

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	20V	0.4Ω @ V _{GS} = 4.5V	1.34A
		0.5Ω @ V _{GS} = 2.5V	1.65A
Q2	-20V	0.7Ω @ V _{GS} = -4.5V	-1.14A
		0.9Ω @ V _{GS} = -2.5V	-0.94A

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)**

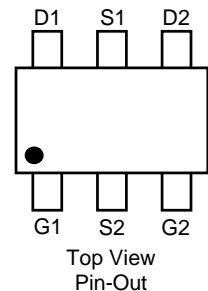
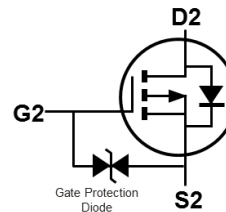
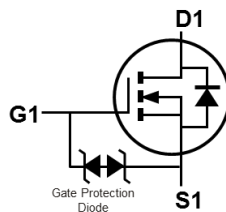
Description and Applications

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

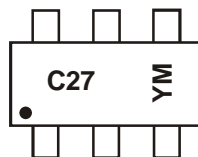
Mechanical Data

- 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 (E3)
- Terminals Connections: See Diagram Below
- Weight: 0.015 grams (Approximate)


Ordering Information (Note 5)

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	2017	2018	2019	2020	2021	2022	2023
Code	E	F	G	H	I	J	K

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Code	1	2	3	4	5	6	7	8	9	O	N	D

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

Characteristic	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	1.34
		T _A = +85°C	0.97
	I _D		A

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

Characteristic	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	-1.14
		T _A = +85°C	-1.07
	I _D		A

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 _{θJA}	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.

