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Diodes Incorporated
DMC3400SDW-7

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NEW PRODUCT

Lead-free Green

DMC3400SDW

COMPLEMENTARY PAIR ENHANCEMENT MODE MOSFET

Product Summary

Device	$V_{(BR)DSS}$	$R_{DS(ON)}$ max	I_D max T_A = +25°C
Q1	30	0.4Ω @ V_{GS} = 10V	0.65A
		0.7Ω @ V_{GS} = 4.5V	0.52A
Q2	-30	0.9Ω @ V_{GS} = -10V	-0.45A
		1.7Ω @ V_{GS} = -4.5V	-0.33A

Features and Benefits

- Low On-Resistance
- Low Input Capacitance
- Fast Switching Speed
- **ESD Protected Gate**
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**

Description and Applications

This MOSFET is 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.

- Motor Control
- Power Management Functions
- DC-DC Converters

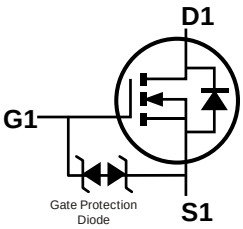
Mechanical Data

- Case: SOT363
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections Indicator: See Diagram
- Terminals: Finish — Matte Tin Annealed over Copper Leadframe. Solderable per MIL-STD-202, Method 208 e3
- Weight: 0.027 grams (Approximate)

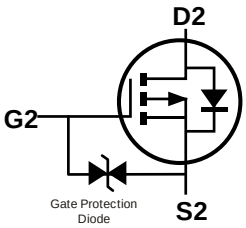
ESD PROTECTED

SOT363

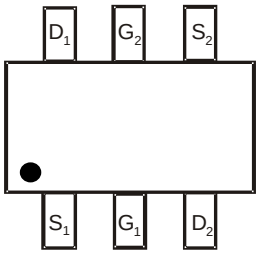
Top View



Q1 N-CHANNEAL



Q2 P-CHANNEAL



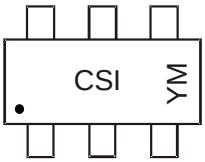
Top View
Pin out

Ordering Information (Note 4)

Part Number	Case	Packaging
DMC3400SDW-7	SOT363	3000/Tape & Reel
DMC3400SDW-13	SOT363	10000/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. For packaging details, go to our website at http://www.diodes.com/products/packages.html.

Marking Information



CSI = Product Type Marking Code
YM = Date Code Marking
Y or $\overline{Y}$= Year (ex: B = 2014)
M = Month (ex: 9 = September)

Date Code Key

Year	2014	2015	2016	2017	2018	2019	2020
Code	B	C	D	E	F	G	H

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

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Maximum Ratings (@T_A = +25°C, unless otherwise specified.)

Characteristic			Symbol	Value_Q1	Value_Q2	Units
Drain-Source Voltage			V_{DSS}	30	-30	V
Gate-Source Voltage			V_{GSS}	±20	±20	V
Continuous Drain Current (Note 6) V_{GS} = 10V	Steady State	T_A = +25°C T_A = +70°C	I_D	0.65 0.50	-0.45 -0.36	A
Maximum Continuous Body Diode Forward Current (Note 6)			I_S	0.4	-0.35	A
Pulsed Drain Current (10µs Pulse, Duty Cycle = 1%)			I_{DM}	4	-3	A

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

Characteristic		Symbol	Value	Units
Total Power Dissipation (Note 5)		P_D	0.31	W
Thermal Resistance, Junction to Ambient (Note 5)	Steady State	$R_{\theta JA}$	406	°C/W
Total Power Dissipation (Note 6)		P_D	0.39	W
Thermal Resistance, Junction to Ambient (Note 6)	Steady State	$R_{\theta JA}$	319	°C/W
Thermal Resistance, Junction to Case		$R_{\theta JC}$	126	°C/W
Operating and Storage Temperature Range		T_J, T_{STG}	-55 to +150	°C

