



20V COMPLEMENTARY PAIR ENHANCEMENT MODE MOSFET

Product Summary

Device	BV _{DSS}	R _{DS(ON)} max	I_D max $T_A = +25$ °C (Note 6)
Q1	201/	0.4Ω @ V _{GS} = 4.5V	1.34A
Qi	20V	0.5Ω @ V _{GS} = 2.5V	1.65A
Q2	201/	0.7Ω @ V _{GS} = -4.5V	-1.14A
Q2	-20V	0.9Ω @ V _{GS} = -2.5V	-0.94A

Description and Applications

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

Portable Electronics

Features and Benefits

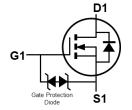
- Low On-Resistance
- Low Gate Threshold Voltage V_{GS(TH)} < 1V
- Low Input Capacitance
- Fast Switching Speed
- Low Input/Output Leakage
- Complementary Pair MOSFET
- Ultra-Small Surface Mount Package
- **ESD Protected**
- Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)
- Halogen and Antimony Free. "Green" Device (Note 3)
- Qualified to AEC-Q101 Standards for High Reliability
- **PPAP Capable (Note 4)**

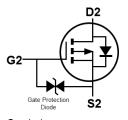
Mechanical Data

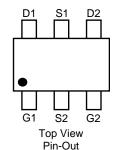
- Case: SOT26
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish Matte Tin Annealed over Copper Leadframe. Solderable per MIL-STD-202, Method 208 @3
- Terminals Connections: See Diagram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











Top View

Device Symbol

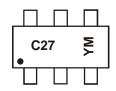
Ordering Information (Note 5)

Ī	Part Number	Case	Packaging
	DMC2700UDMQ-7	SOT26	3000/Tape & Reel

Notes:

- 1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
- 2. See http://www.diodes.com/quality/lead free.html 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. Automotive products are AEC-Q101 qualified and are PPAP capable. Refer to http://www.diodes.com/product_compliance_definitions.html.
- 5. For packaging details, go to our website at http://www.diodes.com/products/packages.html.

Marking Information



C27 = Product Type Marking Code YM = Date Code Marking Y = Year (ex: E = 2017)M = Month (ex: 9 = September)

Date Code Key

Year	201	7	2018		2019	20	20	2021		2022	2	2023
Code	Е		F		G	F	1			J		K
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec



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

Characteris	Symbol	Value	Unit	
Drain Source Voltage	V_{DSS}	20	V	
Gate-Source Voltage	V _{GSS}	±6	V	
Drain Current (Note 6)	$T_A = +25^{\circ}C$ $T_A = +85^{\circ}C$	l _D	1.34 0.97	А

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

Characterist	Symbol	Value	Unit	
Drain Source Voltage	V_{DSS}	-20	V	
Gate-Source Voltage	V_{GSS}	±6	V	
Drain Current (Note 6)	T _A = +25°C T _A = +85°C	ln.	-1.14 -1.07	А

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

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 6)	P_{D}	1.12	W
Thermal Resistance, Junction to Ambient (Note 6)	$R_{ hetaJA}$	111	°C/W
Operating and Storage Temperature Range	T_J , T_{STG}	-55 to +150	°C

Note: 6. 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.

