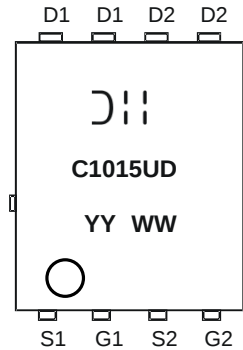


Marking Information



⌋|| = Manufacturer's Marking
 C1015UD = Product Type Marking Code
 YYWW = Date Code Marking
 YY = Year (ex: 16 = 2016)
 WW = Week (01 to 53)

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

Characteristic			Symbol	Q1 Value	Q2 Value	Unit
Drain-Source Voltage			V _{DSS}	12	-20	V
Gate-Source Voltage			V _{GSS}	±8	±8	V
Continuous Drain Current (Note 5) V _{GS} = 4.5V	Steady State	T _A = +25°C T _A = +70°C	I _D	9.5 7.6	-6.8 -5.4	A
	t < 10s	T _A = +25°C T _A = +70°C	I _D	13.0 10.4	-9.4 -7.5	A
Maximum Body Diode Forward Current (Note 5)			I _S	2.4	-2.2	A
Pulsed Drain Current (10μs Pulse, Duty Cycle = 1%)			I _{DM}	65	-35	A
Avalanche Current (Note 6) L = 0.1mH			I _{AS}	22	-20	A
Avalanche Energy (Note 6) L = 0.1mH			E _{AS}	25	20	mJ

Thermal Characteristics

Characteristic		Symbol	Value	Units
Total Power Dissipation (Note 5)	T _A = +25°C	P _D	2.3	W
	T _A = +70°C		1.5	
Thermal Resistance, Junction to Ambient (Note 5)	Steady State	R _{θJA}	56	°C/W
	t < 10s		29	
Thermal Resistance, Junction to Case		R _{θJC}	5.4	
Operating and Storage Temperature Range		T _J , T _{STG}	-55 to +150	°C

Notes: 5. Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper plate.
 6. I_{AS} and E_{AS} ratings are based on low frequency and duty cycles to keep T_J = +25°C.