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}	30	-	-	V	V_{GS} = 0V, I_D = 250µA
Zero Gate Voltage Drain Current	I_{DSS}	-	-	1	µA	V_{DS} = 24V, V_{GS} = 0V
Gate-Source Leakage	I_{GSS}	-	-	±10	µA	V_{GS} = ±16V, V_{DS} = 0V
ON CHARACTERISTICS (Note 7)						
Gate Threshold Voltage	$V_{GS(TH)}$	0.8	-	1.6	V	V_{DS} = V_{GS}, I_D = 250µA
Static Drain-Source On-Resistance	$R_{DS(ON)}$	-	0.2	0.4	Ω	V_{GS} = 10V, I_D = 0.59A
		-	0.3	0.7		V_{GS} = 4.5V, I_D = 0.2A
Diode Forward Voltage	V_{SD}	-	0.8	1.2	V	V_{GS} = 0V, I_S = 0.23A
DYNAMIC CHARACTERISTICS (Note 8)						
Input Capacitance	C_{iss}	-	55	-	pF	V_{DS} = 15V, V_{GS} = 0V, f = 1.0MHz
Output Capacitance	C_{oss}	-	8.5	-	pF	
Reverse Transfer Capacitance	C_{rss}	-	6.5	-	pF	
Gate Resistance	R_g	-	92	-	Ω	V_{DS} = V_{GS} = 0V, f = 1.0MHz
Total Gate Charge (V_{GS} = 4.5V)	Q_g	-	0.6	-	nC	V_{DS} = 10V, I_D = 250mA
Total Gate Charge (V_{GS} = 10V)	Q_g	-	1.4	-	nC	
Gate-Source Charge	Q_{gs}	-	0.2	-	nC	
Gate-Drain Charge	Q_{gd}	-	0.1	-	nC	
Turn-On Delay Time	$t_{D(ON)}$	-	3.8	-	ns	V_{GS} = 10V, V_{DS} = 30V, I_D = 100mA, R_G = 1Ω
Turn-On Rise Time	t_R	-	3.5	-	ns	
Turn-Off Delay Time	$t_{D(OFF)}$	-	25.2	-	ns	
Turn-Off Fall Time	t_F	-	18.8	-	ns	

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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}	-30	-	-	V	V_{GS} = 0V, I_D = -250μA
Zero Gate Voltage Drain Current	I_{DSS}	-	-	-1	μA	V_{DS} = -24V, V_{GS} = 0V
Gate-Source Leakage	I_{GSS}	-	-	±10	μA	V_{GS} = ±16V, V_{DS} = 0V
ON CHARACTERISTICS (Note 7)						
Gate Threshold Voltage	$V_{GS(TH)}$	-1	-	-2.6	V	V_{DS} = V_{GS}, I_D = -250μA
Static Drain-Source On-Resistance	$R_{DS(ON)}$	-	0.36	0.9	Ω	V_{GS} = -10V, I_D = -0.42A
		-	0.57	1.7		V_{GS} = -4.5V, I_D = -0.2A
Diode Forward Voltage	V_{SD}	-	-0.8	-1.2	V	V_{GS} = 0V, I_S = -0.23A
DYNAMIC CHARACTERISTICS (Note 8)						
Input Capacitance	C_{iss}	-	54	-	pF	V_{DS} = -15V, V_{GS} = 0V, f = 1.0MHz
Output Capacitance	C_{oss}	-	10	-	pF	
Reverse Transfer Capacitance	C_{rss}	-	8.3	-	pF	
Gate Resistance	R_g	-	240	-	Ω	V_{DS} = V_{GS} = 0V, f = 1.0MHz
Total Gate Charge (V_{GS} = -4.5V)	Q_g	-	0.6	-	nC	V_{DS} = -10V, I_D = -0.24A
Total Gate Charge (V_{GS} = -10V)	Q_g	-	1.3	-	nC	
Gate-Source Charge	Q_{gs}	-	0.2	-	nC	
Gate-Drain Charge	Q_{gd}	-	0.2	-	nC	
Turn-On Delay Time	$t_{D(ON)}$	-	5.7	-	ns	V_{GS} = -10V, V_{DD} = -15V, I_D = -0.5A, R_G = 1Ω
Turn-On Rise Time	t_R	-	8.8	-	ns	
Turn-Off Delay Time	$t_{D(OFF)}$	-	35	-	ns	
Turn-Off Fall Time	t_F	-	19	-	ns	

Notes:
5. Device mounted on FR-4 PCB, with minimum recommended pad layout.
6. Device mounted on 1" x 1" FR-4 PCB with high coverage 2oz. Copper, single sided.
7. Short duration pulse test used to minimize self-heating effect.
8. Guaranteed by design. Not subject to product testing.

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Typical Characteristics - N-CHANNEL

