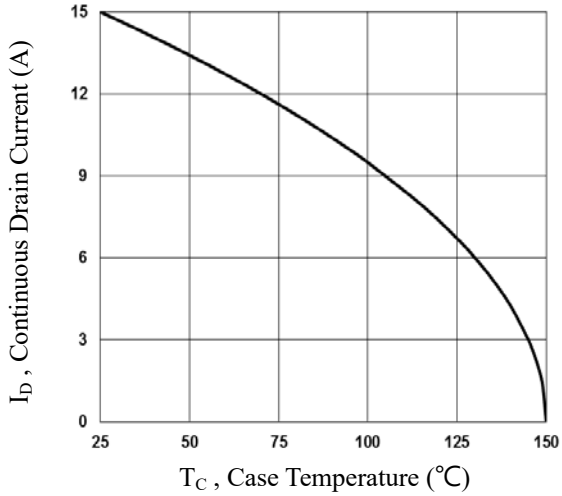


Fig.1 Continuous Drain Current vs. T_C

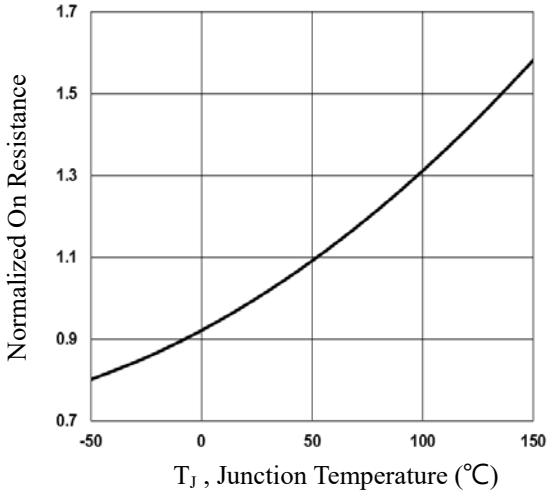


Fig.2 Normalized RDSON vs. T_J

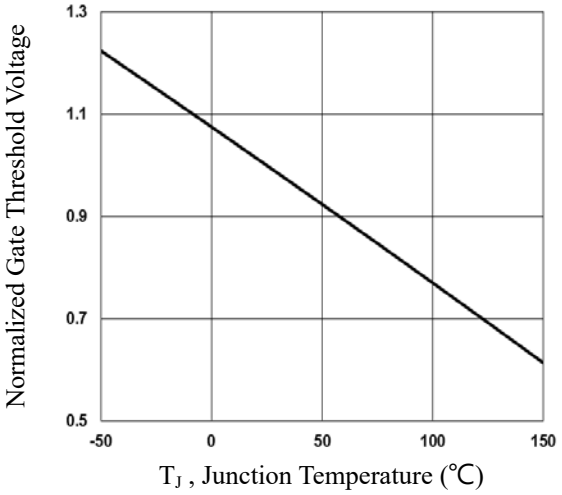


Fig.3 Normalized V_{th} vs. T_J

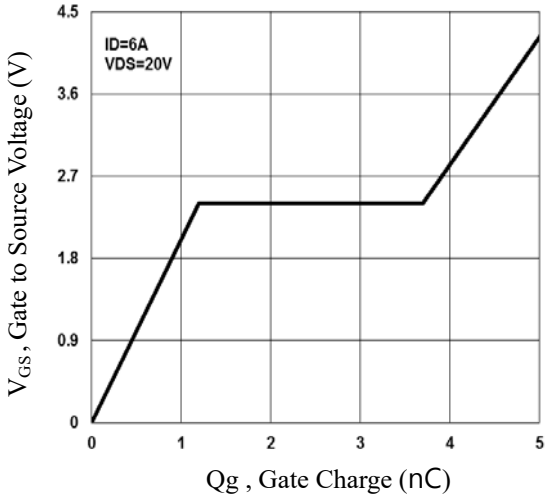


Fig.4 Gate Charge Waveform

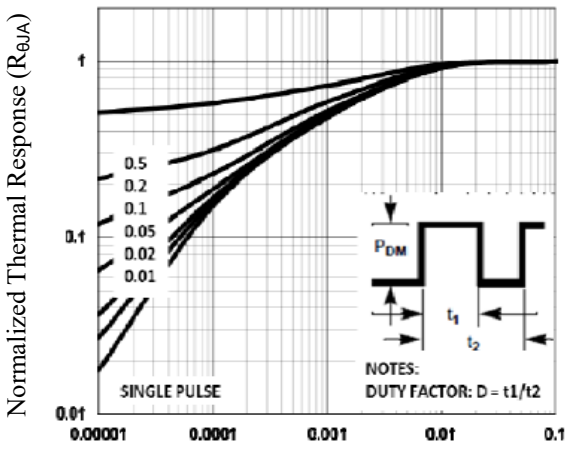


Fig.5 Normalized Transient Impedance

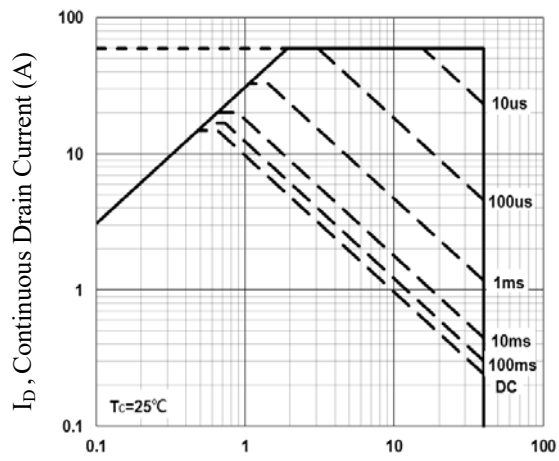


Fig.6 Maximum Safe Operation Area

P Channel 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	-40	---	---	V
I_{DSS}	Drain-Source Leakage Current	V_{DS}= -40V , V_{GS}= 0V , T_J=25°C	---	---	-1	uA
		V_{DS}= -32V , V_{GS}= 0V , T_J=125°C	---	---	-10	
I_{GSS}	Gate-Source Leakage Current	V_{GS}= ±10V , 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= -5A	---	---	40	mΩ
		V_{GS}= -4.5V , I_D= -3A	---	---	52	
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D= -250uA	-1.2	-1.6	-2.5	V
gfs	Forward Transconductance	V_{DS}= -10V , I_D= -3A	---	9	---	S

Dynamic and switching Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
Q_g	Total Gate Charge	V_{DS}= -20V , V_{GS}= -4.5V , I_D= -5A	---	9	---	nC
Q_{gs}	Gate-Source Charge		---	2.5	---	
Q_{gd}	Gate-Drain Charge		---	3.2	---	
$T_{d(on)}$	Turn-On Delay Time	V_{DD}= -20V , V_{GS}= -4.5V , R_G= 25Ω , I_D= -1A	---	20	---	nS
T_r	Rise Time		---	12	---	
$T_{d(off)}$	Turn-Off Delay Time		---	46	---	
T_f	Fall Time		---	6	---	
C_{iss}	Input Capacitance	V_{DS}= -15V , V_{GS}= 0V , F= 1MHz	---	1050	---	pF
C_{oss}	Output Capacitance		---	110	---	
C_{rss}	Reverse Transfer Capacitance		---	80	---	

Drain-Source Diode Characteristics and Ratings

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
V_{SD}	Diode Forward Voltage	V_{GS}=0V , I_S= -1A	---	---	-1	V

