

ead-free Gree

DMC2700UDMQ

20V COMPLEMENTARY PAIR ENHANCEMENT MODE MOSFET

Product Summary

Device	BV _{DSS}	R ds(оn) max	lp max T _A = +25°C (Note 5)	
Q1	20V	0.4Ω @ V _{GS} = 4.5V	1.34A	
QI	200	20 V	0.5Ω @ V _{GS} = 2.5V	1.65A
Q2	-20V	0.7Ω @ V _{GS} = -4.5V	-1.14A	
QZ	-201	0.9Ω @ V _{GS} = -2.5V	-0.94A	

Description and Applications

This MOSFET has been designed to minimize the on-state resistance (RDs(ON)) yet maintain superior switching performance, making it ideal for high efficiency power management applications.

Portable electronics

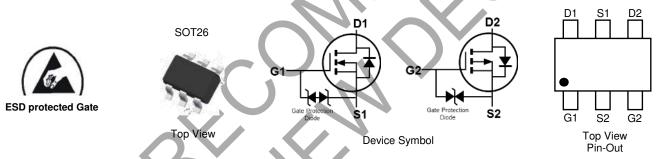
Features and Benefits

- Low On-Resistance
- Low Gate Threshold Voltage $V_{GS(TH)} < 1V$
- Low Input Capacitance
- Fast Switching Speed
- Low Input/Output Leakage
- Complementary Pair MOSFET
- Ultra-Small Surface Mount Package
- ESD Protected
- Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)
- Halogen and Antimony Free. "Green" Device (Note 3)
 The DIODES™ DMC2700UDMQ is suitable for automotive
- The DIODES[™] DMC2700UDMQ is suitable for automotive applications requiring specific change control; this part is AEC-Q101 qualified, PPAP capable, and manufactured in IATF 16949 certified facilities.

https://www.diodes.com/quality/product-definitions/

Mechanical Data

- Package: SOT26
- Package Material: Molded Plastic, "Green" Molding Compound.
 UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish Matte Tin Annealed over Copper Leadframe. Solderable per MIL-STD-202, Method 208 3
- Terminals Connections: See Diagram Below
- Weight: 0.015 grams (Approximate)



Ordering Information (Note 4)

Part Number	Package	Pack	king		
Part Number	Package	Qty.	Carrier		
DMC2700UDMQ-7	SOT26	3000	Tape & Reel		
Notes: 1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant. 2. See https://www.diodes.com/quality/lead-free/ for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.					

3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.

4. For packaging details, go to our website at https://www.diodes.com/design/support/packaging/diodes-packaging/.

Marking Information

C	27	ΥM	

C27 = Product Type Marking Code YM = Date Code Marking

Y = Year (ex: J = 2022)

M = Month (ex: 9 = September)

Date Code Key

Date Code Key												
Year	2017		2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Code	E		J	K	L	М	Ν	0	Р	R	S	Т
	1											
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec



Maximum Ratings N-CHANNEL - Q1 (@TA = +25°C, unless otherwise specified.)

Characteris	tic	Symbol	Value	Unit
Drain Source Voltage		VDSS	20	V
Gate-Source Voltage		Vgss	±6	V
Drain Current (Note 5)	$T_A = +25^{\circ}C$ $T_A = +85^{\circ}C$	lD	1.34 0.97	А

Maximum Ratings P-CHANNEL – Q₂ (@T_A = +25°C, unless otherwise specified.)

Characteris	tic	Symbol	Value	Unit
Drain Source Voltage		VDSS	-20	V
Gate-Source Voltage		VGSS	±6	V
Drain Current (Note 5)	TA = +25°C T _A = +85°C	ld	-1.14 -1.07	А

Thermal Characteristics (@TA = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 5)	PD	1.12	W
Thermal Resistance, Junction to Ambient (Note 5)	Reja	111	°C/W
Operating and Storage Temperature Range	Tj, Tstg	-55 to +150	°C

Note: 5. For a device mounted on 25mm X 25mm FR-4 PCB board with a high coverage of single sided 1oz copper, in still air conditions with two active die.