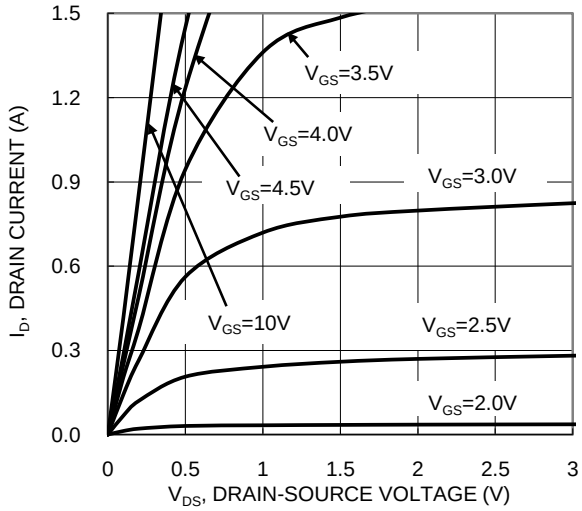

Figure 1. Typical Output Characteristic

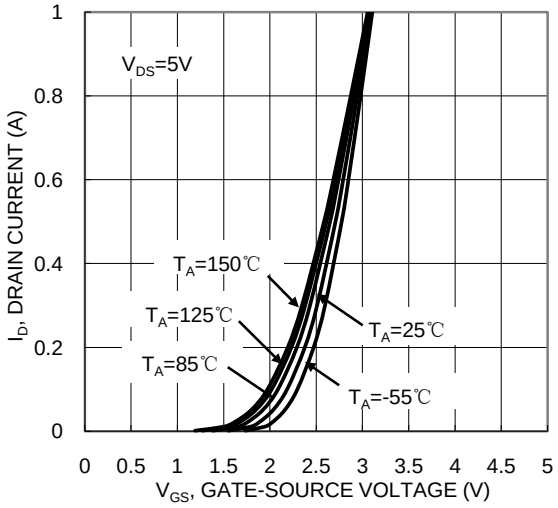

Figure 2. Typical Transfer Characteristic

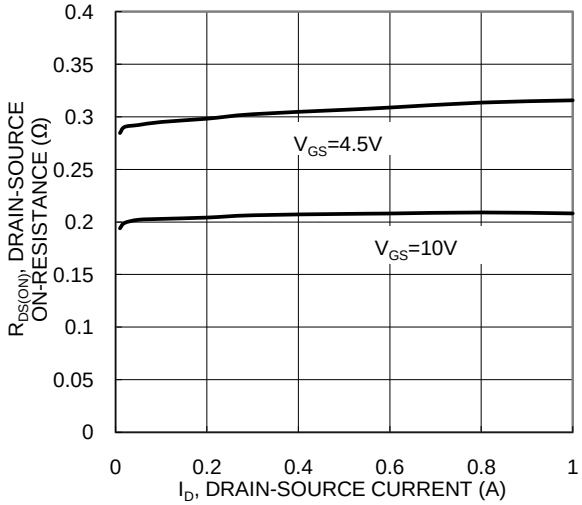

Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage

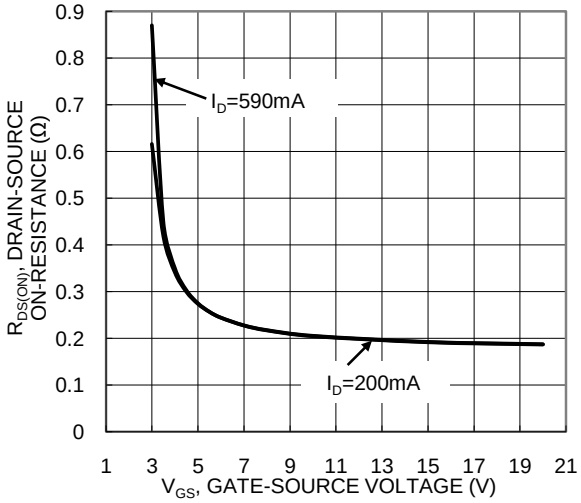

Figure 4. Typical Transfer Characteristic

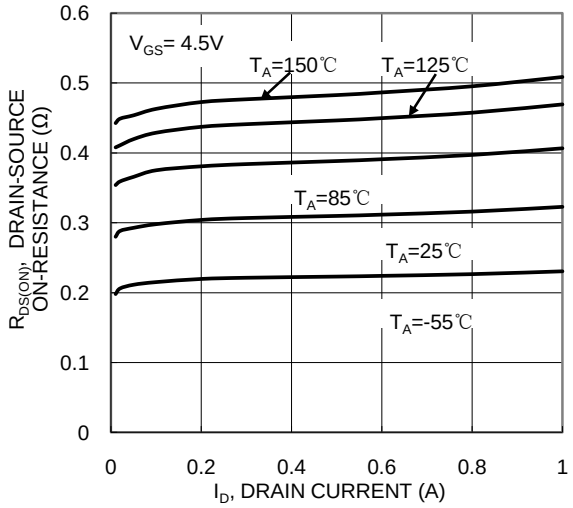

Figure 5. Typical On-Resistance vs. Drain Current and Temperature

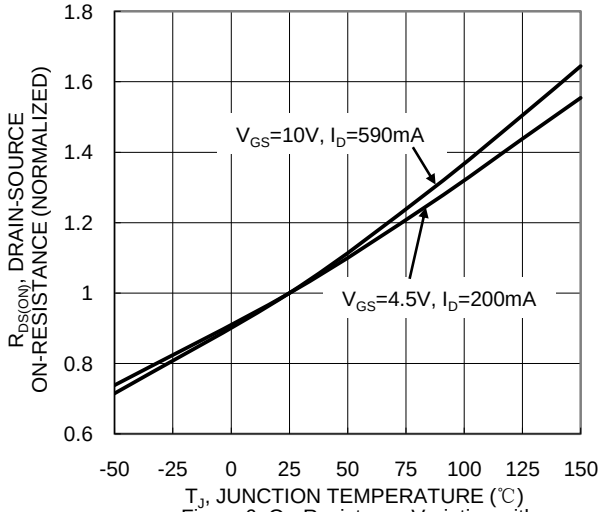

Figure 6. On-Resistance Variation with Temperature

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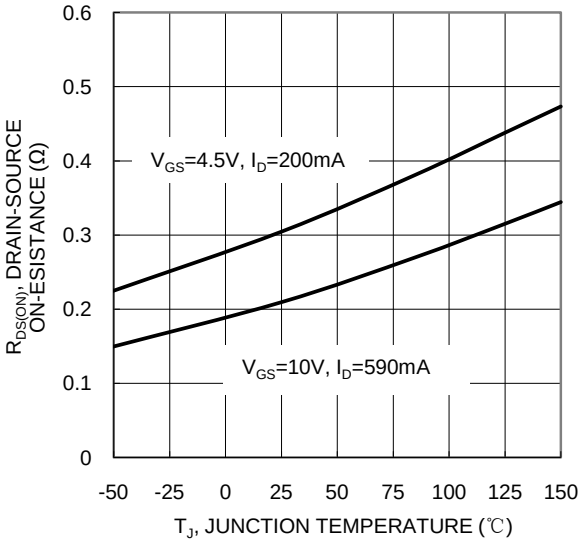