Characteristics Curves

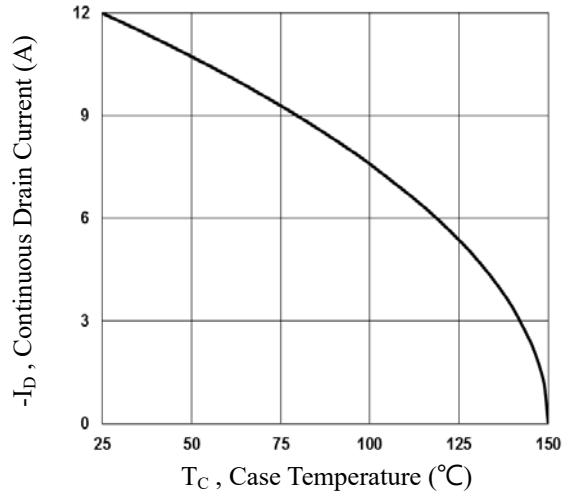


Fig.7 Continuous Drain Current vs. T_c

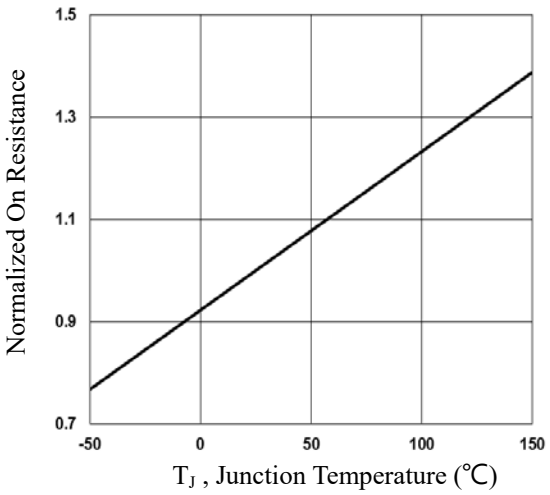


Fig.8 Normalized RDSON vs. T_J

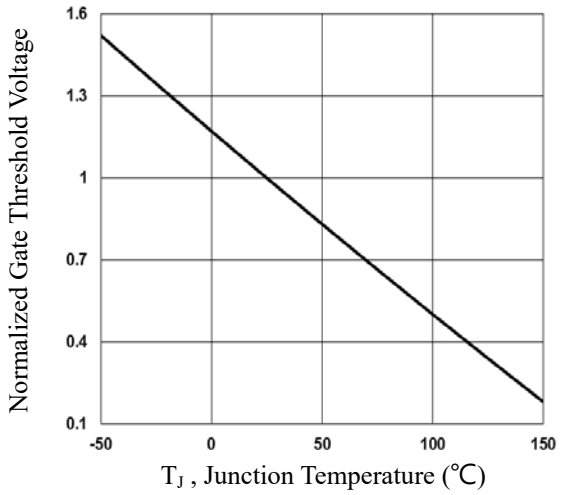


Fig.9 Normalized V_{th} vs. T_J

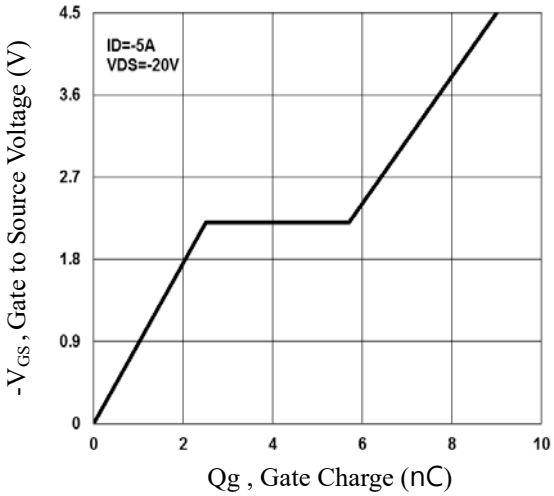


Fig.10 Gate Charge Waveform