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

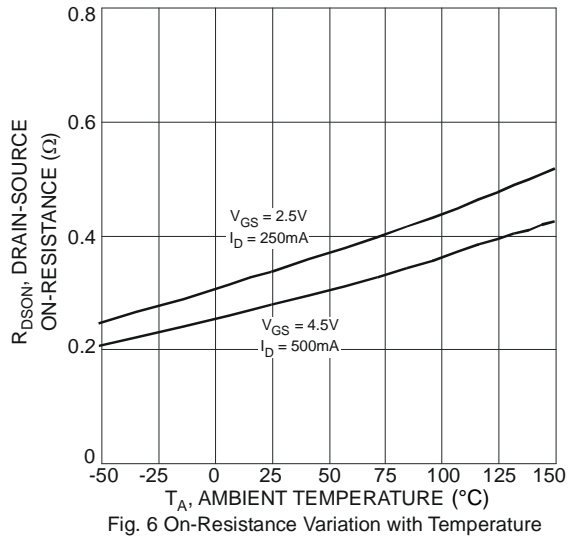
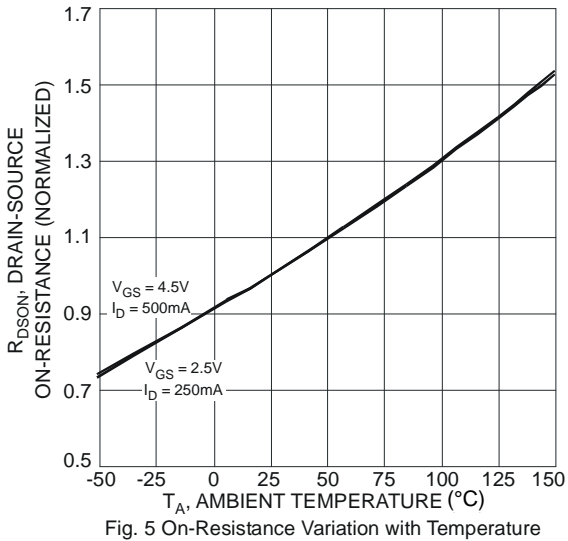
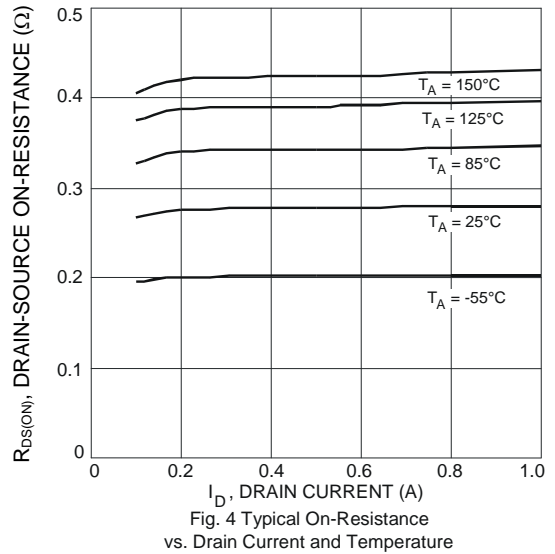
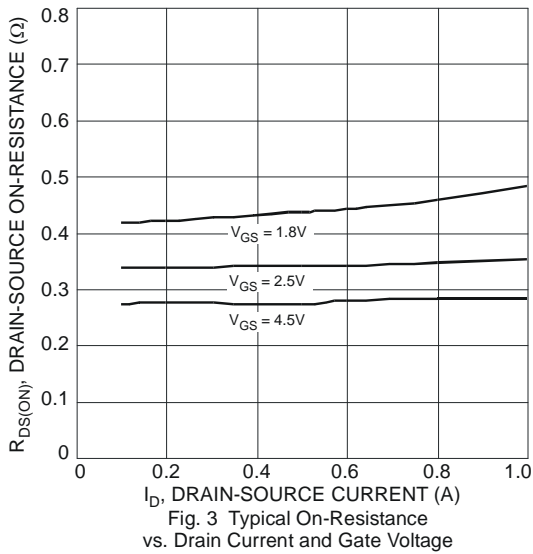
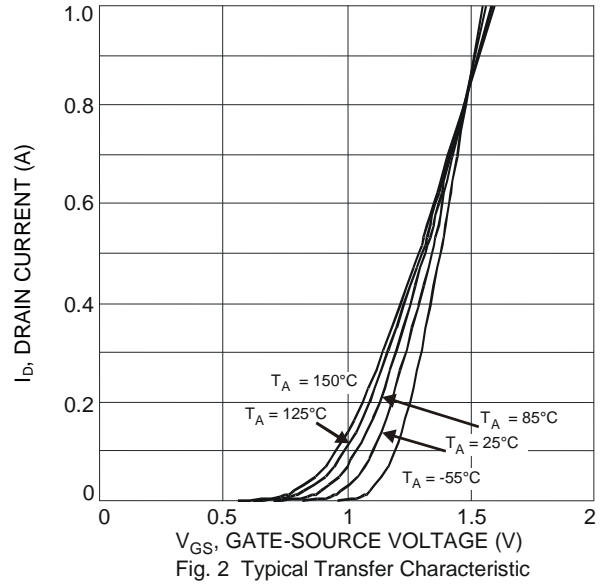
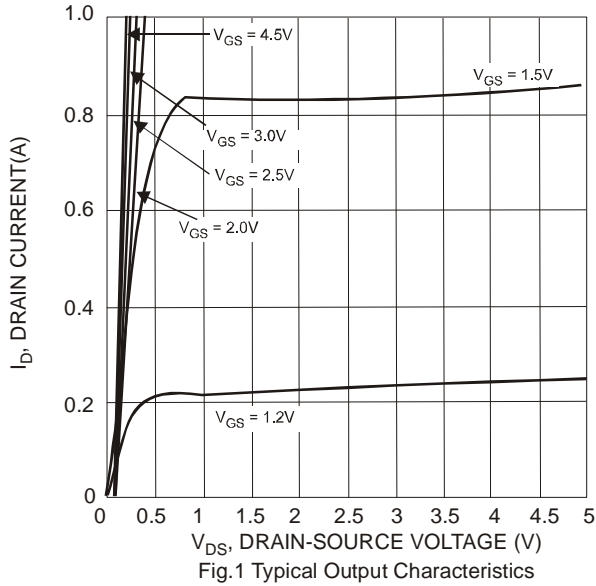
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 7)						
Drain-Source Breakdown Voltage	BV _{DSS}	20	—	—	V	V _{GS} = 0V, I _D = 250μA
Zero Gate Voltage Drain Current	I _{DSS}	—	—	1	μA	V _{DS} = 20V, V _{GS} = 0V
Gate-Source Leakage	I _{GSS}	—	—	±10	μA	V _{GS} = ±4.5V, V _{DS} = 0V
ON CHARACTERISTICS (Note 7)						
Gate Threshold Voltage	V _{GS(TH)}	0.5	—	1.0	V	V _{DS} = V _{GS} , I _D = 250μA
Static Drain-Source On-Resistance	R _{DS(ON)}	—	0.3	0.4	Ω	V _{GS} = 4.5V, I _D = 600mA
		—	0.4	0.5		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	V _{DS} = 16V, V _{GS} = 0V f = 1.0MHz
Output Capacitance	C _{oss}	—	9.68	—	pF	
Reverse Transfer Capacitance	C _{rss}	—	5.37	—	pF	
Total Gate Charge	Q _g	—	736.6	—	pC	V _{GS} = 4.5V, V _{DS} = 10V, I _D = 250mA
Gate-Source Charge	Q _{gs}	—	93.6	—		
Gate-Drain Charge	Q _{gd}	—	116.6	—		
Turn-On Delay Time	t _{D(ON)}	—	5.1	—	ns	V _{DD} = 10V, V _{GS} = 4.5V, R _L = 47Ω, R _G = 10Ω, I _D = 200mA
Turn-On Rise Time	t _R	—	7.4	—		
Turn-Off Delay Time	t _{D(OFF)}	—	26.7	—		
Turn-Off Fall Time	t _F	—	12.3	—		