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

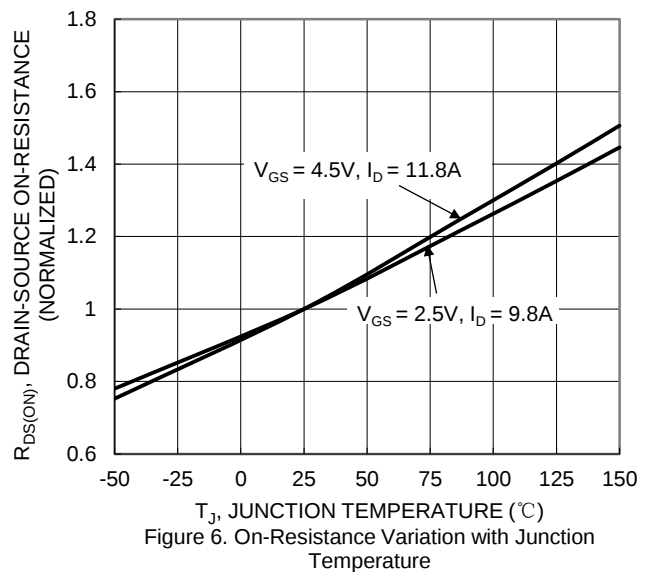
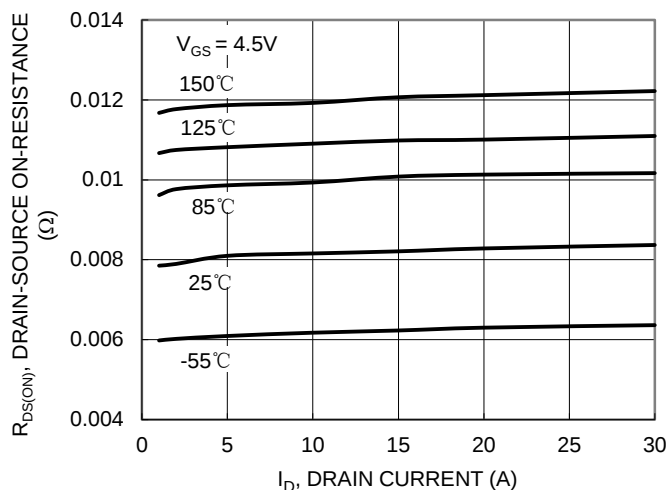
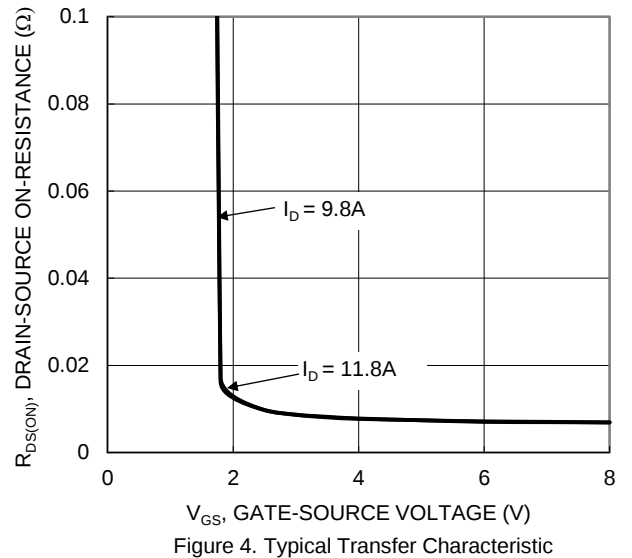
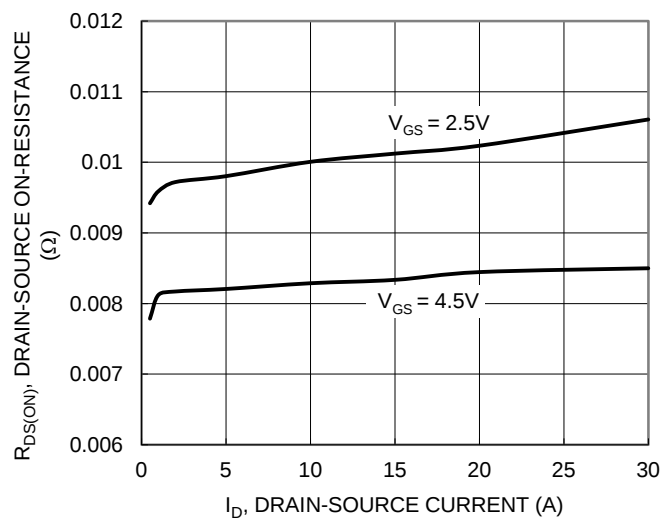
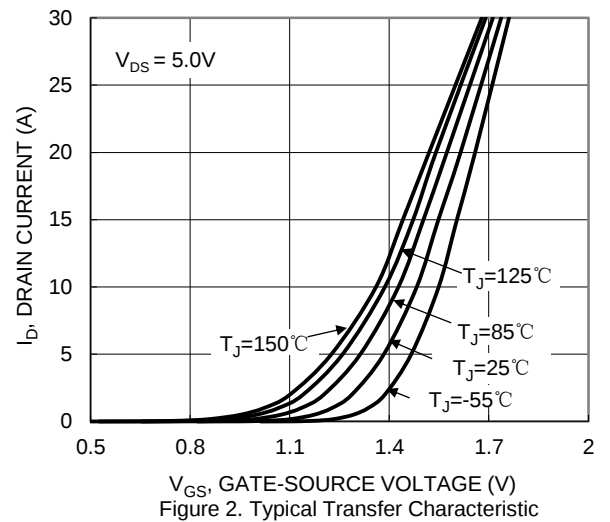
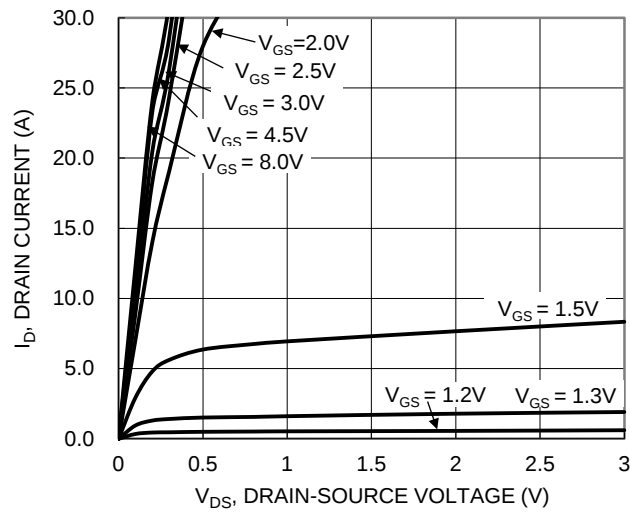
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 7)						
Drain-Source Breakdown Voltage	BV _{DSS}	12	—	—	V	V _{GS} = 0V, I _D = 250μA
Zero Gate Voltage Drain Current	I _{DSS}	—	—	1	μA	V _{DS} = 12V, V _{GS} = 0V
Gate-Source Leakage	I _{GSS}	—	—	±100	nA	V _{GS} = ±8V, V _{DS} = 0V
ON CHARACTERISTICS (Note 7)						
Gate Threshold Voltage	V _{GS(TH)}	0.6	0.8	1.5	V	V _{DS} = V _{GS} , I _D = 250μA
Static Drain-Source On-Resistance	R _{DS(ON)}	—	9.6	17	mΩ	V _{GS} = 4.5V, I _D = 11.8A
		—	11	25		V _{GS} = 2.5V, I _D = 9.8A
Diode Forward Voltage	V _{SD}	—	0.7	1.2	V	V _{GS} = 0V, I _S = 2.9A