Electrical Characteristics N-CHANNEL – Q1 (@TA = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Тур	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 6)						
Drain-Source Breakdown Voltage	BVDSS	20	—	_	V	$V_{GS} = 0V, I_D = 250 \mu A$
Zero Gate Voltage Drain Current	I _{DSS}	_	—	1	μA	$V_{DS} = 20V, V_{GS} = 0V$
Gate-Source Leakage	lgss	_	—	±10	μΑ	$V_{GS} = \pm 4.5 V$, $V_{DS} = 0 V$
ON CHARACTERISTICS (Note 6)						
Gate Threshold Voltage	V _{GS(TH)}	0.5		1.0	V	$V_{DS} = V_{GS}$, $I_D = 250 \mu A$
		_	0.3	0.4		VGS = 4.5V, ID = 600mA
Static Drain-Source On-Resistance	R _{DS(ON)}	_	0.4	0.5	Ω	$V_{GS} = 2.5V, I_D = 500mA$
		_	0.5	0.7		VGS = 1.8V, ID = 350mA
Forward Transfer Admittance	Y _{fs}		1.4		S	V _{DS} = 10V, I _D = 400mA
Diode Forward Voltage (Note 6)	Vsd	_	0.7	1.2	V	Vgs = 0V, Is = 150mA
DYNAMIC CHARACTERISTICS						
Input Capacitance	Ciss		60.67		pF	
Output Capacitance	Coss	_	9.68		pF	VDS = 16V, VGS = 0V f = 1.0MHz
Reverse Transfer Capacitance	Crss	_	5.37	—	pF	
Total Gate Charge	Qg	_	736.6			
Gate-Source Charge	Qgs	_	93.6	ļ	pC	$V_{GS} = 4.5V, V_{DS} = 10V,$
Gate-Drain Charge	Q _{gd}	_	116.6	-		I _D = 250mA
Turn-On Delay Time	td(ON)	_	5.1			
Turn-On Rise Time	tR	\	7.4	_		$V_{DD} = 10V, V_{GS} = 4.5V,$
Turn-Off Delay Time	tD(OFF)	-	26.7		ns	$R_L = 47\Omega, R_G = 10\Omega,$ ID = 200mA
Turn-Off Fall Time	tF	4	12.3			ID = 20011A

