

COMPLEMENTARY PAIR ENHANCEMENT MODE MOSFET
Product Summary

Device	BV _{DSS}	R _{DS(ON)} Max	I _D Max T _A = +25°C
Q1	60V	1.7Ω @ V _{GS} = 10V	571mA
		3Ω @ V _{GS} = 4.5V	430mA
Q2	-50V	6Ω @ V _{GS} = -10V	-304mA
		8Ω @ V _{GS} = -5V	-263mA

Description and Applications

This MOSFET is designed to meet the stringent requirements of Automotive applications. It is qualified to AEC-Q101, supported by a PPAP and is ideal for use in:

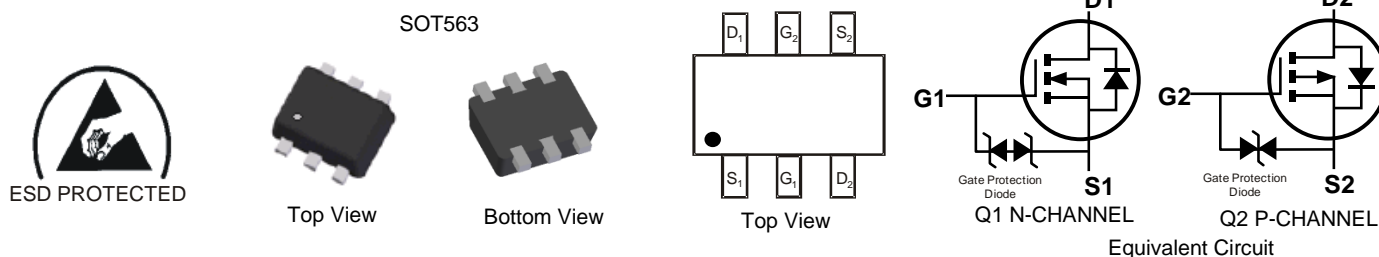
- Power Management Functions
- DC-DC Converters
- Battery

Features and Benefits

- Low On-Resistance
- Low Input Capacitance
- Fast Switching Speed
- Low Input/Output Leakage
- Ultra-Small Surface Mount Package
- **ESD Protected Gate**
- **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

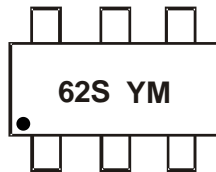
- Case: SOT563
- Case Material: Molded Plastic, "Green" Molding Compound.
UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections: See Diagram
- Terminals: Finish – Matte Tin Annealed over Copper Leadframe.
Solderable per MIL-STD-202, Method 208 (e3)
- Weight: 0.003 grams (Approximate)


Ordering Information (Note 5)

Part Number	Case	Packaging
DMC62D0SVQ-7	SOT563	3,000/Tape & Reel
DMC62D0SVQ-13	SOT563	10,000/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 <https://www.diodes.com/quality/product-compliance-definitions/>.
 5. For packaging details, go to our website at <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

Marking Information



62S = Product Type Marking Code
 YM = Date Code Marking
 Y = Year (ex: E = 2017)
 M = Month (ex: 9 = September)

Date Code Key

Year	2016	2017	2018	2019	2020	2021	2022
Code	D	E	F	G	H	I	J

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

Characteristic			Symbol	Q1_Value	Q2_Value	Unit
Drain-Source Voltage			V _{DSS}	60	-50	V
Gate-Source Voltage			V _{GSS}	±20	±20	V
Continuous Drain Current (Note 7)	Steady State	T _A = +25°C	I _D	571	-304	mA
N-Channel: V _{GS} = 10V P-Channel: V _{GS} = -10V		T _A = +70°C		457	-243	
Pulsed Drain Current (10µs Pulse, Duty Cycle = 1%)			I _{DM}	1,200	-800	mA
Maximum Body Diode Continuous Current (Note 7)			I _S	500	-300	mA

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

Characteristic		Symbol	Value	Unit
Total Power Dissipation (Note 6)		P _D	0.51	W
Thermal Resistance, Junction to Ambient (Note 6)	Steady State	R _{θJA}	250	°C/W
Total Power Dissipation (Note 7)		P _D	0.84	W
Thermal Resistance, Junction to Ambient (Note 7)	Steady State	R _{θJA}	150	°C/W
Operating and Storage Temperature Range		T _J , T _{STG}	-55 to +150	°C

Notes: 6. Device mounted on FR-4 substrate PC board, 2oz copper, with minimum recommended pad layout.
 7. Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper plate.

