450V Depletion-Mode Power MOSFET

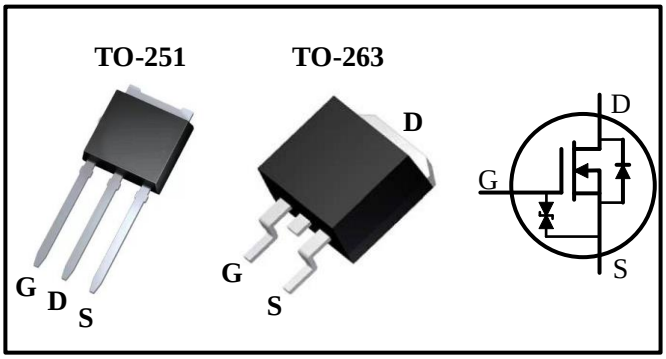
General Features

- Depletion Mode (Normally-on)
- Proprietary Advanced Planar Technology
- Rugged Polysilicon Gate Cell Structure
- RoHS Compliant
- Halogen-free Available

BV_{DSX}	$R_{DS(ON)(Max.)}$	I_D
450V	2Ω	3.75A

Applications

- Transient Protect
- Start-up
- Converters
- Normally-on Switches
- LED Drive Circuits
- Power Supplies
- Current Source
- Voltage Source



Ordering Information

Part Number	Package	Marking	Remark
DMU4523E	TO-251	4523E	Halogen Free
DMB4523E	TO-263	4523E	Halogen Free

Absolute Maximum Ratings

T_A=25℃ unless otherwise specified

Symbol	Parameter	DMU4523E	DMB4523E	Unit
V_{DSX}	Drain-to-Source Voltage [1]	450		V
V_{DGX}	Drain-to-Gate Voltage [1]	450		V
I_D	Continuous Drain Current	4.25	8.75	A
I_{DM}	Pulsed Drain Current [2]	17	26	
P_D	Power Dissipation	50	230	W
V_{GS}	Gate-to-Source Voltage	±20		V
V_{ESD}	Gate Source ESD [3]	3000		V
	Source to Gate ESD [3]	3000		V
T_L	Soldering Temperature Distance of 1.6mm from case for 10 seconds	300		℃
T_J & T_{STG}	Operating and Storage Temperature Range	-55 to 150		

Caution: Stresses greater than those listed in the "Absolute Maximum Ratings" may cause permanent damage to the device.

Thermal Characteristics

Symbol	Parameter	DMB4523E	DMU4523E	Unit
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	0.54	2.5	°C/W

Electrical Characteristics

OFF Characteristics

T_A=25°C unless otherwise specified

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions
BV_{DSX}	Drain-to-Source Breakdown Voltage	450	--	--	V	V_{GS}=-10V, I_D=250μA
$I_{D(OFF)}$	Drain-to-Source Leakage Current	--	--	1	μA	V_{DS}=400V, V_{GS}=-10V
I_{GSS}	Gate-to-Source Leakage Current	--	--	20	μA	V_{GS}=20V, V_{DS}=0V
		--	--	-20		V_{GS}=-20V, V_{DS}=0V

ON Characteristics

T_A=25°C unless otherwise specified

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions
$R_{DS(ON)}$	Static Drain-to-Source On-Resistance	--	--	2	Ω	V_{GS}=0V, I_D=1A [4]
$V_{GS(OFF)}$	Gate-to-Source Cut-off Voltage	-4.0	--	-1.7	V	V_{DS}=3V, I_D=8μA
gfs	Forward Transconductance	--	3100	--	mS	V_{DS}=20V, I_D=100mA

Dynamic Characteristics

Essentially independent of operating temperature

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions
C_{iss}	Input Capacitance	--	1.11	--	pF	V_{GS}=-7V V_{DS}=25V f=1.0MHz
C_{oss}	Output Capacitance	--	62.8	--		
C_{rss}	Reverse Transfer Capacitance	--	6.54	--		
Q_g	Total Gate Charge	--	158.8	--	nC	V_{GS}=-6V~0V V_{DS}=25V I_D=200mA
Q_{gs}	Gate-to-Source Charge	--	58.3	--		
Q_{gd}	Gate-to-Drain (Miller) Charge	--	55.6	--		

Resistive Switching Characteristics

Essentially independent of operating temperature

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions
$t_{d(on)}$	Turn-on Delay Time	--	5.7	--	ns	V_{GS}=-6V~0V V_{DD}=25V I_D=200mA R_G=10Ω
t_{rise}	Rise Time	--	18.5	--		
$t_{d(off)}$	Turn-off Delay Time	--	26.4	--		
t_{fall}	Fall Time	--	18.5	--		

Source-Drain Diode Characteristics

T_A=25℃ unless otherwise specified

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions
V_{SD}	Diode Forward Voltage	--	--	1.5	V	I_{SD}=200mA [4], V_{GS}=-10V

NOTE:

[1] T_J=+25℃ to +150℃.
[2] Repetitive rating, pulse width limited by maximum junction temperature.
[3] The test is based on JEDEC EIA/JESD22-A114(HBM).
[4] Pulse width≤380μs, duty cycle≤2%.

Published by
ARK Microelectronics Co., Ltd.
ADD: D26, UESTC National Science Park No. 1 Shuangxing Avenue, Chengdu, Sichuan.**All All Rights Reserved.**

Disclaimers

ARK Microelectronics Co., Ltd. reserves the right to make change without notice in order to improve reliability, function or design and to discontinue any product or service without notice. Customers should obtain the latest relevant information before orders and should verify that such information is current and complete. All products are sold subject to ARK Microelectronics Co., Ltd's terms and conditions supplied at the time of order acknowledgement.

ARK Microelectronics Co., Ltd. warrants performance of its hardware products to the specifications at the time of sale, Testing, reliability and quality control are used to the extent ARK Microelectronics Co., Ltd deems necessary to support this warrantee. Except where agreed upon by contractual agreement, testing of all parameters of each product is not necessary performed.

ARK Microelectronics Co., Ltd. does not assume any liability arising from the use of any product or circuit designs described herein. Customers are responsible for their products and applications using ARK Microelectronics Co., Ltd's components. To minimize risk, customers must provide adequate design and operating safeguards.

ARK Microelectronics Co., Ltd. does not warrant or convey any license either expressed or implied under its patent rights, nor the rights of others. Reproduction of information in ARK Microelectronics Co., Ltd's data sheets or data books is permissible only if reproduction is without modification or alteration. Reproduction of this information with any alteration is an unfair and deceptive business practice. ARK Microelectronics Co., Ltd is not responsible or liable for such altered documentation.

Resale of ARK Microelectronics Co., Ltd's products with statements different from or beyond the parameters stated by ARK Microelectronics Co., Ltd. for the product or service voids all express or implied warrantees for the associated ARK Microelectronics Co., Ltd's product or service and is unfair and deceptive business practice. ARK Microelectronics Co., Ltd is not responsible or liable for any such statements.

Life Support Policy:

ARK Microelectronics Co., Ltd's products are not authorized for use as critical components in life devices or systems without the expressed written approval of ARK Microelectronics Co., Ltd.

As used herein:

1. Life support devices or systems are devices or systems which:
   a. are intended for surgical implant into the human body,
   b. support or sustain life,
   c. whose failure to perform when properly used in accordance with instructions for used provided in the labeling, can be reasonably expected to result in significant injury to the user.
2. A critical component is any component is any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.