

Features

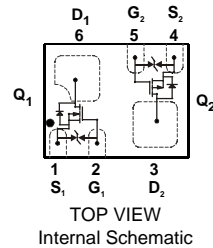
- Low On-Resistance
- Low Gate Threshold Voltage $V_{GS(th)} < 1V$
- Low Input Capacitance
- Fast Switching Speed
- Low Input/Output Leakage
- Complementary Pair MOSFET
- Ultra-Small Surface Mount Package
- **Lead Free/ROHS Compliant (Note 2)**
- **ESD Protected Gate**
- **"Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**



DFN1612-6

Mechanical Data

- Case: DFN1612-6
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020C
- Terminal Connections: See Diagram
- Terminals: Finish – NiPdAu over Copper leadframe. Solderable per MIL-STD-202, Method 208
- Marking Information: See Page 6
- Ordering Information: See Page 6
- Weight: 0.003 grams (approximate)



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}	±8	V
Drain Current (Note 1)	I_D	750 540	mA
		$T_A = 25^\circ C$ $T_A = 85^\circ C$	

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}	±8	V
Drain Current (Note 1)	I_D	-600 -430	mA
		$T_A = 25^\circ C$ $T_A = 85^\circ C$	

Thermal Characteristics @T_A = 25°C unless otherwise specified

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 1)	P_d	500	mW
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	250	°C/W
Operating and Storage Temperature Range	T_j, T_{STG}	-65 to +150	°C

- Notes:
1. Device mounted on FR-4 PCB.
 2. No purposefully added lead.
 3. Diodes Inc.'s "Green" policy can be found on our website at http://www.diodes.com/products/lead_free/index.php.

Electrical Characteristics N-CHANNEL – Q₁ @T_A = 25°C unless otherwise specified

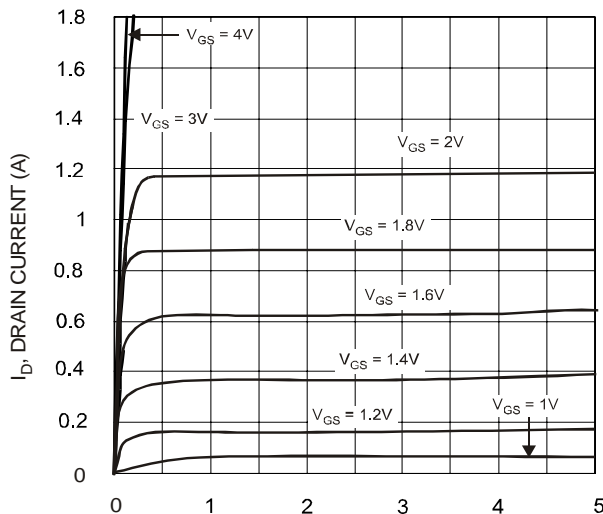
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 4)						
Drain-Source Breakdown Voltage	BV _{DSS}	20	—	—	V	V _{GS} = 0V, I _D = 10μA
Zero Gate Voltage Drain Current	I _{DSS}	—	—	1	μA	V _{DS} = 16V, V _{GS} = 0V
Gate-Source Leakage	I _{GSS}	—	—	± 1	μA	V _{GS} = ±4.5V, V _{DS} = 0V
ON CHARACTERISTICS (Note 4)						
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)}	—	0.4 0.5 0.7	0.55 0.70 0.90	Ω	V _{GS} = 4.5V, I _D = 540mA V _{GS} = 2.5V, I _D = 500mA V _{GS} = 1.8V, I _D = 350mA
Forward Transfer Admittance	Y _{fs}	200	—	—	mS	V _{DS} = 10V, I _D = 0.2A
Diode Forward Voltage (Note 4)	V _{SD}	0.5	—	1.2	V	V _{GS} = 0V, I _S = 115mA
DYNAMIC CHARACTERISTICS						
Input Capacitance	C _{iSS}	—	—	150	pF	V _{DS} = 16V, V _{GS} = 0V f = 1.0MHz
Output Capacitance	C _{oSS}	—	—	25	pF	
Reverse Transfer Capacitance	C _{rSS}	—	—	20	pF	