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 8)						
Drain-Source Breakdown Voltage	BV _{DSS}	60	—	—	V	V _{GS} = 0V, I _D = 250μA
Zero Gate Voltage Drain Current	I _{DSS}	—	—	1	μA	V _{DS} = 60V, V _{GS} = 0V
Gate-Source Leakage	I _{GSS}	—	—	±10	μA	V _{GS} = ±20V, V _{DS} = 0V
ON CHARACTERISTICS (Note 8)						
Gate Threshold Voltage	V _{GS(TH)}	1.0	—	2.5	V	V _{DS} = V _{GS} , I _D = 250μA
Static Drain-Source On-Resistance	R _{DS(ON)}	—	—	1.7	Ω	V _{GS} = 10V, I _D = 500mA
		—	—	3		V _{GS} = 4.5V, I _D = 200mA
Diode Forward Voltage	V _{SD}	—	—	1.4	V	V _{GS} = 0V, I _S = 115mA
DYNAMIC CHARACTERISTICS (Note 9)						
Input Capacitance	C _{iss}	—	30	—	pF	V _{DS} = 25V, V _{GS} = 0V, f = 1.0MHz
Output Capacitance	C _{oss}	—	4.2	—	pF	
Reverse Transfer Capacitance	C _{rss}	—	2.9	—	pF	
Total Gate Charge	Q _g	—	0.4	—	nC	V _{GS} = 4.5V, V _{DS} = 10V, I _D = 250mA
Gate-Source Charge	Q _{gs}	—	0.15	—	nC	
Gate-Drain Charge	Q _{gd}	—	0.09	—	nC	
Turn-On Delay Time	t _{D(ON)}	—	4.3	—	ns	V _{DD} = 30V, V _{GS} = 10V, R _g = 25Ω, I _D = 200mA
Turn-On Rise Time	t _R	—	2.7	—	ns	
Turn-Off Delay Time	t _{D(OFF)}	—	15.1	—	ns	
Turn-Off Fall Time	t _F	—	6.5	—	ns	

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 8)						
Drain-Source Breakdown Voltage	BV _{DSS}	-50	—	—	V	V _{GS} = 0V, I _D = -250μA
Zero Gate Voltage Drain Current	I _{DSS}	—	—	-1	μA	V _{DS} = -50V, V _{GS} = 0V
Gate-Source Leakage	I _{GSS}	—	—	±10	μA	V _{GS} = ±16V, V _{DS} = 0V
ON CHARACTERISTICS (Note 8)						
Gate Threshold Voltage	V _{GS(TH)}	-1	—	-2.5	V	V _{DS} = V _{GS} , I _D = -250μA
Static Drain-Source On-Resistance	R _{DS(ON)}	—	—	6	Ω	V _{GS} = -10V, I _D = -500mA
		—	—	8		V _{GS} = -5V, I _D = -200mA
Diode Forward Voltage	V _{SD}	—	—	-1.4	V	V _{GS} = 0V, I _S = -115mA
DYNAMIC CHARACTERISTICS (Note 9)						
Input Capacitance	C _{iss}	—	26	—	pF	V _{DS} = -25V, V _{GS} = 0V, f = 1.0MHz
Output Capacitance	C _{oss}	—	4.2	—	pF	
Reverse Transfer Capacitance	C _{rss}	—	2.4	—	pF	
Total Gate Charge	Q _g	—	0.3	—	nC	V _{GS} = -4.5V, V _{DS} = -10V, I _D = -500mA
Gate-Source Charge	Q _{gs}	—	0.14	—	nC	
Gate-Drain Charge	Q _{gd}	—	0.12	—	nC	
Turn-On Delay Time	t _{D(ON)}	—	4.1	—	ns	V _{DD} = -30V, V _{GS} = -10V, R _g = 50Ω, I _D = -270mA
Turn-On Rise Time	t _R	—	2.8	—	ns	
Turn-Off Delay Time	t _{D(OFF)}	—	20.2	—	ns	
Turn-Off Fall Time	t _F	—	9.15	—	ns	

Notes: 8. Short duration pulse test used to minimize self-heating effect.
9. Guaranteed by design. Not subject to product testing.