Figure 7. On-Resistance Variation with Temperature

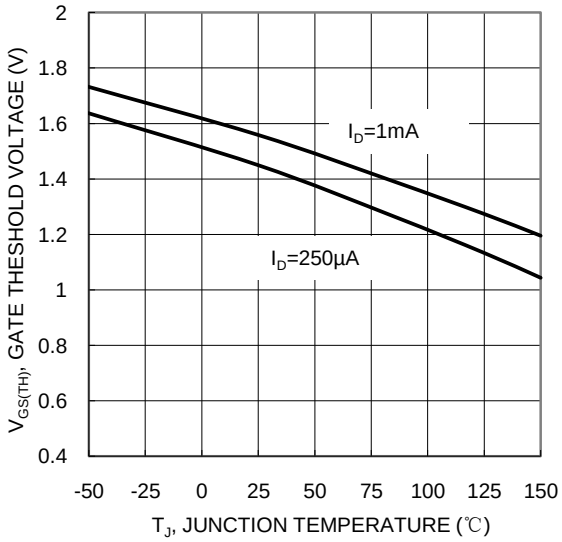

Figure 8. Gate Theshold Variation vs. Junction Temperature

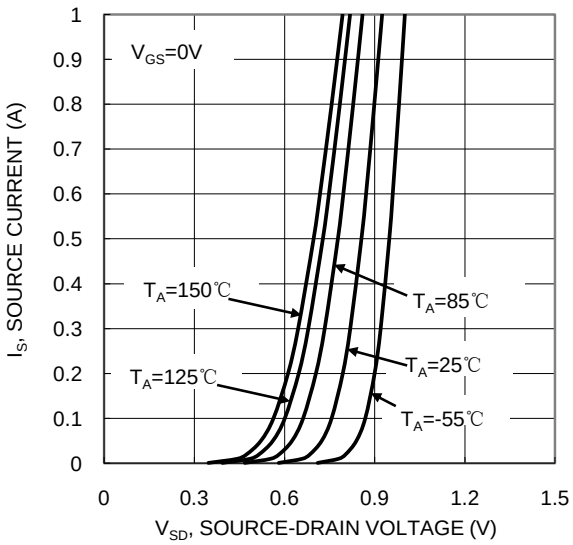

Figure 9. Diode Forward Voltage vs. Current

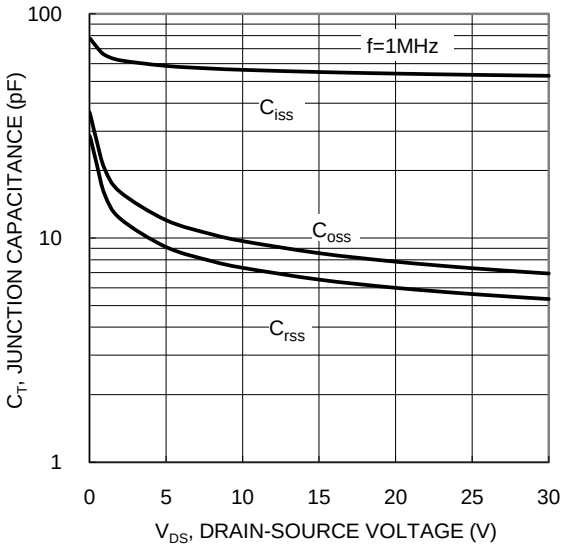

Figure 10. Typical Junction Capacitance

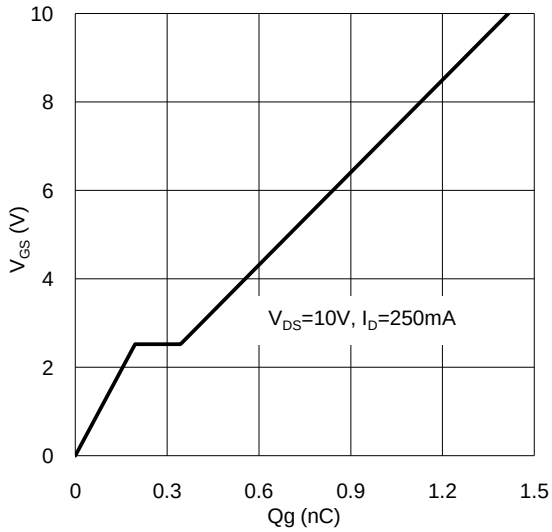

Figure 11. Gate Charge

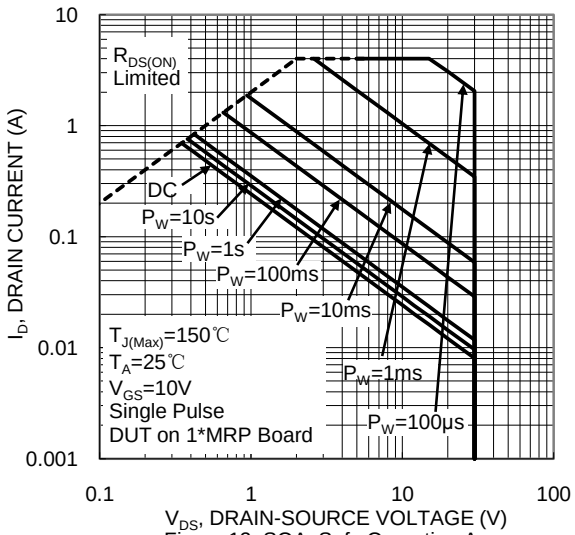

Figure 12. SOA, Safe Operation Area

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Typical Characteristics - P-CHANNEL