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 7)						
Drain-Source Breakdown Voltage	BV _{DSS}	-20	—	—	V	V _{GS} = 0V, I _D = -250μA
Zero Gate Voltage Drain Current	I _{DSS}	—	—	-1	μA	V _{DS} = -20V, V _{GS} = 0V
Gate-Source Leakage	I _{GSS}	—	—	±10	μA	V _{GS} = ±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 = -250μA
Static Drain-Source On-Resistance	R _{DS(ON)}	—	0.5	0.7	Ω	V _{GS} = -4.5V, I _D = -430mA
		—	0.7	0.9		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	—	pF	V _{DS} = -16V, V _{GS} = 0V f = 1.0MHz
Output Capacitance	C _{oss}	—	12.07	—	pF	
Reverse Transfer Capacitance	C _{rss}	—	6.36	—	pF	
Total Gate Charge	Q _g	—	622.4	—	pC	V _{GS} = -4.5V, V _{DS} = -10V, I _D = -250mA
Gate-Source Charge	Q _{gs}	—	100.3	—		
Gate-Drain Charge	Q _{gd}	—	132.2	—		
Turn-On Delay Time	t _{D(ON)}	—	5.1	—	ns	V _{DD} = -10V, V _{GS} = -4.5V, R _L = 47Ω, R _G = 10Ω, I _D = -200mA
Turn-On Rise Time	t _R	—	8.1	—		
Turn-Off Delay Time	t _{D(OFF)}	—	28.4	—		
Turn-Off Fall Time	t _F	—	20.7	—		

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

N-CHANNEL – Q₁



N-CHANNEL – Q₁ (Cont.)