Typical Characteristics - N-CHANNEL

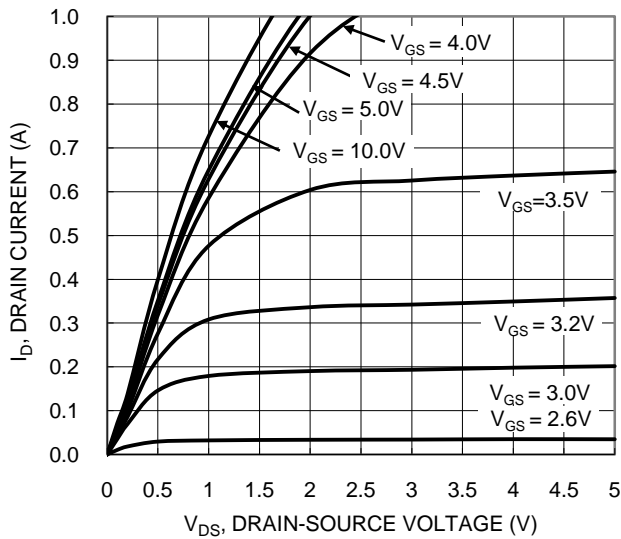


Figure 1. Typical Output Characteristic

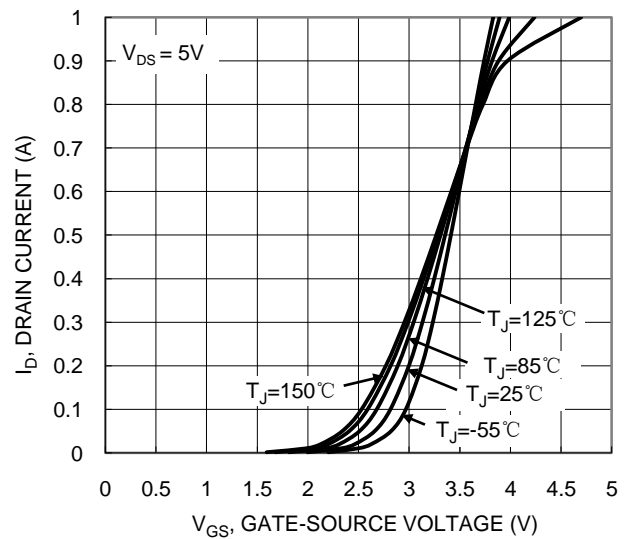


Figure 2. Typical Transfer Characteristic

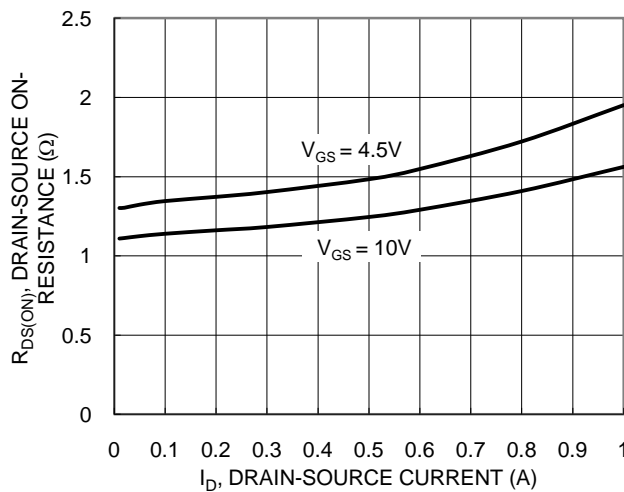


Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage

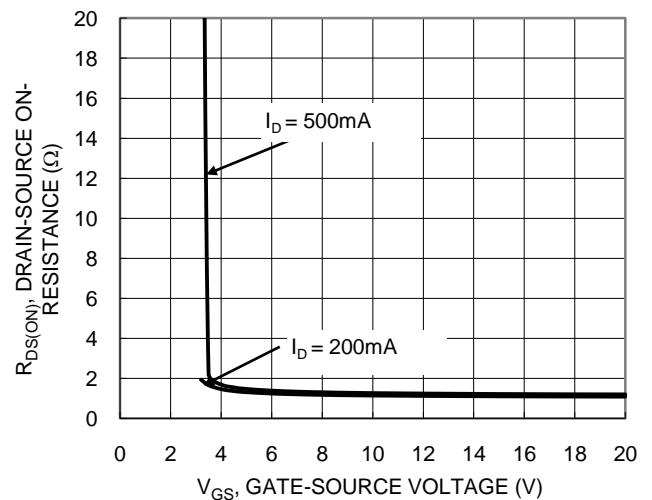


Figure 4. Typical Transfer Characteristic

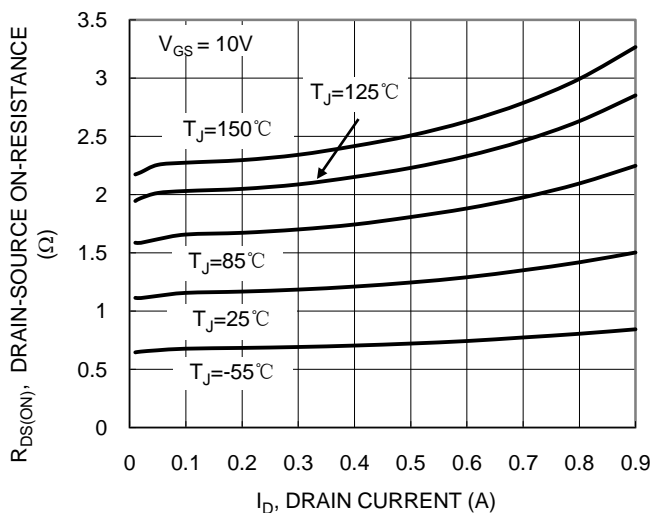


Figure 5. Typical On-Resistance vs. Drain Current and Temperature

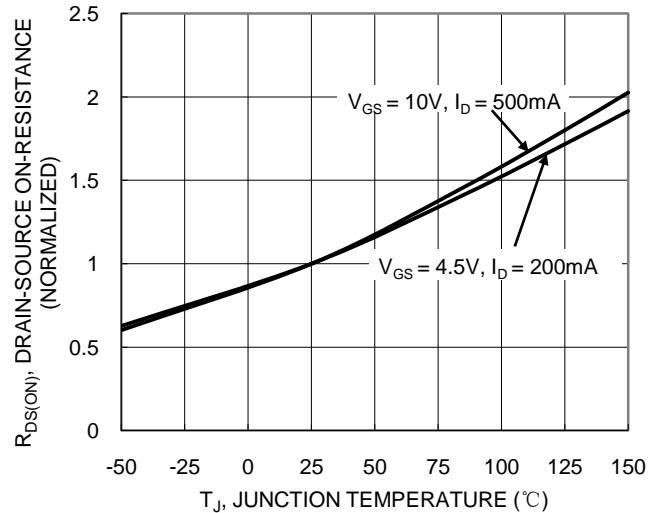