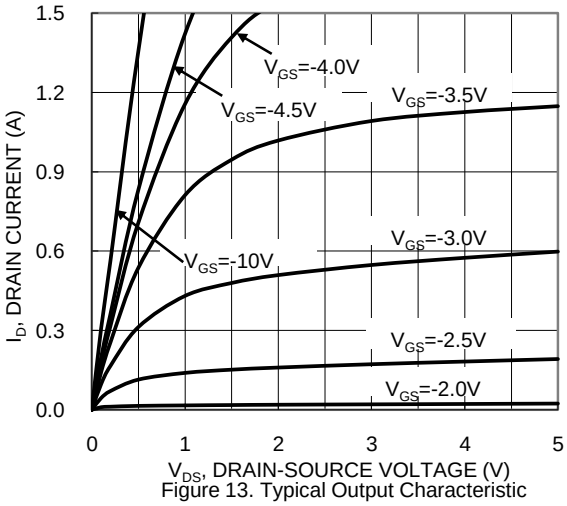

Figure 13. Typical Output Characteristic

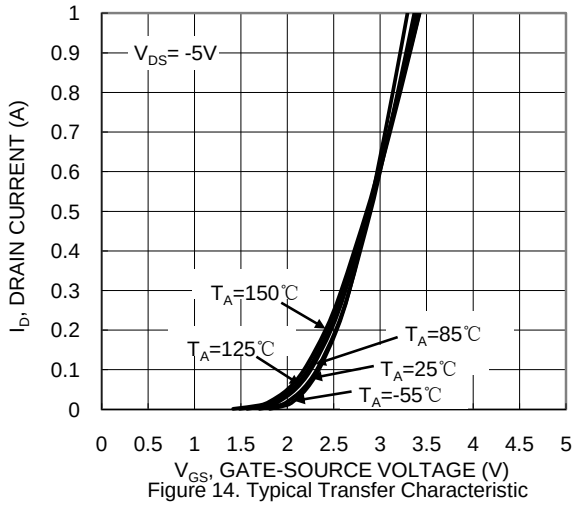

Figure 14. Typical Transfer Characteristic

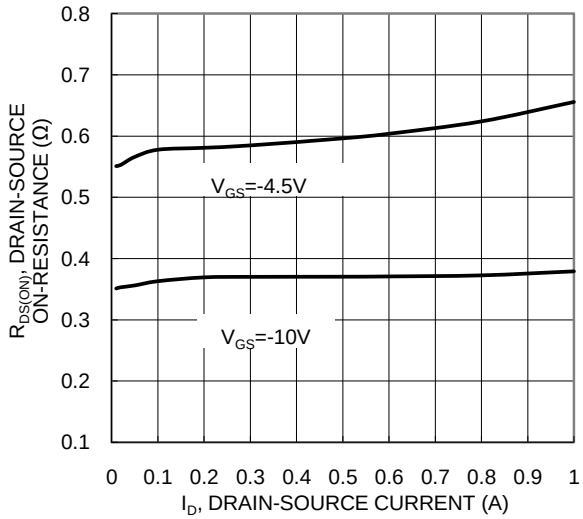

Figure 15. Typical On-Resistance vs. Drain Current and Gate Voltage

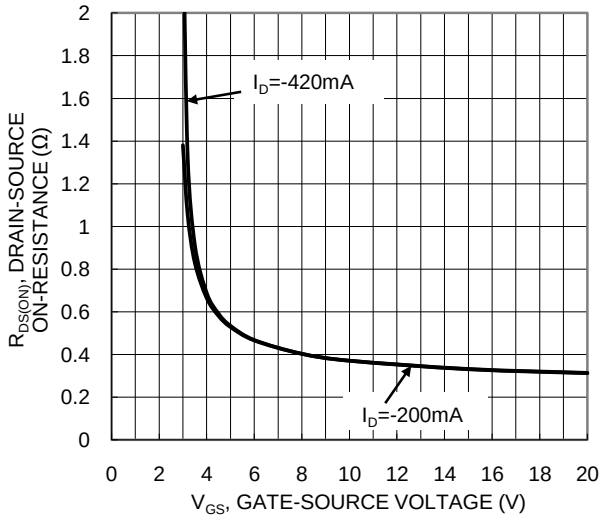