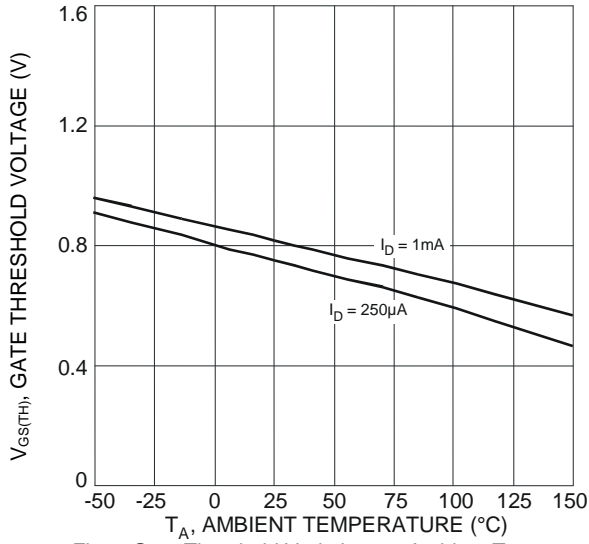


Fig. 7 Gate Threshold Variation vs. Ambient Temperature

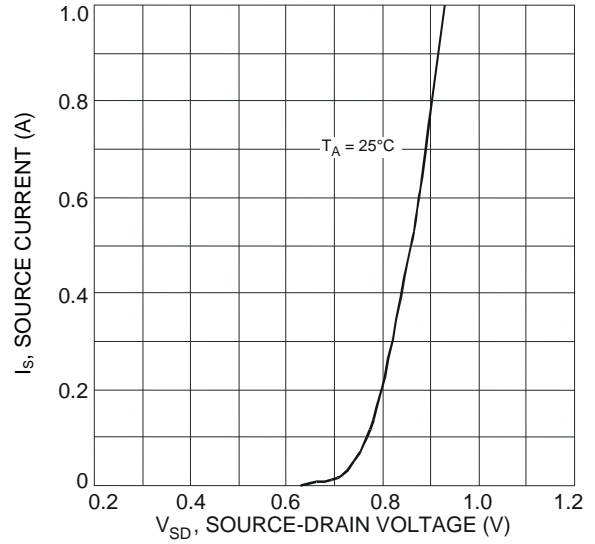


Fig. 8 Diode Forward Voltage vs. Current

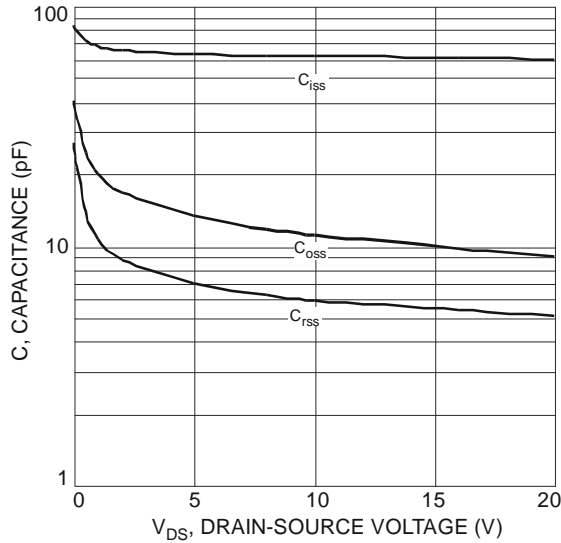


Fig. 9 Typical Total Capacitance

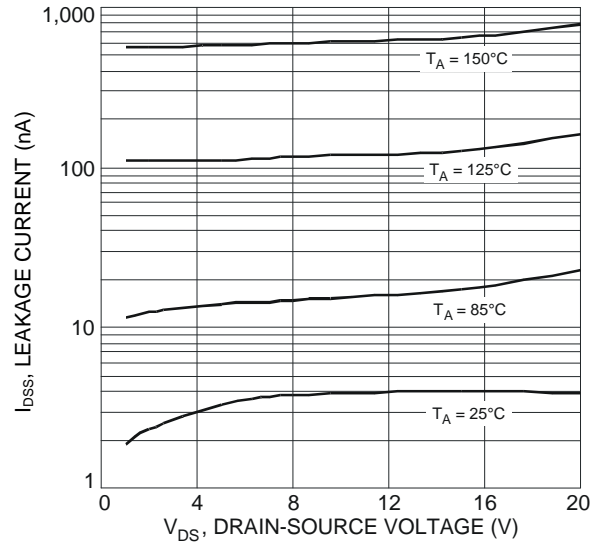


Fig. 10 Typical Leakage Current vs. Drain-Source Voltage

P-CHANNEL – Q₂

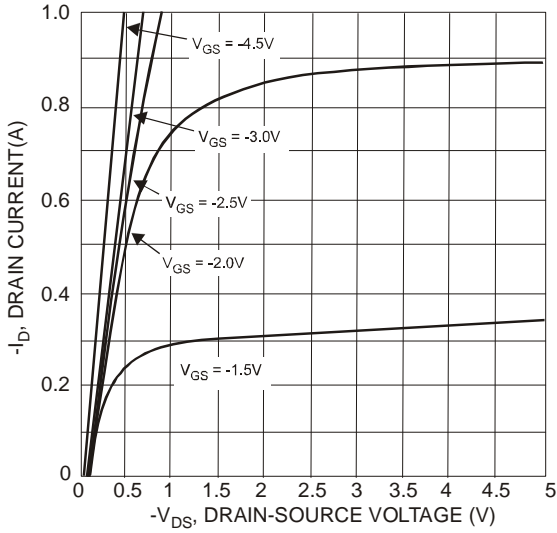


Fig. 11 Typical Output Characteristics

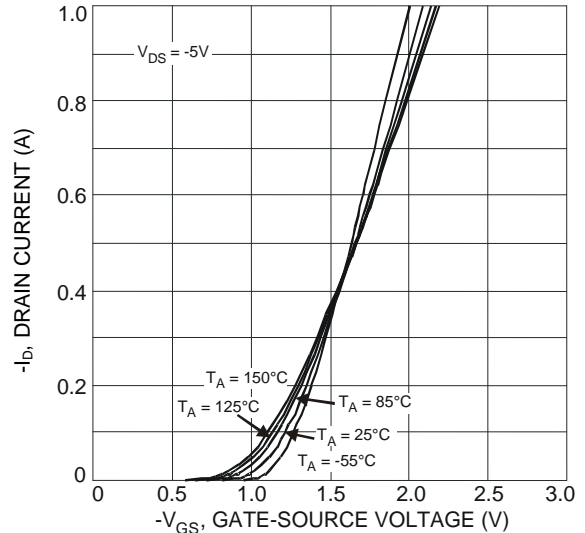