Electrical Characteristics P-CHANNEL – Q₂ @T_A = 25°C unless otherwise specified

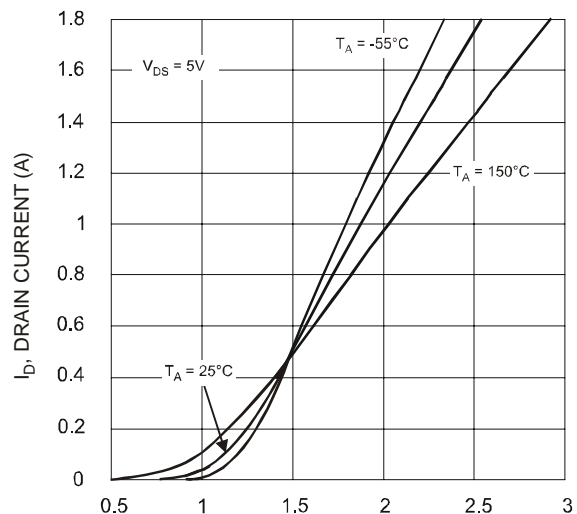
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 4)						
Drain-Source Breakdown Voltage	BV _{DSS}	-20	—	—	V	V _{GS} = 0V, I _D = -250μA
Zero Gate Voltage Drain Current	I _{DSS}	—	—	-1.0	μA	V _{DS} = -20V, V _{GS} = 0V
Gate-Source Leakage	I _{GSS}	—	—	± 1.0	μA	V _{GS} = ±4.5V, V _{DS} = 0V
ON CHARACTERISTICS (Note 4)						
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)}	—	0.7 1.1 1.7	0.9 1.4 2.0	Ω	V _{GS} = -4.5V, I _D = -430mA V _{GS} = -2.5V, I _D = -300mA V _{GS} = -1.8V, I _D = -150mA
Forward Transfer Admittance	Y _{fs}	200	—	—	mS	V _{DS} = 10V, I _D = 0.2A
Diode Forward Voltage (Note 4)	V _{SD}	-0.5	—	-1.2	V	V _{GS} = 0V, I _S = -115mA
DYNAMIC CHARACTERISTICS						
Input Capacitance	C _{iSS}	—	—	175	pF	V _{DS} = -16V, V _{GS} = 0V f = 1.0MHz
Output Capacitance	C _{oSS}	—	—	30	pF	
Reverse Transfer Capacitance	C _{rSS}	—	—	20	pF	

Notes: 4. Short duration pulse test used to minimize self-heating effect.