Figure 16. Typical Transfer Characteristic

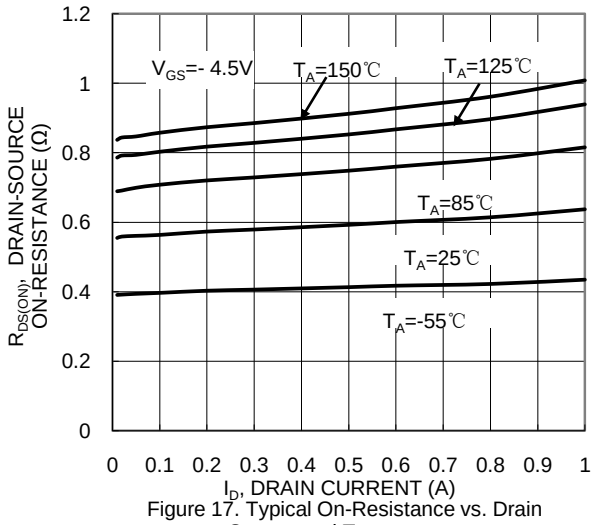

Figure 17. Typical On-Resistance vs. Drain Current and Temperature

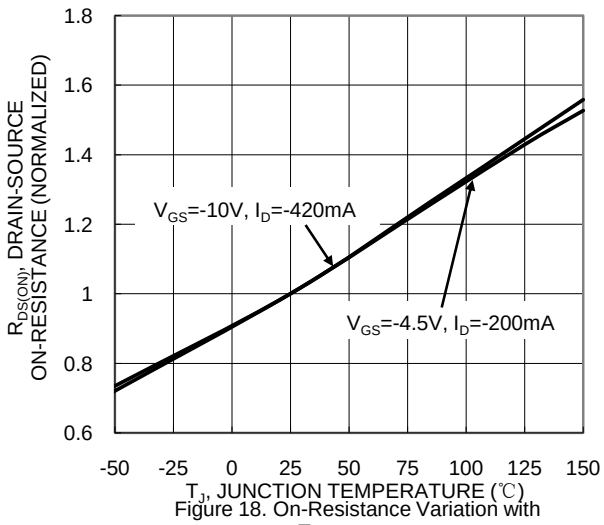

Figure 18. On-Resistance Variation with Temperature

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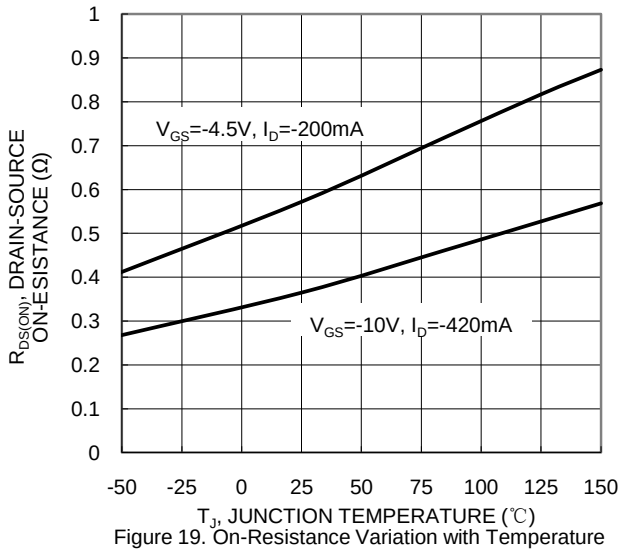