DYNAMIC CHARACTERISTICS (Note 8)						
Input Capacitance	C _{iss}	—	1495	—	pF	V _{DS} = 6V, V _{GS} = 0V, f = 1.0MHz
Output Capacitance	C _{oss}	—	310	—		
Reverse Transfer Capacitance	C _{rss}	—	285	—		
Gate Resistance	R _g	—	1.6	—	Ω	V _{DS} = 0V, V _{GS} = 0V, f = 1.0MHz
Total Gate Charge (V _{GS} = 3.3V)	Q _g	—	11.5	—	nC	V _{DS} = 6V, I _D = 11.8A
Total Gate Charge (V _{GS} = 4.5V)	Q _g	—	15.6	—		
Gate-Source Charge	Q _{gs}	—	2.3	—		
Gate-Drain Charge	Q _{gd}	—	4.6	—		
Turn-On Delay Time	t _{D(ON)}	—	5.7	—	nS	V _{DD} = 6V, R _L = 6Ω V _{GS} = 4.5V, R _g = 6Ω, I _D = 1A
Turn-On Rise Time	t _r	—	10.1	—		
Turn-Off Delay Time	t _{D(OFF)}	—	40.4	—		
Turn-Off Fall Time	t _f	—	22.5	—		
Body Diode Reverse Recovery Time	t _{RR}	—	16.4	—	nS	I _F = 2.9, di/dt = 100A/μs
Body Diode Reverse Recovery Charge	Q _{RR}	—	3.2	—	nC	I _F = 2.9A, di/dt = 100A/μs