Q₁, N-CHANNEL



V_{DS}, DRAIN SOURCE VOLTAGE (V)
Fig. 1 Typical Output Characteristics



V_{GS}, GATE SOURCE VOLTAGE (V)
Fig. 2 Typical Transfer Characteristics

Q₁, N-CHANNEL, continued

NEW PRODUCT

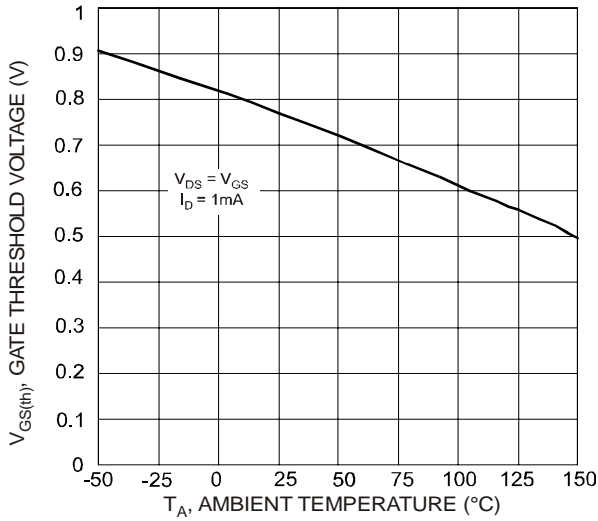


Fig. 3 Gate Threshold Voltage vs. Ambient Temperature

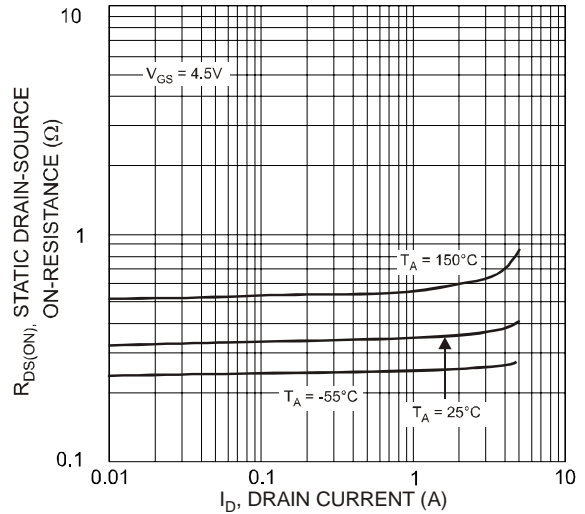


Fig. 4 Static Drain-Source On-Resistance vs. Drain Current

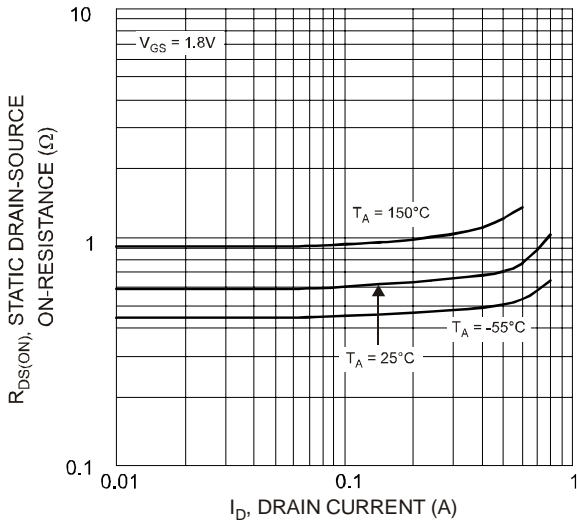


Fig. 5 Static Drain-Source On-Resistance vs. Drain Current

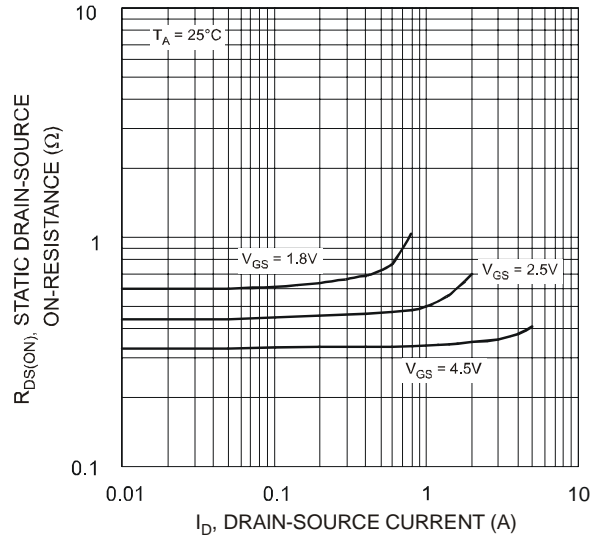


Fig. 6 Static Drain-Source On-Resistance vs. Drain-Source Current vs. Gate Source Voltage