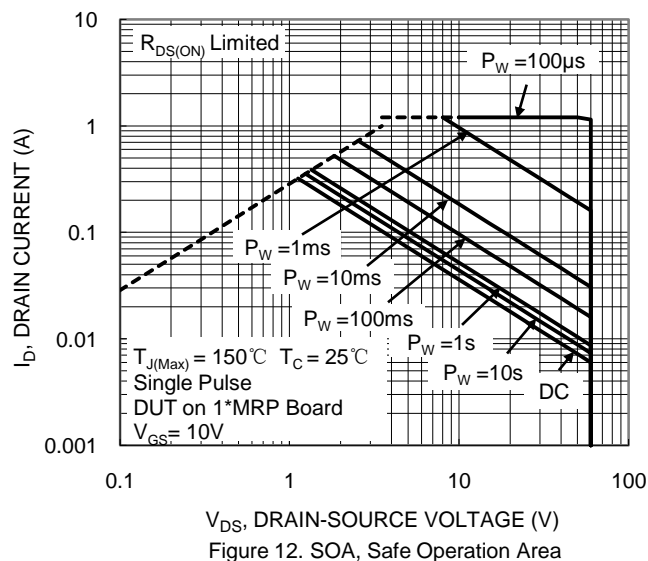
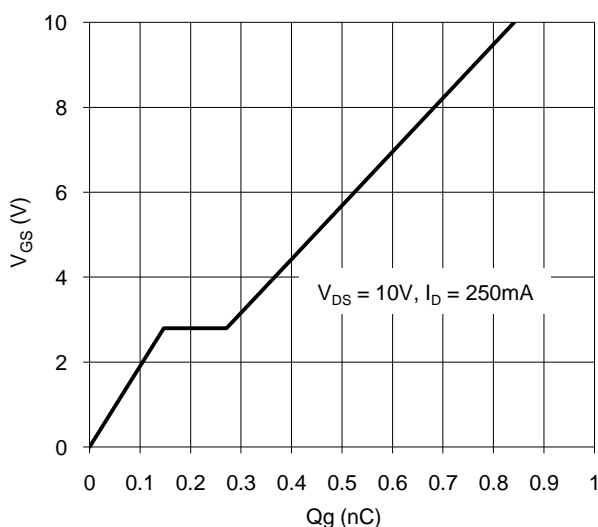
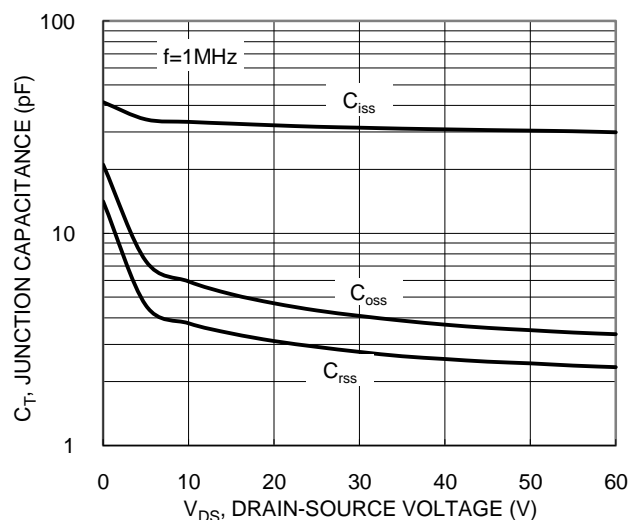
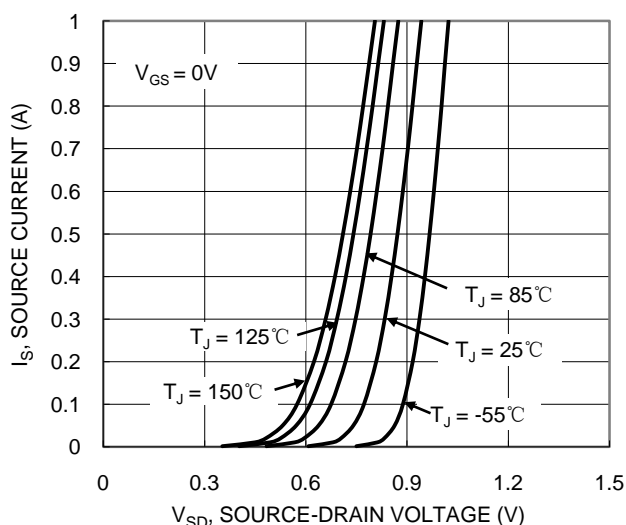
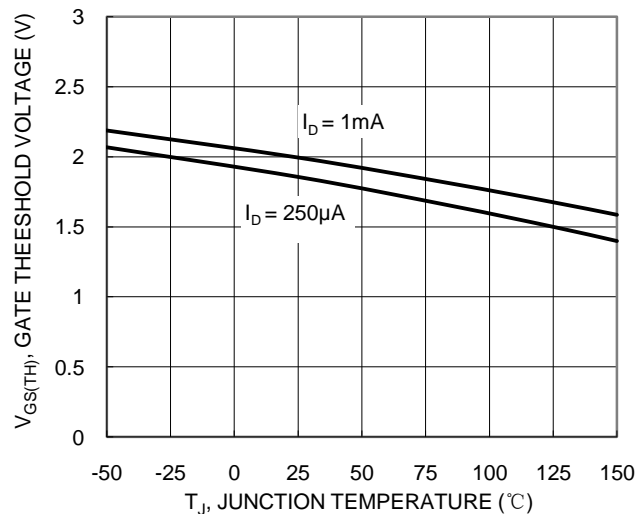
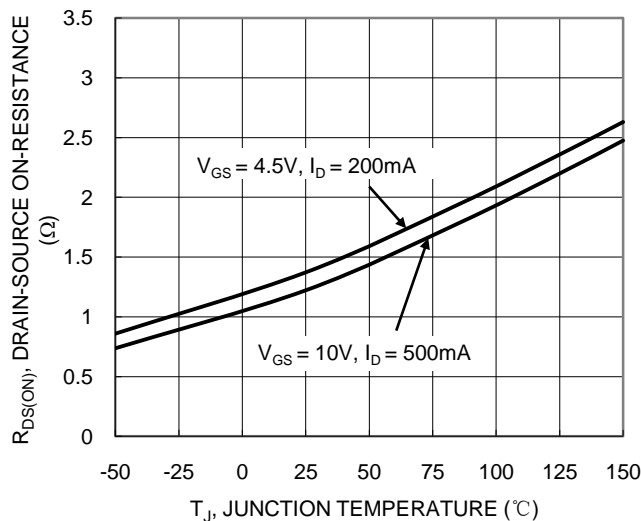