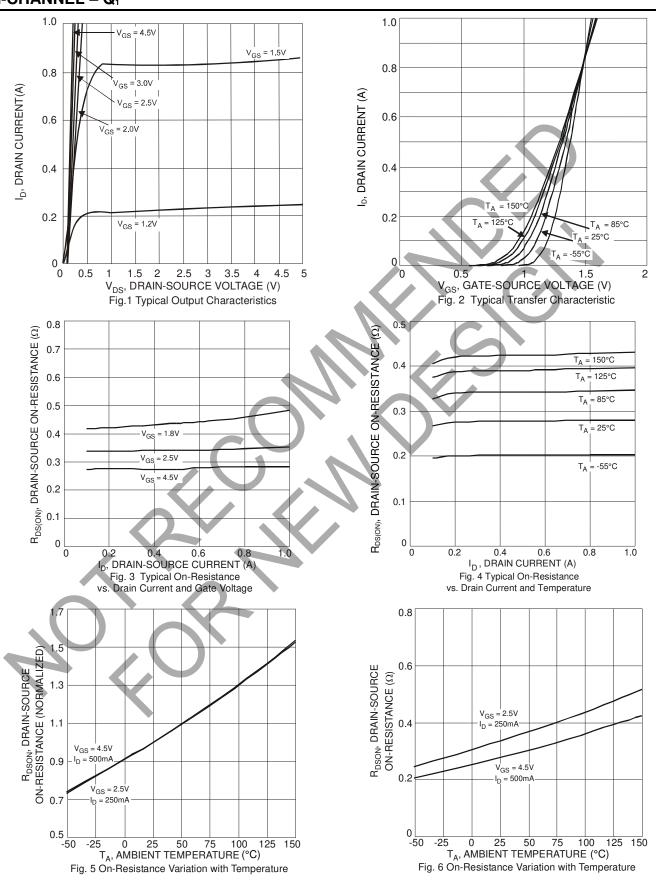
Electrical Characteristics P-CHANNEL – Q₂ (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Тур	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 6)			-			
Drain-Source Breakdown Voltage	BV _{DSS}	-20	—		V	$V_{GS} = 0V, I_D = -250 \mu A$
Zero Gate Voltage Drain Current	IDSS		_	-1	μΑ	$V_{DS} = -20V, V_{GS} = 0V$
Gate-Source Leakage	lgss		_	±10	μΑ	$V_{GS} = \pm 4.5 V, V_{DS} = 0 V$
ON CHARACTERISTICS (Note 6)						
Gate Threshold Voltage	VGS(TH)	-0.5		-1.0	V	$V_{DS} = V_{GS}$, $I_D = -250 \mu A$
			0.5	0.7		VGS = -4.5V, ID = -430mA
Static Drain-Source On-Resistance	RDS(ON)		0.7	0.9	Ω	VGS = -2.5V, ID = -300mA
			1.0	1.3		VGS = -1.8V, ID = -150mA
Forward Transfer Admittance	Y _{fs}		-0.9	_	S	$V_{DS} = -10V, I_D = -250mA$
Diode Forward Voltage (Note 6)	VSD		-0.8	-1.2	V	V _{GS} = 0V, I _S = -150mA
DYNAMIC CHARACTERISTICS						
Input Capacitance	Ciss	_	59.76	_	pF	
Output Capacitance	Coss		12.07	_	pF	V _{DS} = -16V, V _{GS} = 0V f = 1.0MHz
Reverse Transfer Capacitance	Crss	_	6.36	_	pF	
Total Gate Charge	Qg		622.4	_		
Gate-Source Charge	Qgs		100.3	_	рС	$V_{GS} = -4.5V, V_{DS} = -10V,$ $I_{D} = -250mA$
Gate-Drain Charge	Qgd	_	132.2	_		ID = -230IIIA
Turn-On Delay Time	t _{D(ON)}	_	5.1	_		
Turn-On Rise Time	tR		8.1			$V_{DD} = -10V, V_{GS} = -4.5V,$
Turn-Off Delay Time	tD(OFF)		28.4		ns	$R_L = 47\Omega, R_G = 10\Omega,$ $I_D = -200 \text{mA}$
Turn-Off Fall Time	tF		20.7			D = -200 mA

Note: 6. Short duration pulse test used to minimize self-heating effect.