Fig. 12 Typical Transfer Characteristic

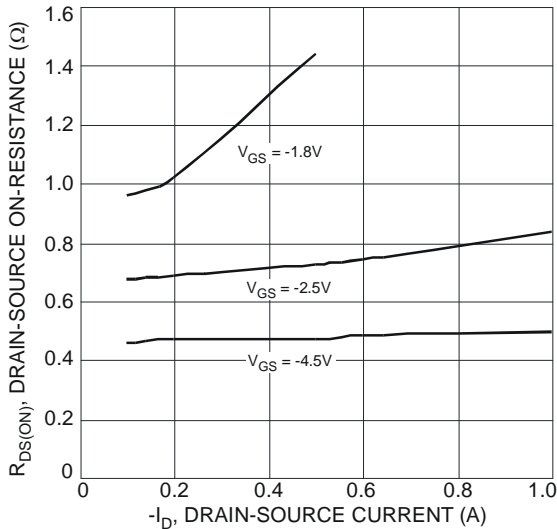


Fig. 13 Typical On-Resistance vs. Drain Current and Gate Voltage

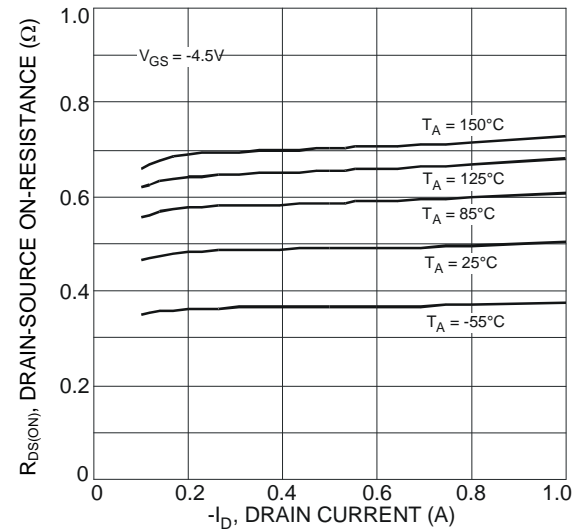


Fig. 14 Typical On-Resistance vs. Drain Current and Temperature

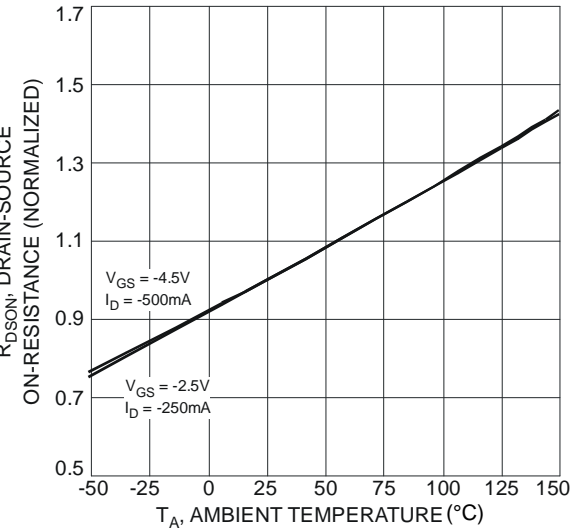


Fig. 15 On-Resistance Variation with Temperature

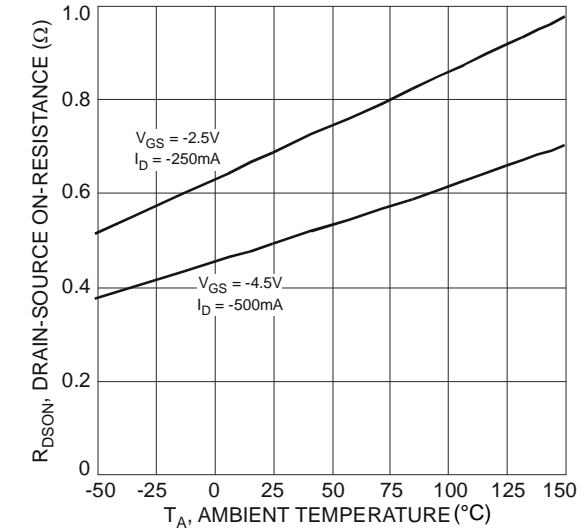


Fig. 16 On-Resistance Variation with Temperature

P-CHANNEL – Q₂ (Cont.)