Figure 6. On-Resistance Variation with Temperature

Typical Characteristics - N-CHANNEL (Cont.)



Typical Characteristics - P-CHANNEL

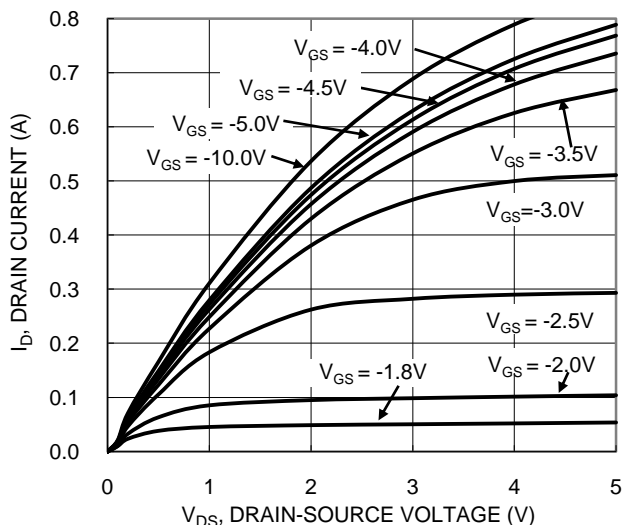


Figure 13. Typical Output Characteristic

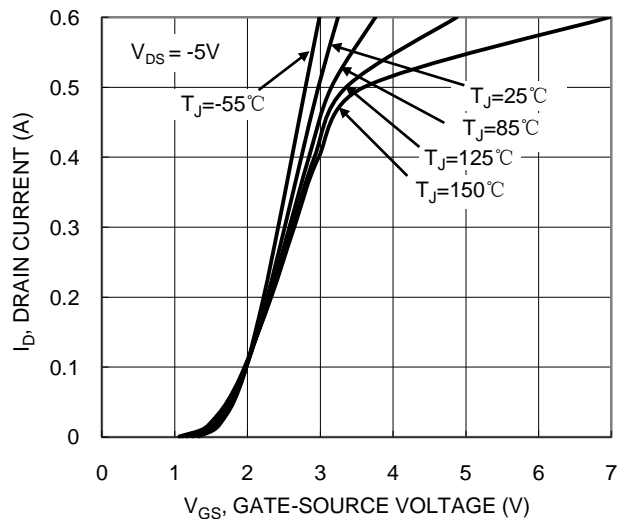


Figure 14. Typical Transfer Characteristic

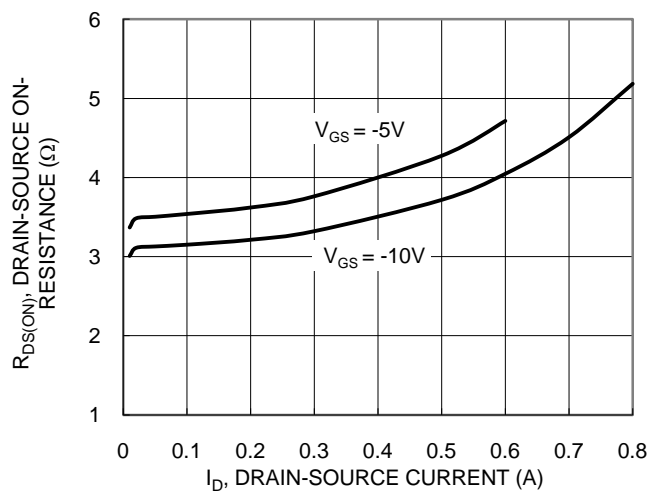


Figure 15. Typical On-Resistance vs. Drain Current and Gate Voltage

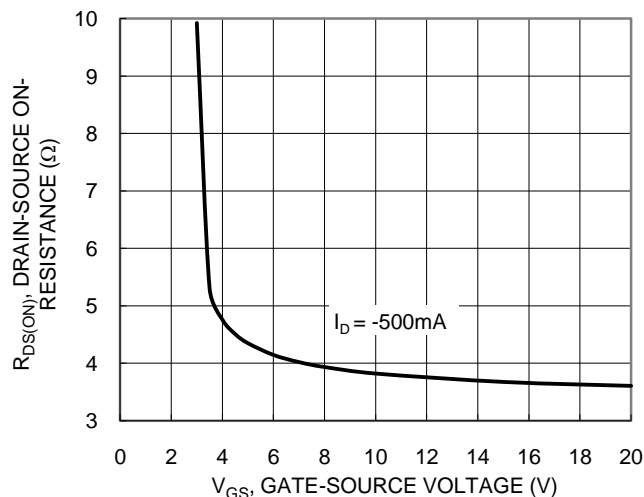


Figure 16. Typical Transfer Characteristic

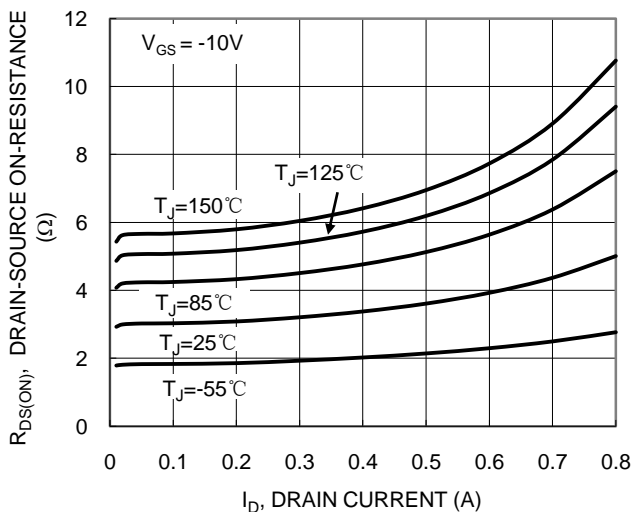


Figure 17. Typical On-Resistance vs. Drain Current and Temperature

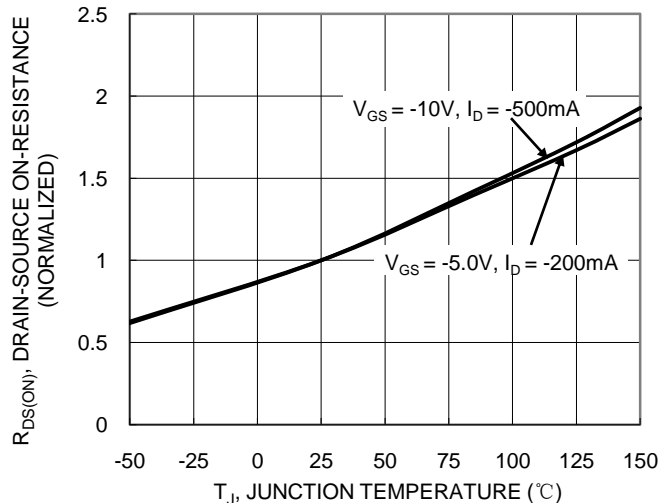


Figure 18. On-Resistance Variation with Temperature

Typical Characteristics - P-CHANNEL (Cont.)