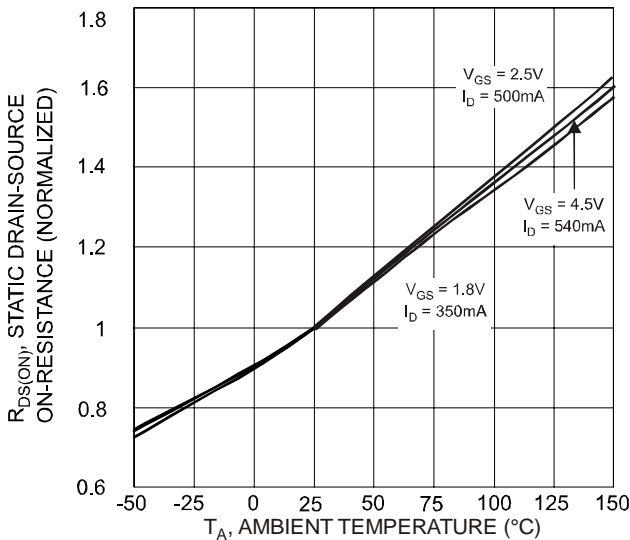


Fig. 7 Static Drain-Source On-State Resistance vs. Ambient Temperature

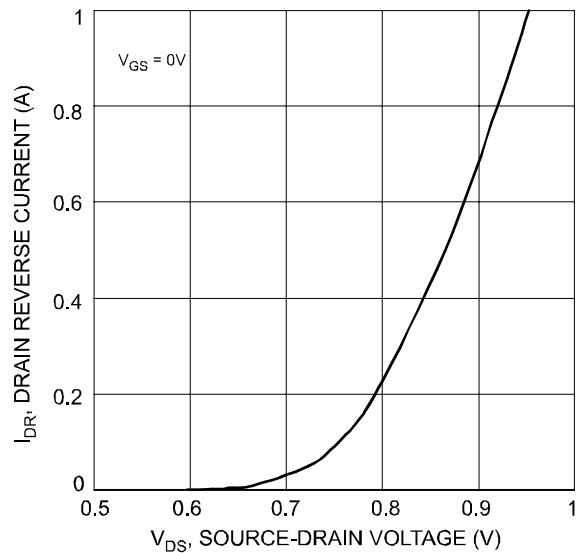


Fig. 8 Drain Reverse Current vs. Source-Drain Voltage

Q₁, N-CHANNEL, continued

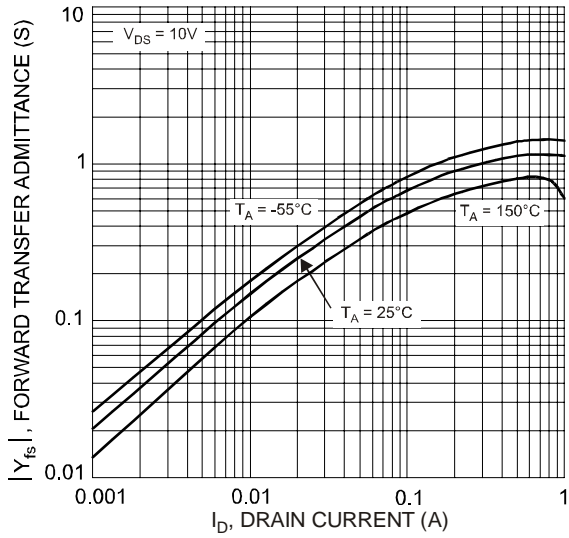


Fig. 9 Forward Transfer Admittance vs. Drain Current