Electrical Characteristics Q2 P-Channel (@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}	—	—	±100	nA	V _{GS} = ±8V, V _{DS} = 0V
ON CHARACTERISTICS (Note 7)						
Gate Threshold Voltage	V _{GS(TH)}	-0.6	-0.8	-1.5	V	V _{DS} = V _{GS} , I _D = -250μA
Static Drain-Source On-Resistance	R _{DS(ON)}	—	25	35	mΩ	V _{GS} = -4.5V, I _D = -8.9A
		—	34	55		V _{GS} = -2.5V, I _D = -6.9A
Diode Forward Voltage	V _{SD}	—	-0.8	-1.2	V	V _{GS} = 0V, I _S = -2.9A
DYNAMIC CHARACTERISTICS (Note 8)						
Input Capacitance	C _{iss}	—	1745	—	pF	V _{DS} = -10V, V _{GS} = 0V, f = 1.0MHz
Output Capacitance	C _{oss}	—	146	—		
Reverse Transfer Capacitance	C _{rss}	—	119	—		
Gate Resistance	R _g	—	7.5	—	Ω	V _{DS} = 0V, V _{GS} = 0V, f = 1.0MHz
Total Gate Charge (V _{GS} = -3.3V)	Q _g	—	11.2	—	nC	V _{DS} = -6V, I _D = -8.9A
Total Gate Charge (V _{GS} = -4.5V)	Q _g	—	15.4	—		
Gate-Source Charge	Q _{gs}	—	1.9	—		
Gate-Drain Charge	Q _{gd}	—	2.9	—		
Turn-On Delay Time	t _{D(ON)}	—	7.4	—	nS	V _{DD} = -6V, R _g = 6Ω V _{GS} = -4.5V, I _D = -1A
Turn-On Rise Time	t _r	—	6.2	—		
Turn-Off Delay Time	t _{D(OFF)}	—	60.1	—		
Turn-Off Fall Time	t _f	—	16.3	—		
Body Diode Reverse Recovery Time	t _{RR}	—	9.2	—	nS	I _F = -2.9A, di/dt = -100A/μs
Body Diode Reverse Recovery Charge	Q _{RR}	—	2.8	—	nC	I _F = -2.9A, di/dt = -100A/μs