March 2017

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

Characteristic	Symbol	Min	Тур	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 7)						
Drain-Source Breakdown Voltage	BV _{DSS}	20	_	_	V	$V_{GS} = 0V, I_D = 250\mu A$
Zero Gate Voltage Drain Current	I _{DSS}		_	1	μΑ	$V_{DS} = 20V$, $V_{GS} = 0V$
Gate-Source Leakage	I _{GSS}		_	±10	μΑ	$V_{GS} = \pm 4.5V, V_{DS} = 0V$
ON CHARACTERISTICS (Note 7)						
Gate Threshold Voltage	V _{GS(TH)}	0.5	_	1.0	V	$V_{DS} = V_{GS}, I_{D} = 250 \mu A$
			0.3	0.4		$V_{GS} = 4.5V, I_D = 600mA$
Static Drain-Source On-Resistance	R _{DS(ON)}	_	0.4	0.5	Ω	$V_{GS} = 2.5V, I_D = 500mA$
		_	0.5	0.7		$V_{GS} = 1.8V, I_D = 350mA$
Forward Transfer Admittance	Y _{fs}		1.4	_	S	$V_{DS} = 10V, I_D = 400mA$
Diode Forward Voltage (Note 7)	V _{SD}		0.7	1.2	V	$V_{GS} = 0V, I_{S} = 150mA$
DYNAMIC CHARACTERISTICS						
Input Capacitance	C _{iss}		60.67	_	pF	1/ 10// 1/ 01/
Output Capacitance	Coss		9.68	_	pF	$V_{DS} = 16V, V_{GS} = 0V$ - f = 1.0MHz
Reverse Transfer Capacitance	C _{rss}	_	5.37	_	pF	T = T.OIVINZ
Total Gate Charge	Qg	_	736.6	_		\\\\ 45\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\
Gate-Source Charge	Q _{gs}	1	93.6	_	рC	$V_{GS} = 4.5V, V_{DS} = 10V,$ $I_{D} = 250 \text{mA}$
Gate-Drain Charge	Q_{gd}		116.6	_		ID = 250IIIA
Turn-On Delay Time	t _{D(ON)}		5.1	_		101/1/ 4.51/
Turn-On Rise Time	t _R		7.4	_	ns	$V_{DD} = 10V, V_{GS} = 4.5V,$ $R_{L} = 47\Omega, R_{G} = 10\Omega,$
Turn-Off Delay Time	t _{D(OFF)}	_	26.7	_	115	_ / - /
Turn-Off Fall Time	t _F		12.3	_	$I_D = 200 \text{mA}$	