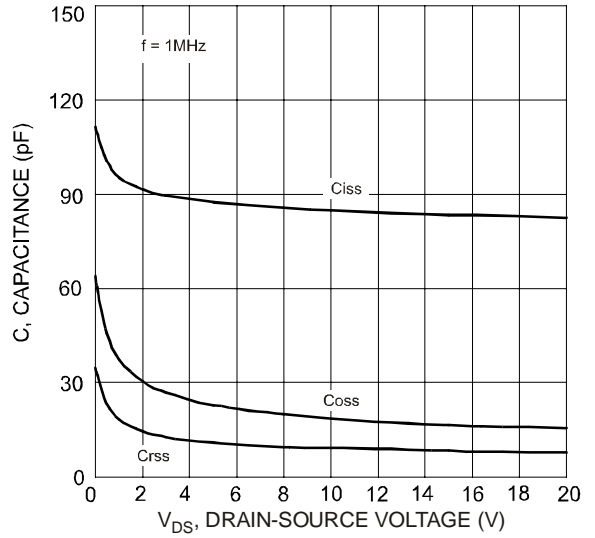


Fig. 10 Typical Capacitance

Q₂, P-CHANNEL

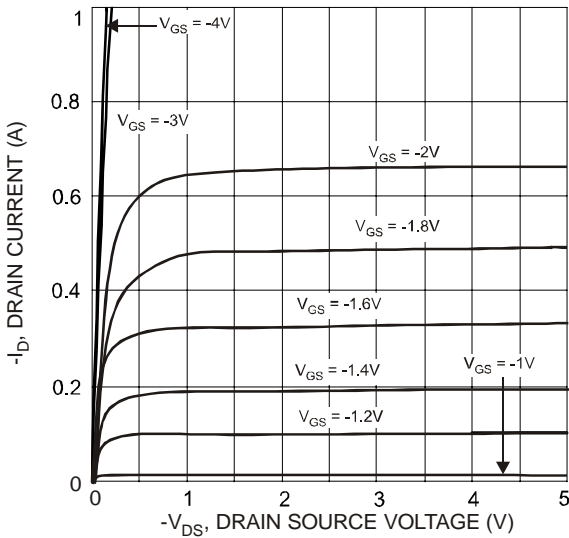


Fig. 11 Typical Output Characteristics

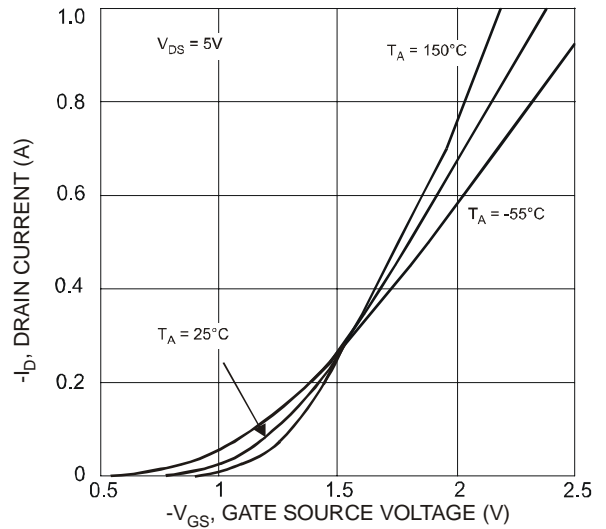


Fig. 12 Typical Transfer Characteristics

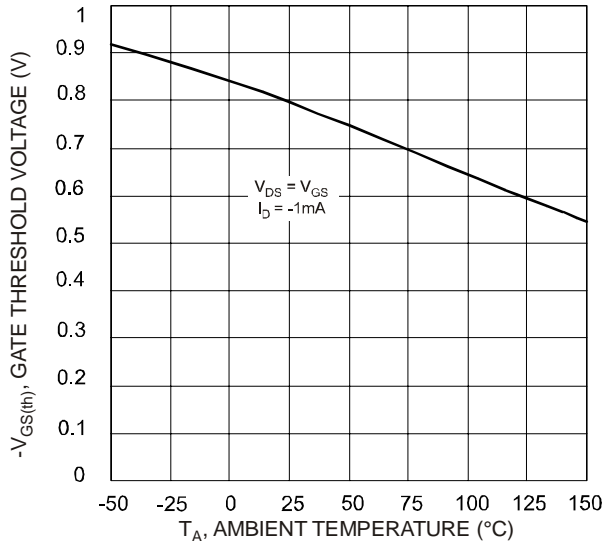


Fig. 13 Gate Threshold Voltage vs. Ambient Temperature

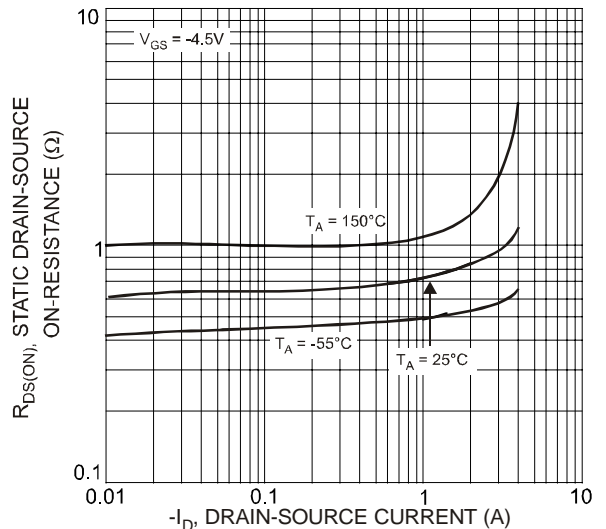