Notes: 7. Short duration pulse test used to minimize self-heating effect.
8. Guaranteed by design. Not subject to product testing.

Typical Characteristics - N-CHANNEL



Typical Characteristics - N-CHANNEL (continued)

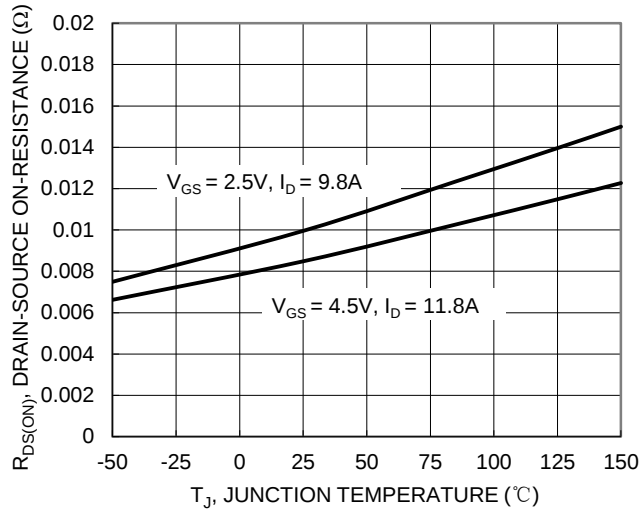


Figure 7. On-Resistance Variation with Junction Temperature

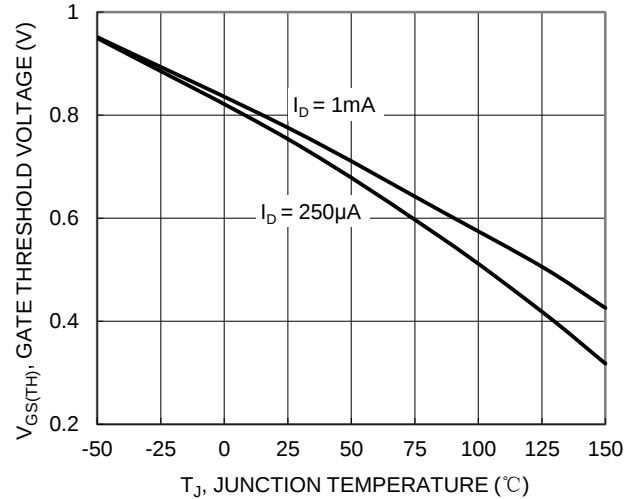


Figure 8. Gate Threshold Variation vs. Junction Temperature

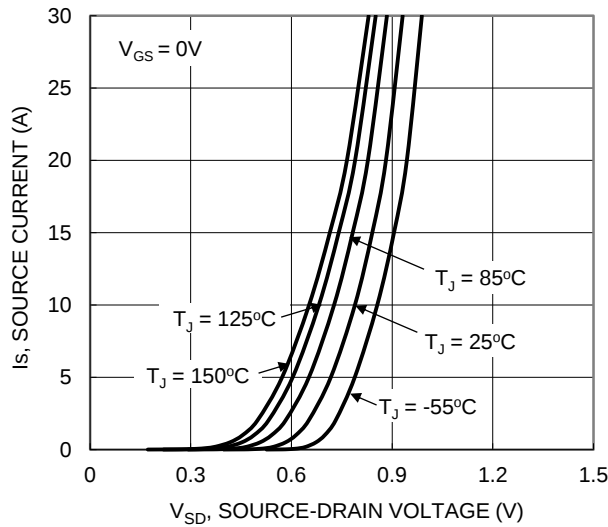


Figure 9. Diode Forward Voltage vs. Current

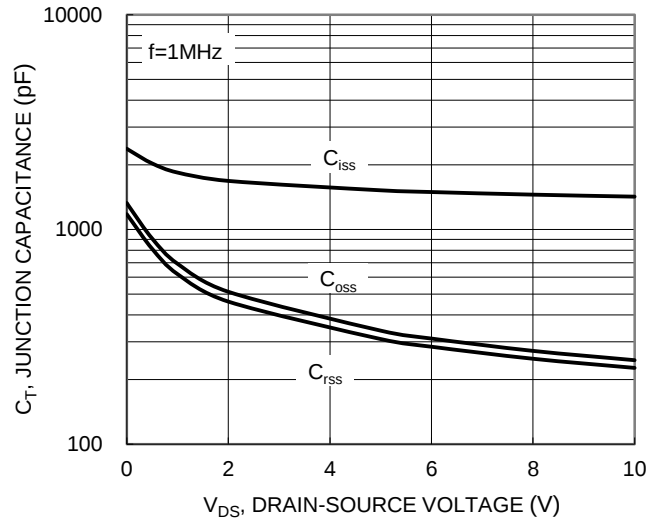