Figure 19. On-Resistance Variation with Temperature

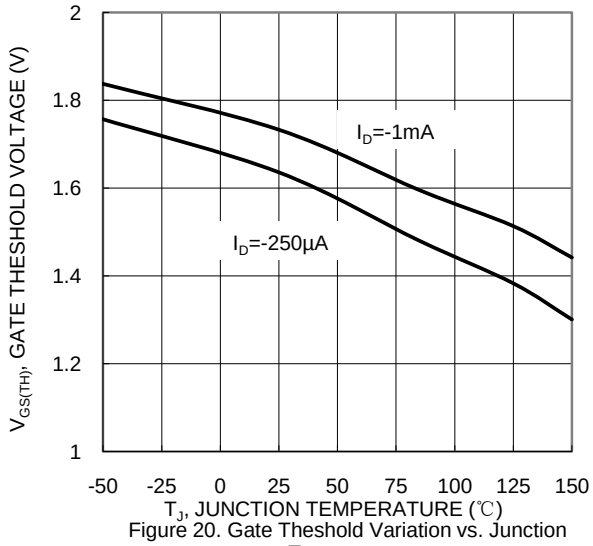

Figure 20. Gate Theshold Variation vs. Junction Temperature

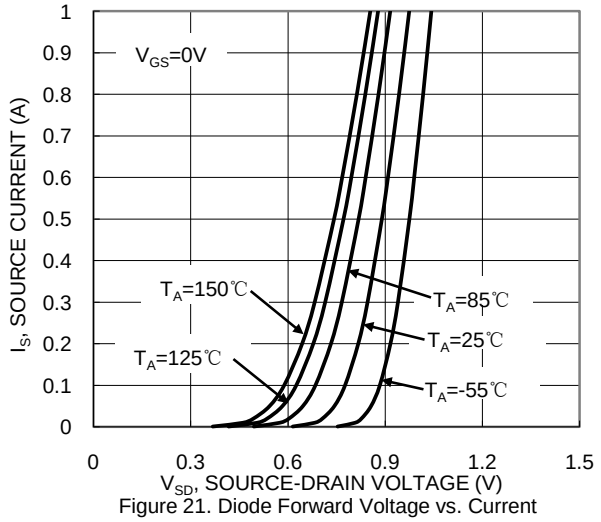

Figure 21. Diode Forward Voltage vs. Current

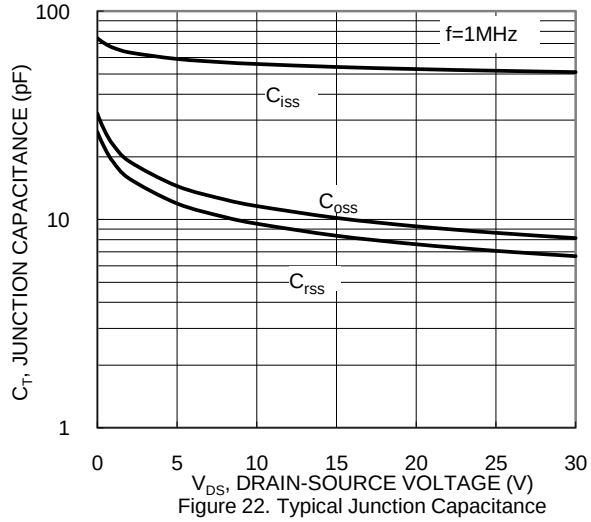

Figure 22. Typical Junction Capacitance

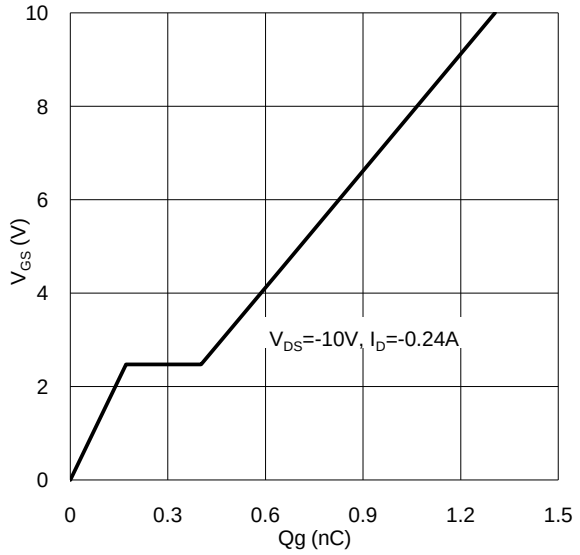

Figure 23. Gate Charge

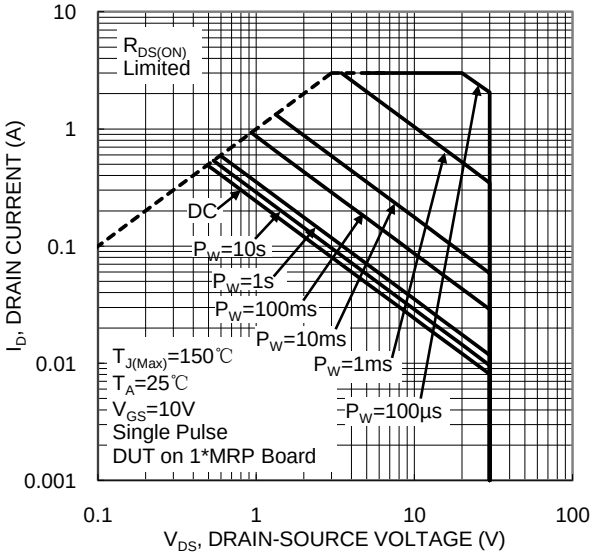

Figure 24. SOA, Safe Operation Area

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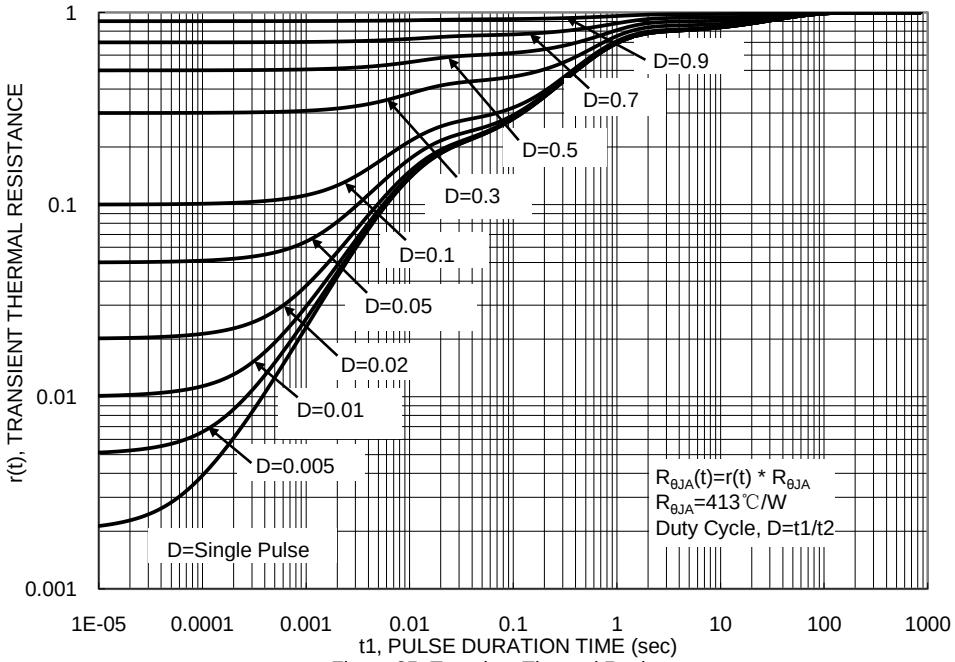
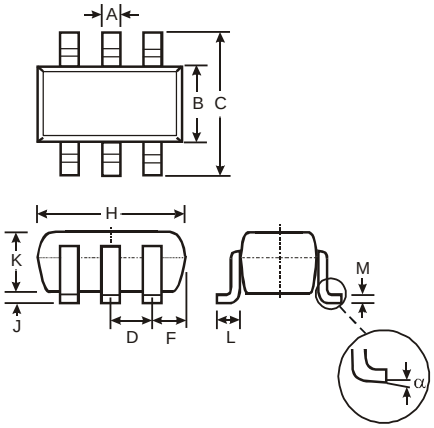


Figure 25. Transient Thermal Resistance

Package Outline Dimensions

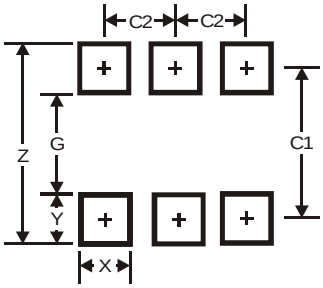
Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf the for latest version.



SOT363			
Dim	Min	Max	Typ
A	0.10	0.30	0.25
B	1.15	1.35	1.30
C	2.00	2.20	2.10
D	0.65 Typ		
F	0.40	0.45	0.425
H	1.80	2.20	2.15
J	0	0.10	0.05
K	0.90	1.00	1.00
L	0.25	0.40	0.30
M	0.10	0.22	0.11
α	0°	8°	-
All Dimensions in mm			

Suggested Pad Layout

Please see AP02001 at http://www.diodes.com/datasheets/ap02001.pdf the for the latest version.



Dimensions	Value (in mm)
Z	2.5
G	1.3
X	0.42
Y	0.6
C1	1.9
C2	0.65

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