Fig. 14 Static Drain-Source On-Resistance vs. Drain Current

Q₂, P-CHANNEL, continued

NEW PRODUCT

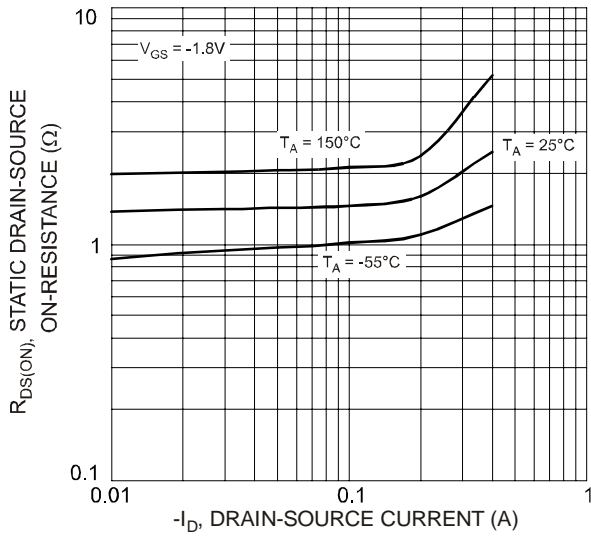


Fig. 15 Static Drain-Source On-Resistance vs. Drain Current

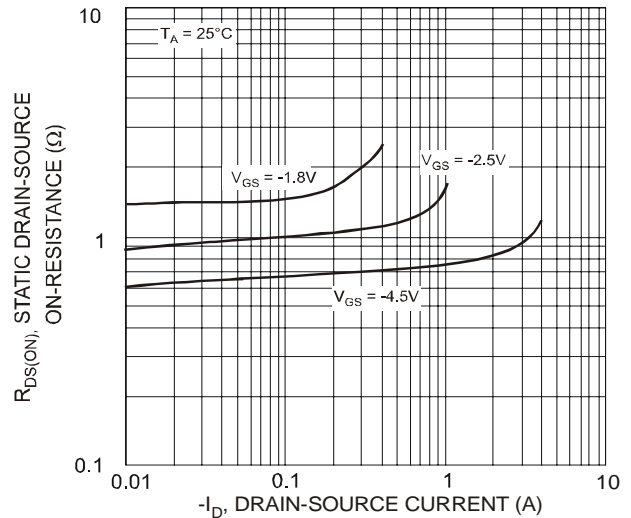


Fig. 16 Static Drain-Source On-Resistance vs. Drain-Source Current vs. Gate Source Voltage