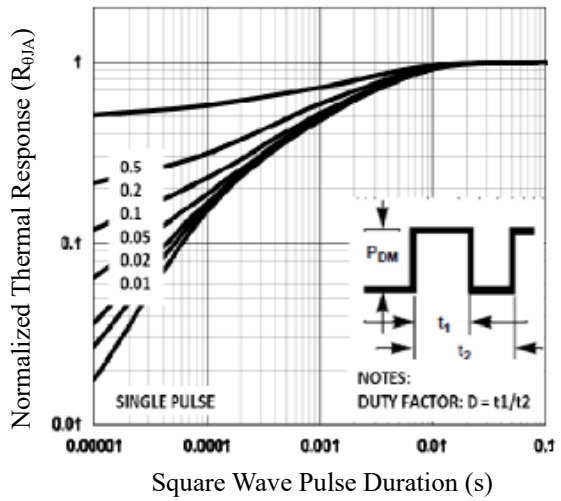


Fig.11 Normalized Transient Impedance

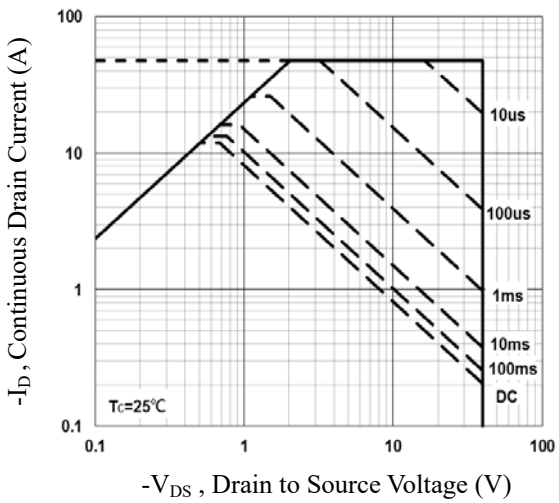
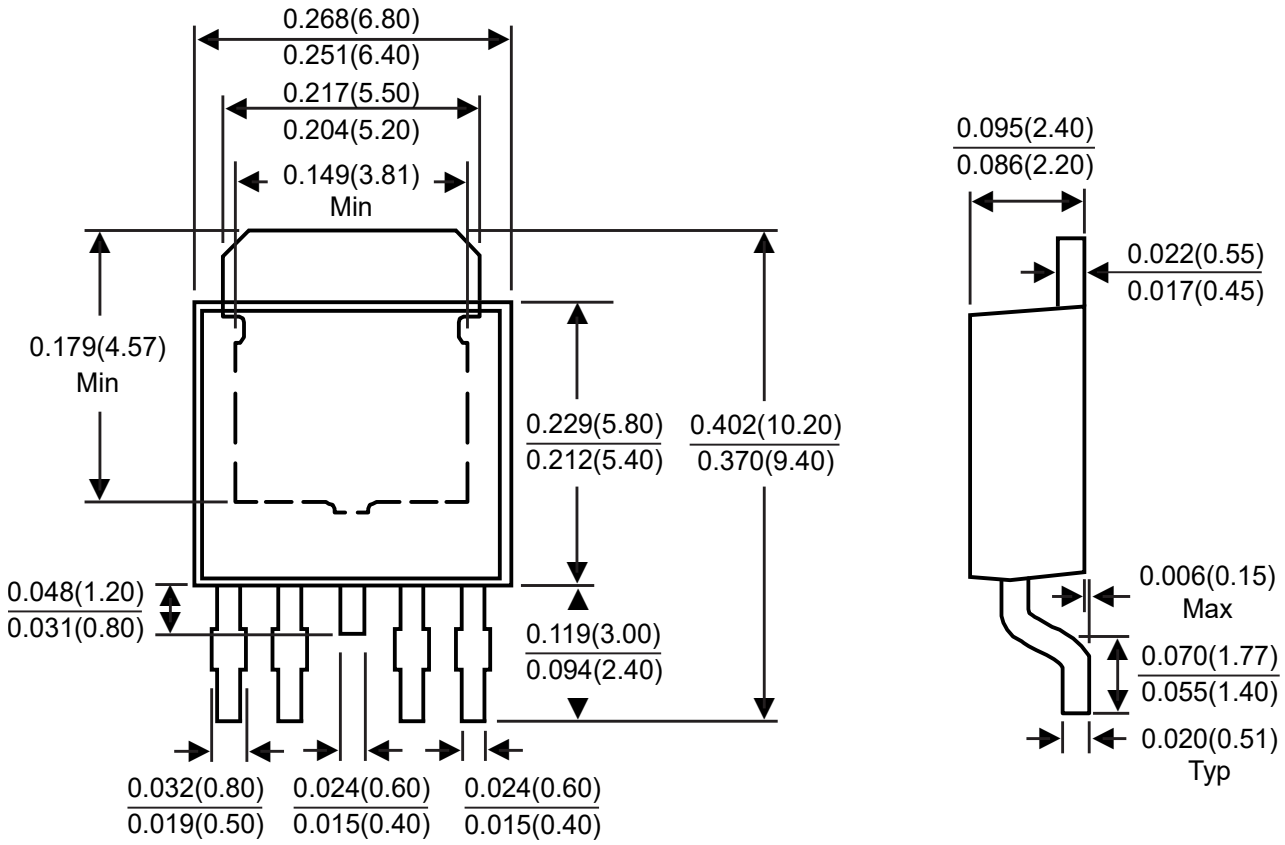


Fig.12 Maximum Safe Operation Area

Package Outline Dimensions



TO-252-4L

Dimensions in inches and (millimeters)

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