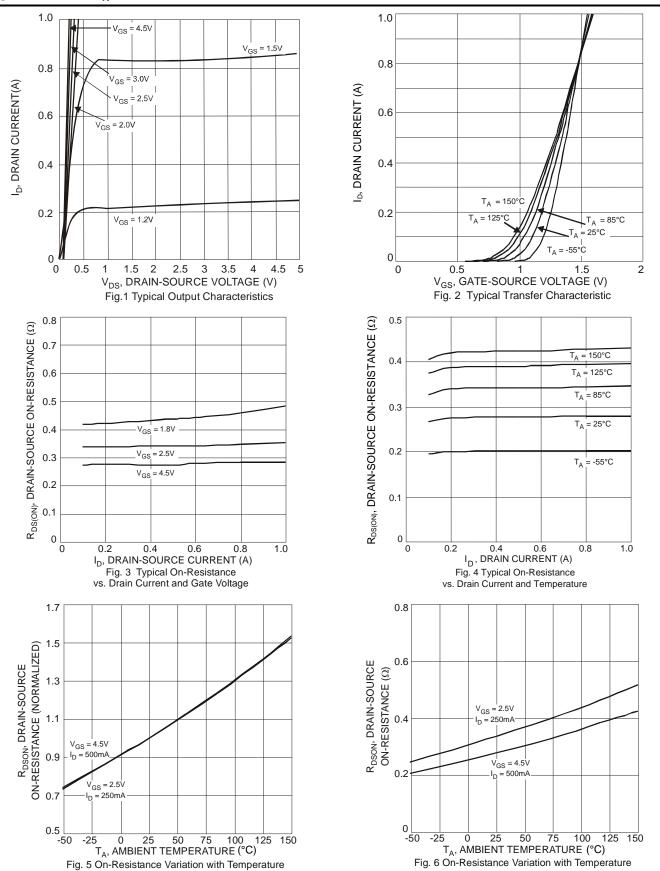
Electrical Characteristics P-CHANNEL – Q₂ (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Тур	Max	Unit	Test Condition	
OFF CHARACTERISTICS (Note 7)					•		
Drain-Source Breakdown Voltage	BV _{DSS}	-20			V	$V_{GS} = 0V, I_D = -250\mu A$	
Zero Gate Voltage Drain Current	I _{DSS}	_		-1	μΑ	$V_{DS} = -20V, V_{GS} = 0V$	
Gate-Source Leakage	I _{GSS}	_		±10	μΑ	$V_{GS} = \pm 4.5V, V_{DS} = 0V$	
ON CHARACTERISTICS (Note 7)							
Gate Threshold Voltage	V _{GS(TH)}	-0.5		-1.0	V	$V_{DS} = V_{GS}, I_{D} = -250 \mu A$	
			0.5	0.7		$V_{GS} = -4.5V$, $I_D = -430mA$	
Static Drain-Source On-Resistance	R _{DS(ON)}	_	0.7	0.9	Ω	$V_{GS} = -2.5V, I_D = -300mA$	
			1.0	1.3		$V_{GS} = -1.8V, I_D = -150mA$	
Forward Transfer Admittance	Y _{fs}	_	-0.9	_	S	$V_{DS} = -10V, I_{D} = -250mA$	
Diode Forward Voltage (Note 7)	V_{SD}	_	-0.8	-1.2	V	$V_{GS} = 0V, I_{S} = -150mA$	
DYNAMIC CHARACTERISTICS							
Input Capacitance	C _{iss}	_	59.76	1	pF	101/11/101/	
Output Capacitance	Coss	_	12.07		pF	V _{DS} = -16V, V _{GS} = 0V -f = 1.0MHz	
Reverse Transfer Capacitance	C _{rss}	_	6.36	_	pF	1 = 1.000112	
Total Gate Charge	Q_g	_	622.4			V 4.5V V 40V	
Gate-Source Charge	Q_{gs}	_	100.3	_	рC	$V_{GS} = -4.5V, V_{DS} = -10V,$ $I_{D} = -250\text{mA}$	
Gate-Drain Charge	Q_{gd}	_	132.2			ID = -250IIIA	
Turn-On Delay Time	t _{D(ON)}	_	5.1	1		10)/)/ 45)/	
Turn-On Rise Time	t _R	_	8.1	1	ns	$V_{DD} = -10V, V_{GS} = -4.5V,$ $R_1 = 47\Omega, R_G = 10\Omega,$	
Turn-Off Delay Time	t _{D(OFF)}	_	28.4	_	115	- / 0 /	
Turn-Off Fall Time	t _F	_	20.7	_		$I_D = -200 \text{mA}$	