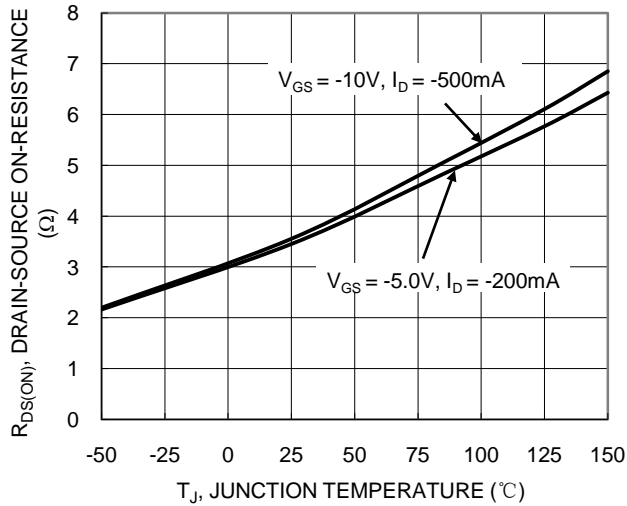


Figure 19. On-Resistance Variation with Temperature

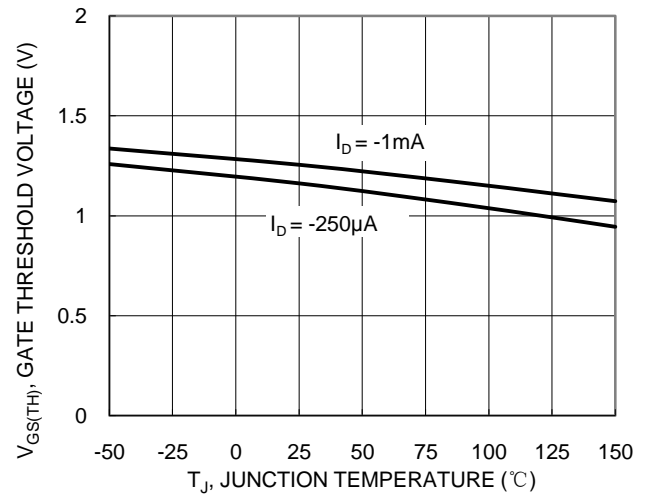


Figure 20. Gate Threshold Variation vs. Junction Temperature

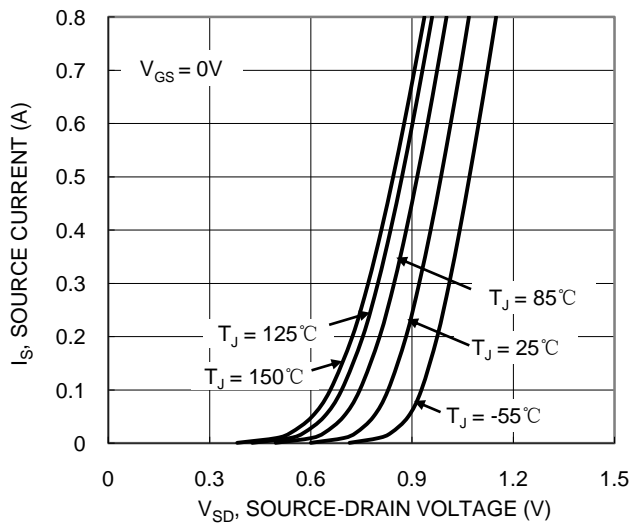


Figure 21. Diode Forward Voltage vs. Current

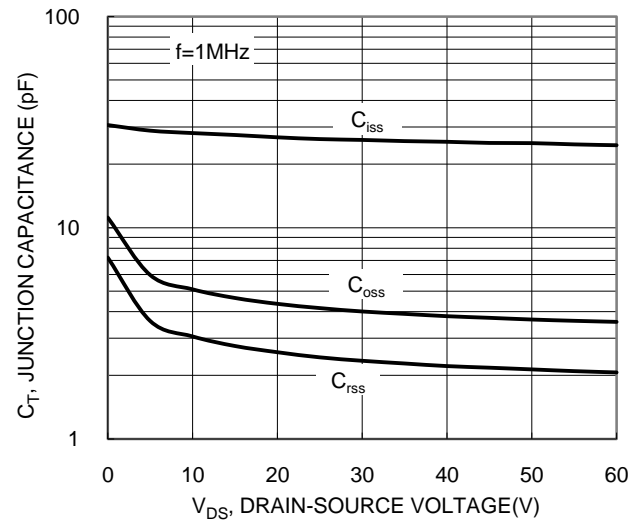


Figure 22. Typical Junction Capacitance

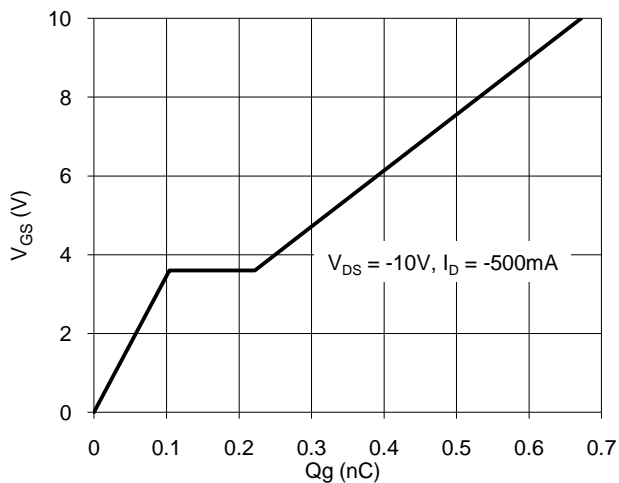


Figure 23. Gate Charge

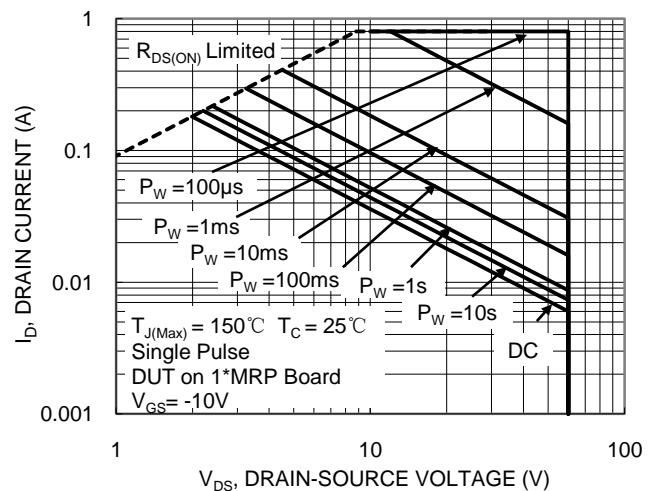


Figure 24. SOA, Safe Operation Area

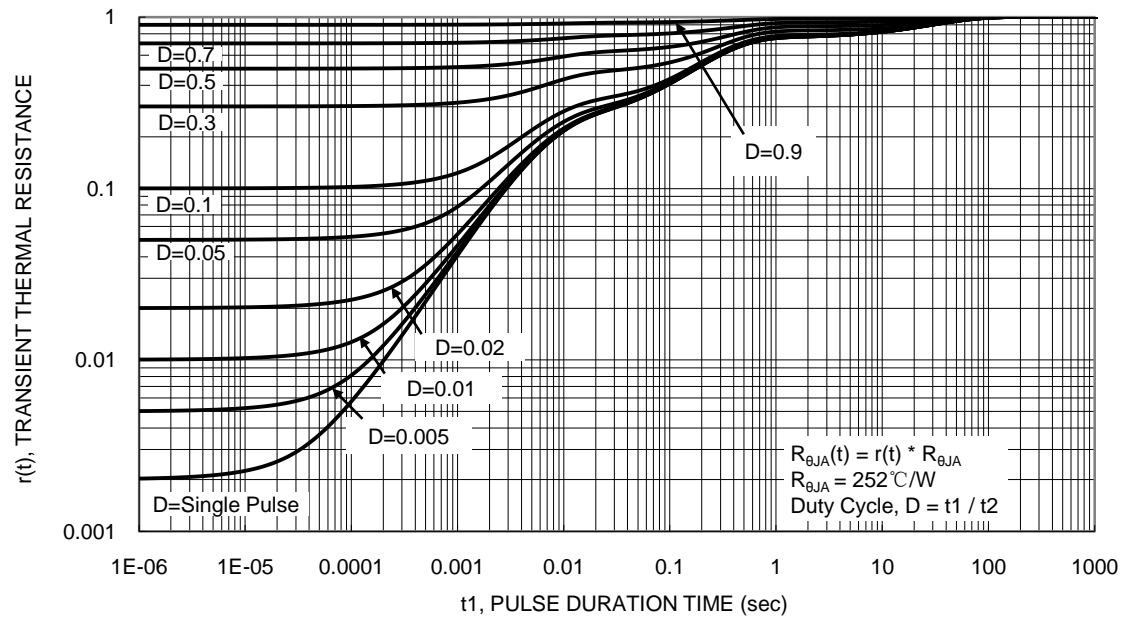
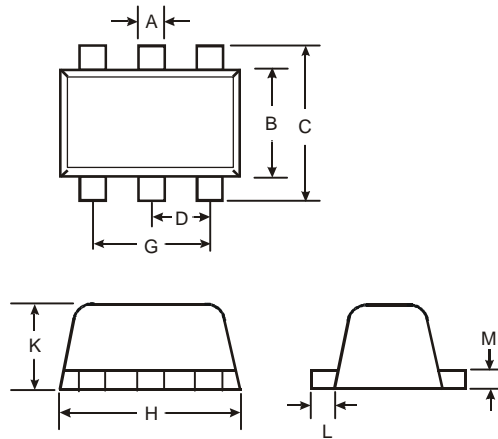


Figure 25. Transient Thermal Resistance

Package Outline Dimensions

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

SOT563

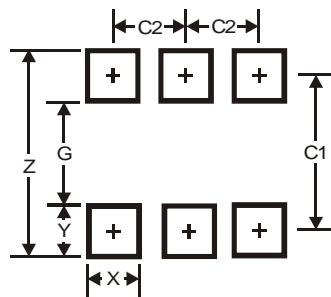


SOT563			
Dim	Min	Max	Typ
A	0.15	0.30	0.20
B	1.10	1.25	1.20
C	1.55	1.70	1.60
D	-	-	0.50
G	0.90	1.10	1.00
H	1.50	1.70	1.60
K	0.55	0.60	0.60
L	0.10	0.30	0.20
M	0.10	0.18	0.11
All Dimensions in mm			

Suggested Pad Layout

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

SOT563



Dimensions	Value (in mm)
Z	2.2
G	1.2
X	0.375
Y	0.5
C1	1.7
C2	0.5

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