Figure 10. Typical Junction Capacitance

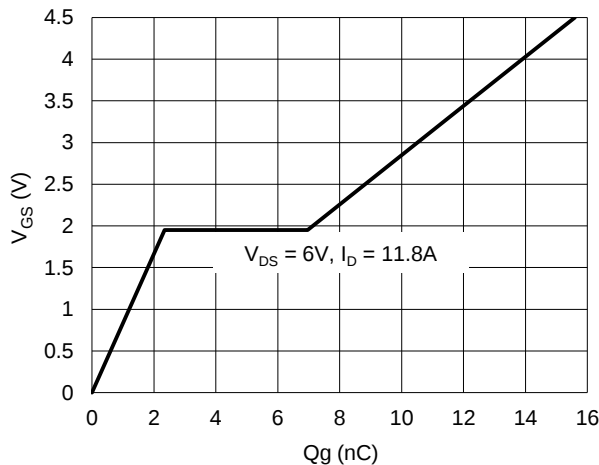


Figure 11. Gate Charge

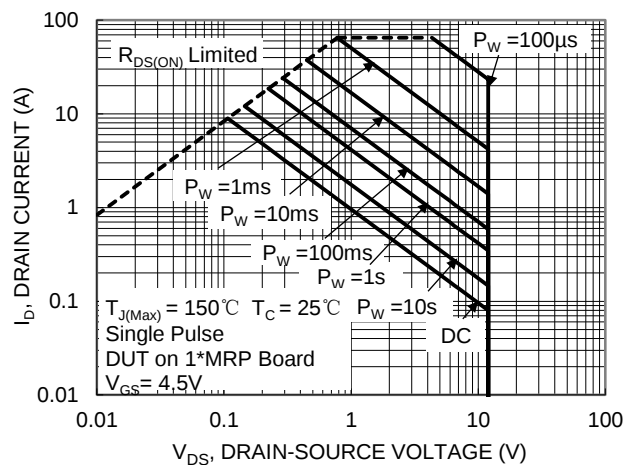


Figure 12. SOA, Safe Operation Area

Typical Characteristics - P-CHANNEL

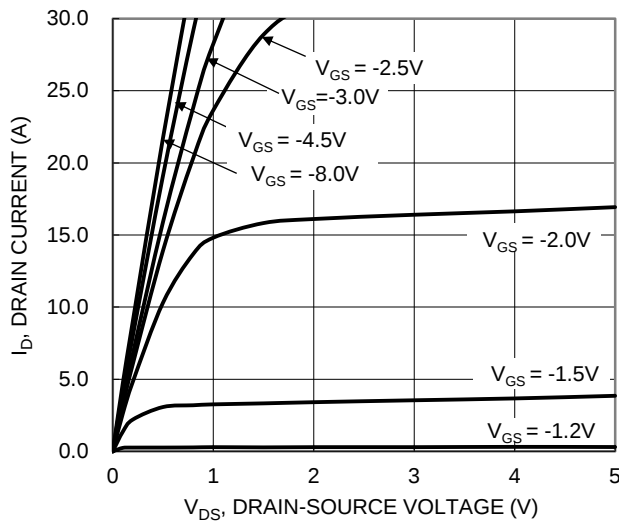


Figure 13. Typical Output Characteristic

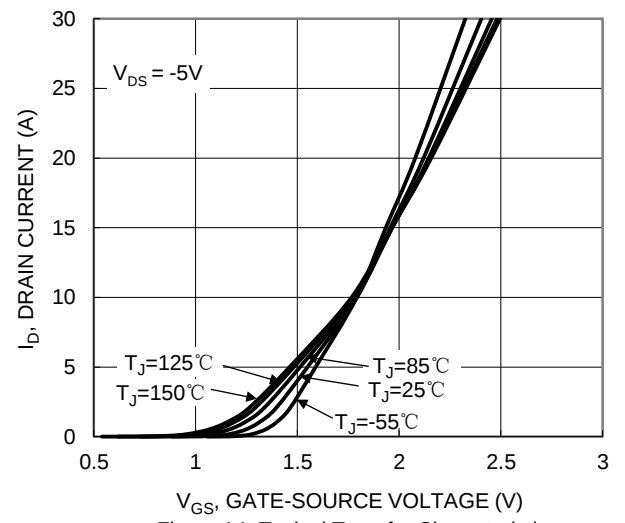


Figure 14. Typical Transfer Characteristic

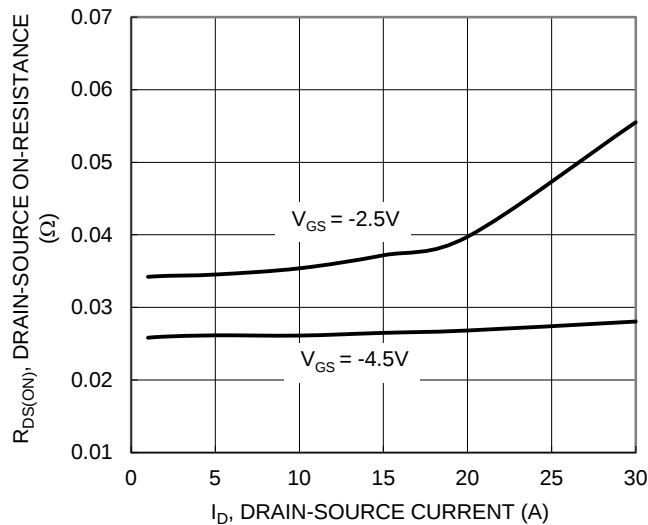


Figure 15. Typical On-Resistance vs. Drain Current and Gate Voltage