Note: 7. Short duration pulse test used to minimize self-heating effect.



N-CHANNEL - Q1





N-CHANNEL - Q₁ (Cont.)

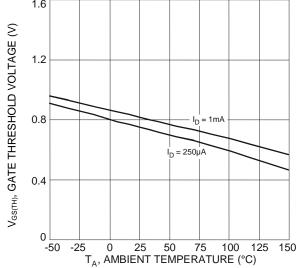
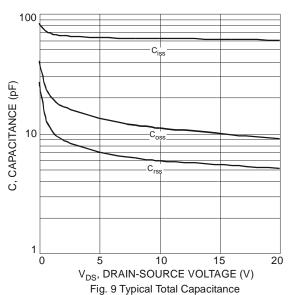
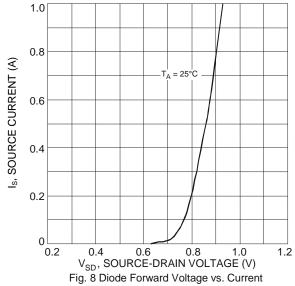


Fig. 7 Gate Threshold Variation vs. Ambient Temperature





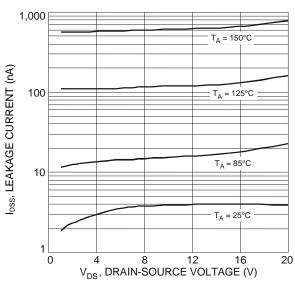


Fig. 10 Typical Leakage Current vs. Drain-Source Voltage



P-CHANNEL - Q₂

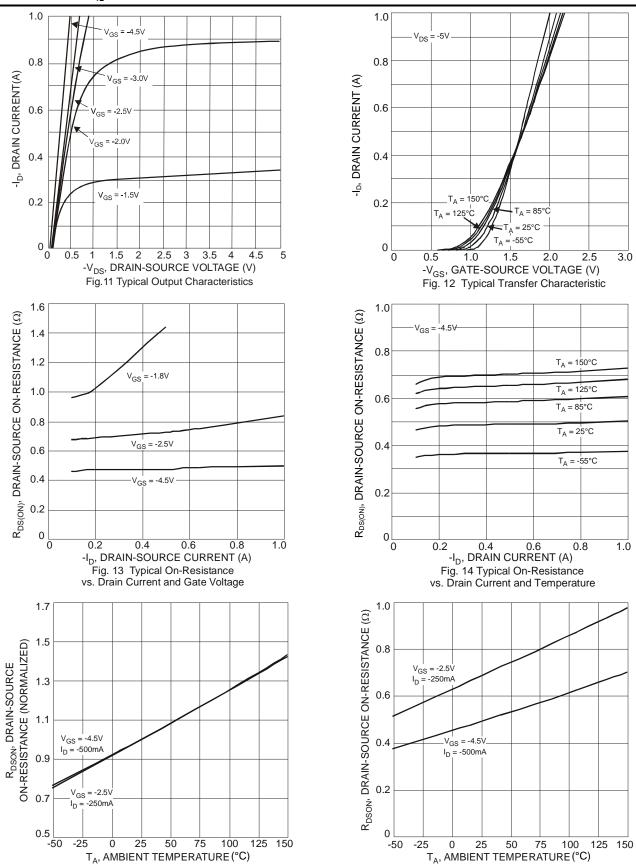


Fig. 15 On-Resistance Variation with Temperature

Fig. 16 On-Resistance Variation with Temperature



P-CHANNEL - Q₂ (Cont.)

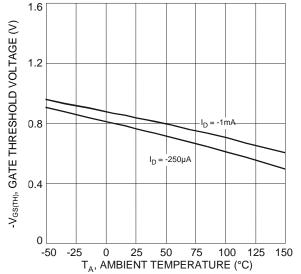
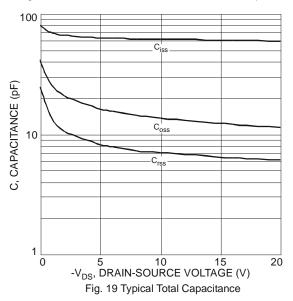
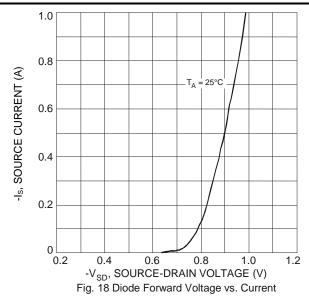
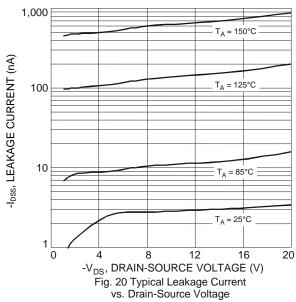


Fig. 17 Gate Threshold Variation vs. Ambient Temperature





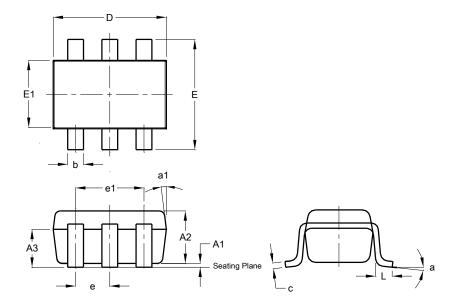




Package Outline Dimensions

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

SOT26

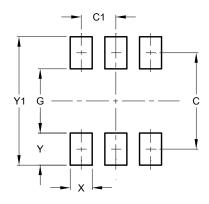


	SOT26				
Dim	Min	Max	Тур		
A1	0.013	0.10	0.05		
A2	1.00	1.30	1.10		
А3	0.70	0.80	0.75		
b	0.35	0.50	0.38		
С	0.10	0.20	0.15		
D	2.90	3.10	3.00		
е	-	-	0.95		
e1	-	-	1.90		
Е	2.70	3.00	2.80		
E1	1.50	1.70	1.60		
L	0.35	0.55	0.40		
а	-	-	8°		
a1	-	-	7°		
All	Dimen	sions	in mm		

Suggested Pad Layout

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

SOT26



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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