N-CHANNEL – Q₁



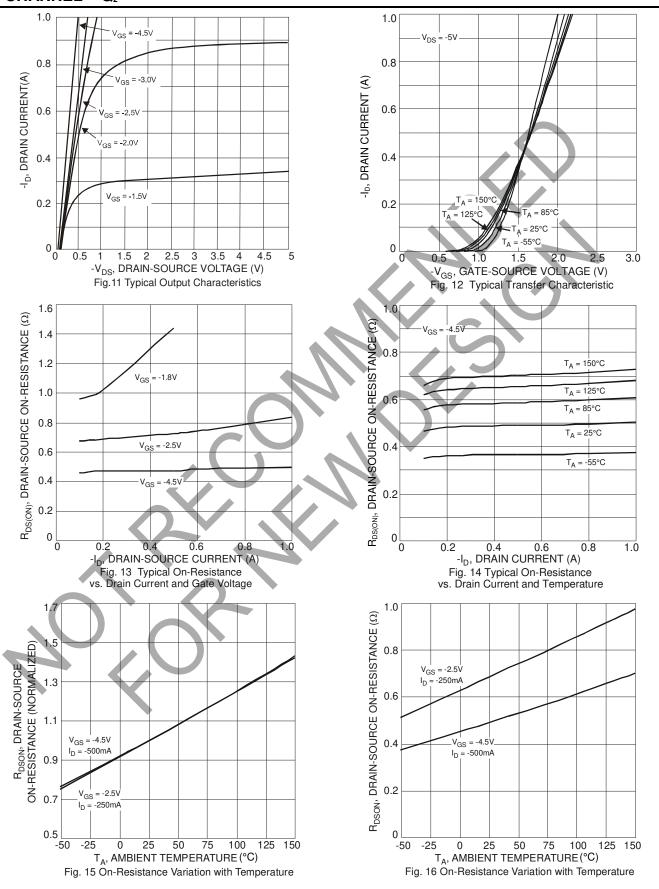


N-CHANNEL - Q1 (continued) 1.6 1.0 V_{GS(TH)}, GATE THRESHOLD VOLTAGE (V) 0.8 1.2 Is, SOURCE CURRENT (A) A = 25°C 0.6 0.8 $I_{D} = 1 \text{ mA}$ 0.4 _D = 250µA 0.4 0.2 0 0 0.4 0.6 0.8 1.0 V_{SD}, SOURCE-DRAIN VOLTAGE (V) Fig. 8 Diode Forward Voltage vs. Current 0.2 100 125 150 -50 25 50 75 -25 0 1.2 ${\rm T_A}, {\rm AMBIENT} \ {\rm TEMPERATURE} \ (^{\circ}{\rm C})$ Fig. 7 Gate Threshold Variation vs. Ambient Temperature 1,000 100 $T_A = 150^{\circ}C$ LEAKAGE CURRENT (nA) C, CAPACITANCE (pF) $T_A = 125^{\circ}C$ 100 10 Cos $T_A = 85^{\circ}C$ 10 DSS, $T_A = 25^{\circ}C$ 1 1 4 8 12 16 V_{DS}, DRAIN-SOURCE VOLTAGE (V) 5 10 15 V_{DS}, DRAIN-SOURCE VOLTAGE (V) 0 20 20 0 Fig. 9 Typical Total Capacitance Fig. 10 Typical Leakage Current vs. Drain-Source Voltage



P-CHANNEL – Q₂

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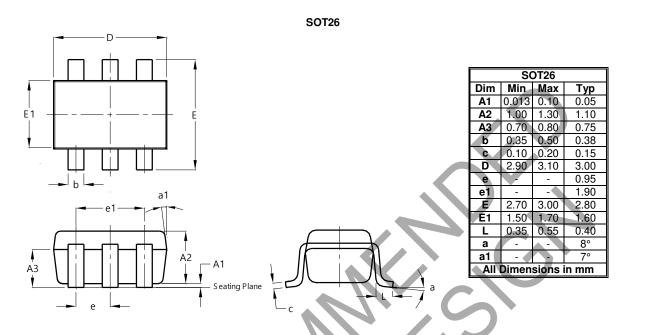


P-CHANNEL - Q₂ (continued) 1.6 1.0 -V_{GS(TH)}, GATE THRESHOLD VOLTAGE (V) 0.8 1.2 -Is, SOURCE CURRENT (A) 25°C . T_A = 0.6 $I_D = -1mA$ 0.8 0.4 $I_{D} = -250 \mu A$ 0.4 0.2 0 0 0.2 -50 -25 0 25 50 75 100 125 150 0.4 0.6 0.8 1.0 1.2 -V_{SD}, SOURCE-DRAIN VOLTAGE (V) T_A, AMBIENT TEMPERATURE (°C) Fig. 18 Diode Forward Voltage vs. Current Fig. 17 Gate Threshold Variation vs. Ambient Temperature 100 1,000 T_A = 150°C C -IDSS, LEAKAGE CURRENT (nA) C, CAPACITANCE (pF) $T_A = 125^{\circ}C$ 100 C 10 Crss 10 T_A = 85°C $T_A = 25^{\circ}C$ 1 1 5 10 15 -V_{DS}, DRAIN-SOURCE VOLTAGE (V) 4 8 12 16 -V_{DS}, DRAIN-SOURCE VOLTAGE (V) 0 20 0 20 Fig. 20 Typical Leakage Current vs. Drain-Source Voltage Fig. 19 Typical Total Capacitance



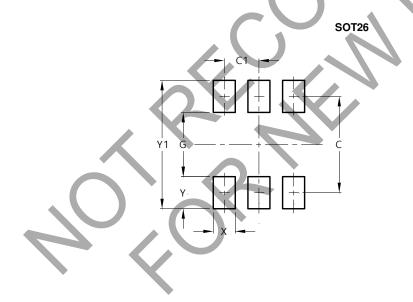
Package Outline Dimensions

Please see http://www.diodes.com/package-outlines.html for the latest version.



Suggested Pad Layout

Please see http://www.diodes.com/package-outlines.html for the latest version.



Dimensions	Value (in mm)
С	2.40
C1	0.95
G	1.60
Х	0.55
Y	0.80
Y1	3.20



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