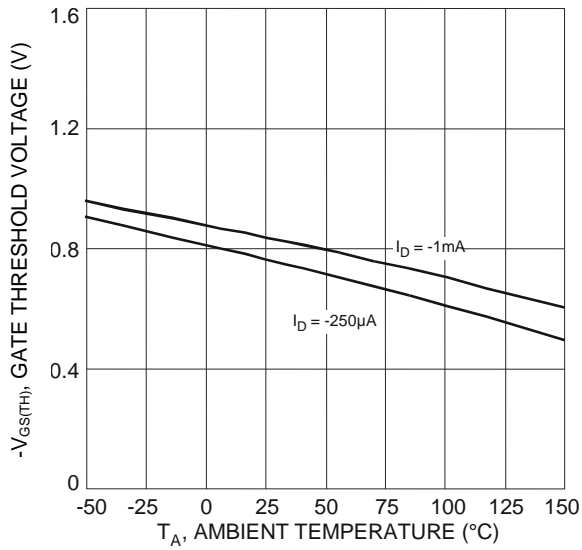


Fig. 17 Gate Threshold Variation vs. Ambient Temperature

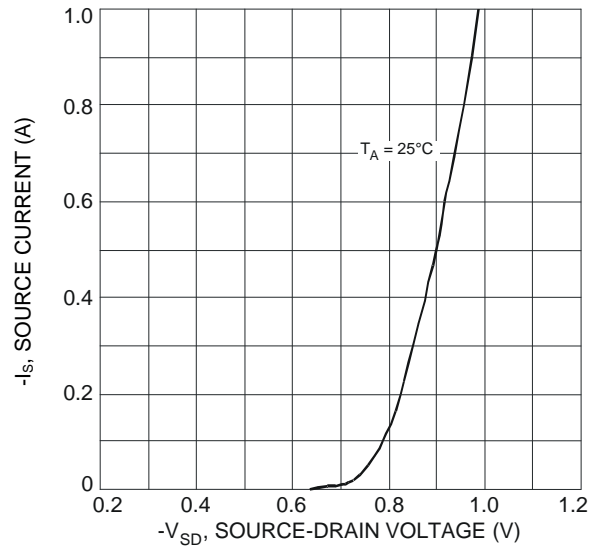


Fig. 18 Diode Forward Voltage vs. Current

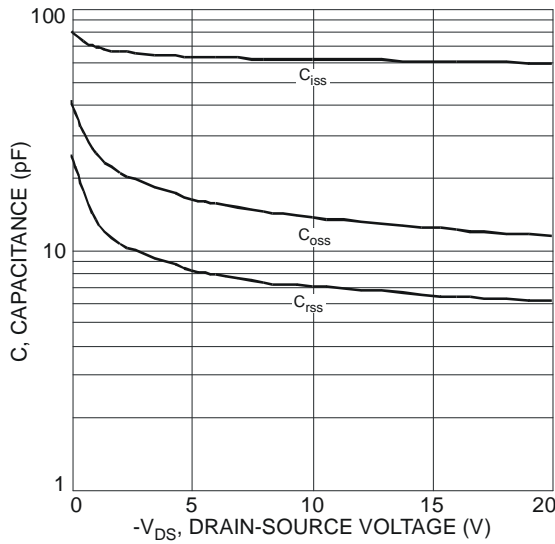


Fig. 19 Typical Total Capacitance

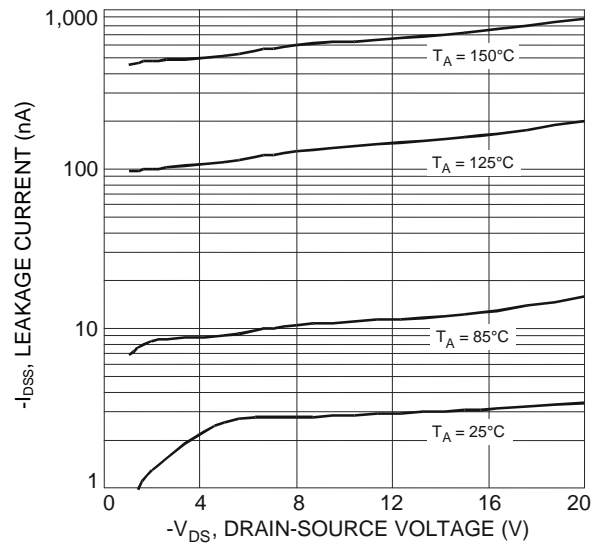
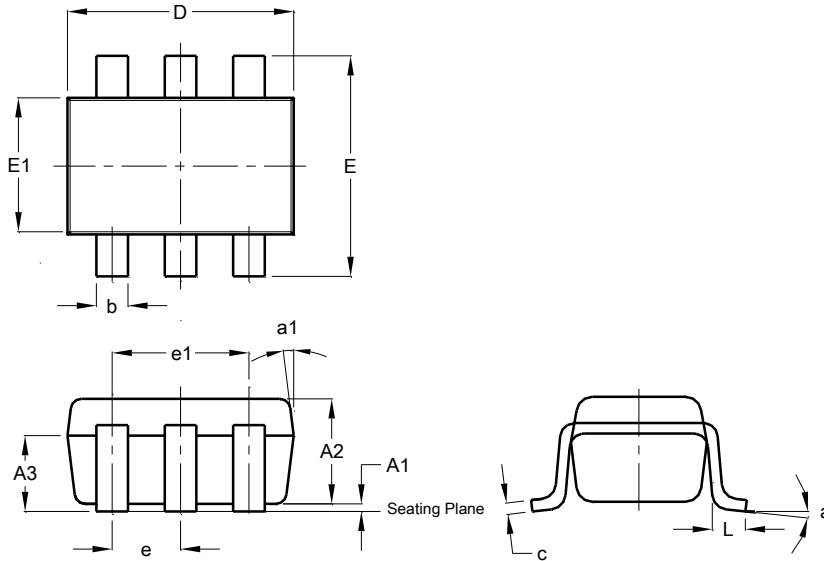


Fig. 20 Typical Leakage Current vs. Drain-Source Voltage

Package Outline Dimensions

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

SOT26

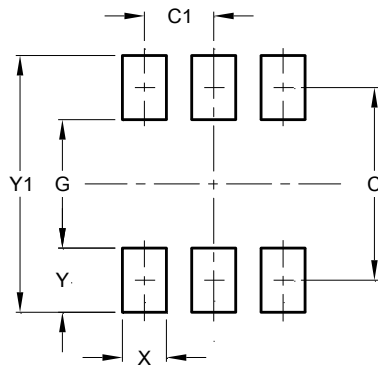


SOT26			
Dim	Min	Max	Typ
A1	0.013	0.10	0.05
A2	1.00	1.30	1.10
A3	0.70	0.80	0.75
b	0.35	0.50	0.38
c	0.10	0.20	0.15
D	2.90	3.10	3.00
e	-	-	0.95
e1	-	-	1.90
E	2.70	3.00	2.80
E1	1.50	1.70	1.60
L	0.35	0.55	0.40
a	-	-	8°
a1	-	-	7°
All Dimensions in mm			

Suggested Pad Layout

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

SOT26



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

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