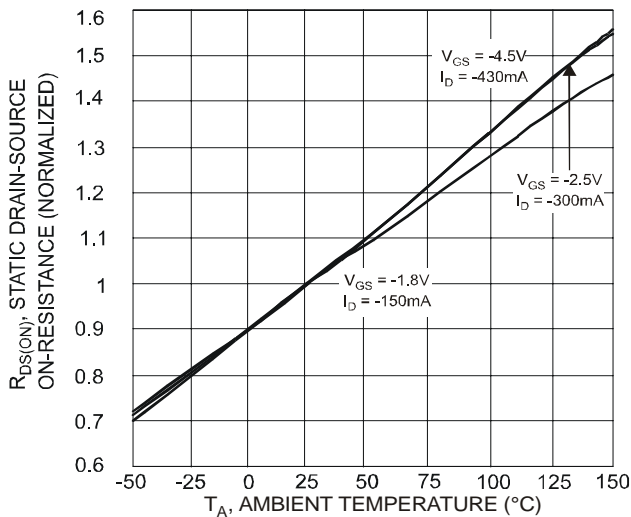


Fig. 17 Static Drain-Source On-State Resistance vs. Ambient Temperature

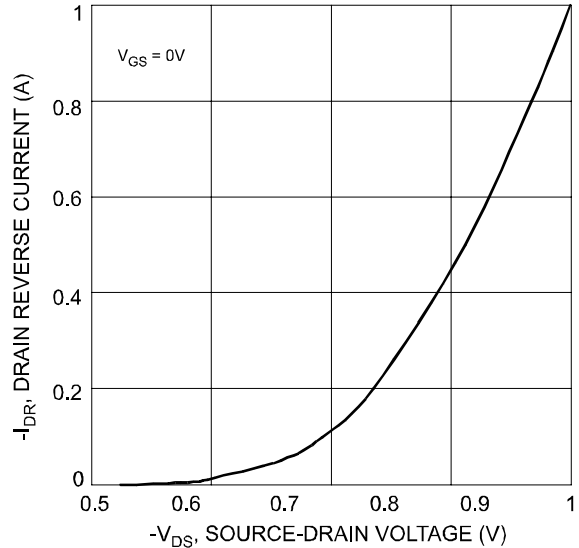


Fig. 18 Drain Reverse Current vs. Source-Drain Voltage

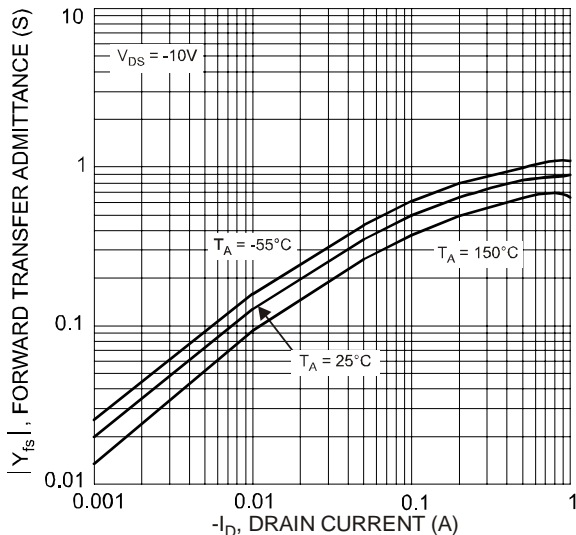


Fig. 19 Forward Transfer Admittance vs. Drain Current

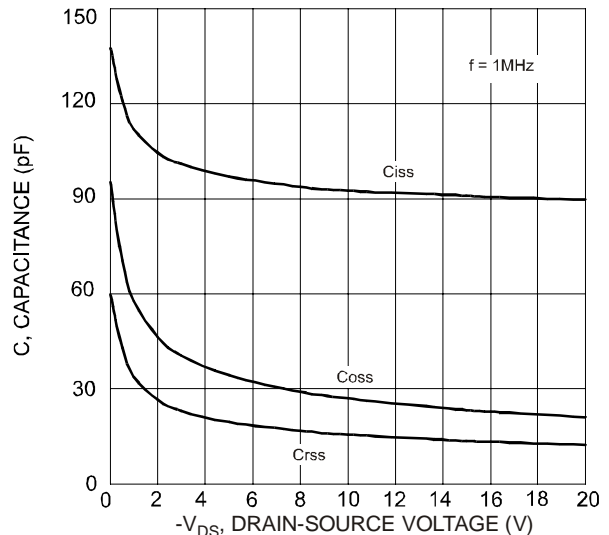


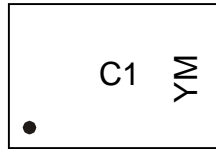
Fig. 20 Typical Capacitance

Ordering Information (Note 5)

Part Number DMC2004LPK-7	Case DFN1612-6	Packaging 3000/Tape & Reel
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Notes: 5. For packaging details, go to our website at <http://www.diodes.com/datasheets/ap02007.pdf>.

Marking Information

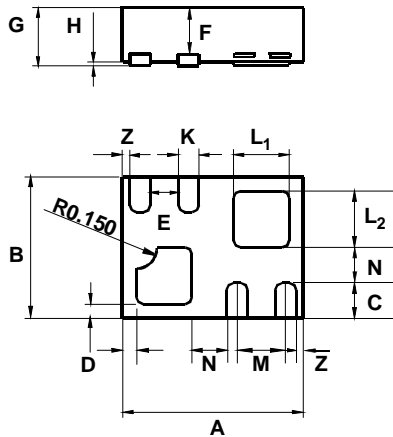


C1 = Marking Code
YM = Date Code Marking
Y = Year ex: U = 2007
M = Month ex: 9 = September

Date Code Key

Year	2007			2008			2009			2010			2011		2012	
Code	U			V			W			X			Y		Z	
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				

Package Outline Dimensions

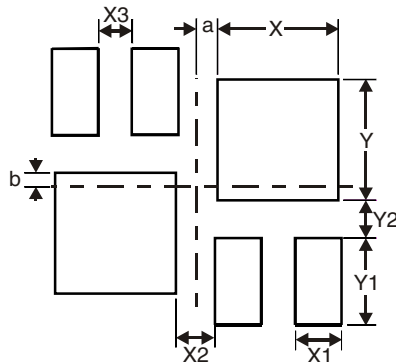


DFN1612-6			
Dim	Min	Max	Typ
A	1.55	1.68	1.60
B	1.15	1.28	1.20
C	0.20	0.30	0.25
D*	—	—	0.15
E**	—	—	0.20
F	—	—	0.37
G	0.47	0.53	0.50
H	0	0.05	0.02
K*	—	—	0.13
L	—	—	—
L ₁ **	0.40	0.60	0.50
L ₂ **	0.45	0.65	0.55
M**	—	—	0.40
N*	—	—	0.25
Z**	—	—	0.10

All Dimensions in mm

* Dimensions D, K, N Repeat 4x
** Dimensions E, L₁, L₂, M, Z Repeat 2x

Suggested Pad Layout



Dimensions	Value (in mm)
X	0.60
Y	0.65
X1	0.25
Y1	0.45
X2	0.175
Y2	0.15
X3	0.15
a	0.10
b	0.15

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