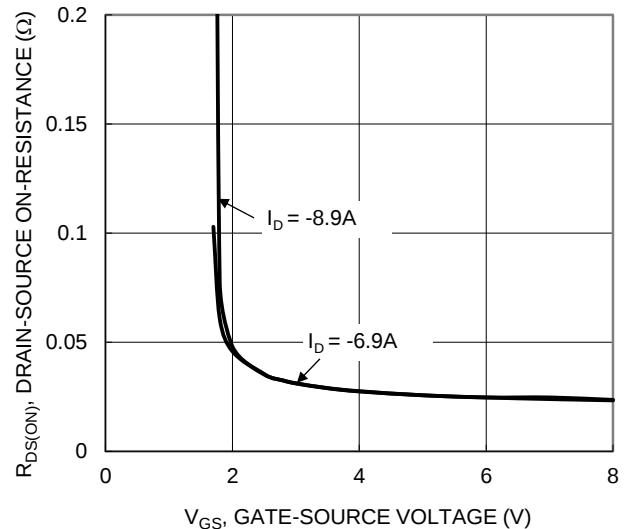


Figure 16. Typical Transfer Characteristic

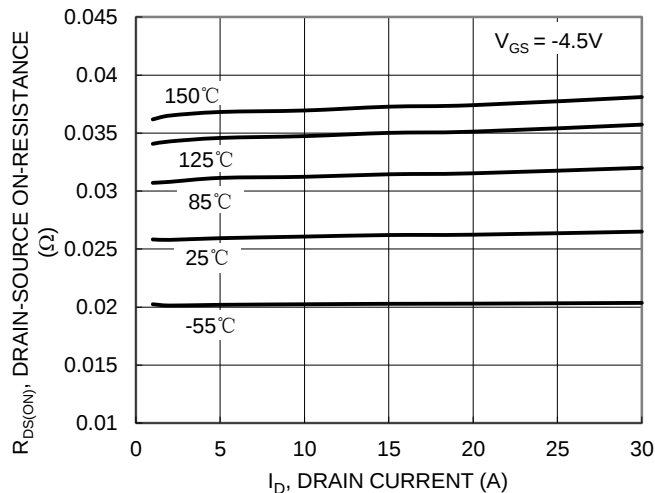


Figure 17. Typical On-Resistance vs. Drain Current and Junction Temperature

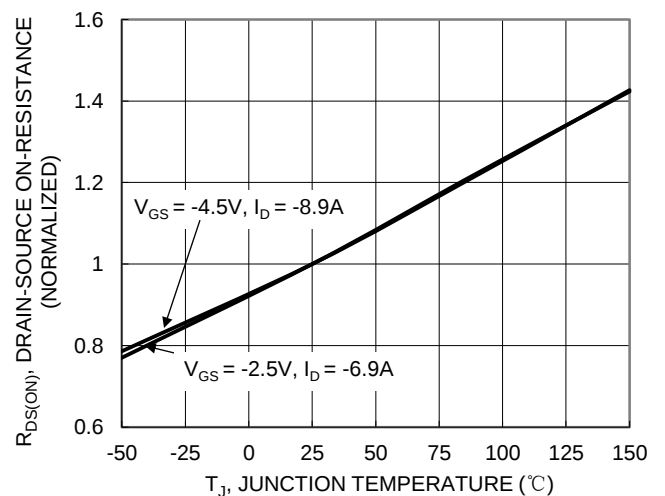


Figure 18. On-Resistance Variation with Junction Temperature

Typical Characteristics - P-CHANNEL (continued)

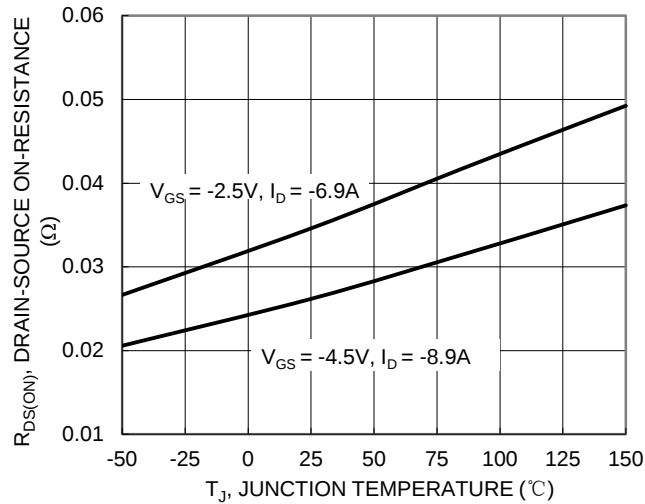


Figure 19. On-Resistance Variation with Junction Temperature

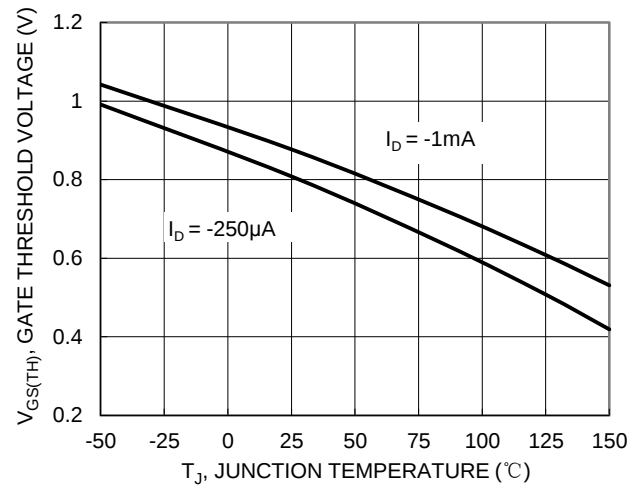


Figure 20. Gate Threshold Variation vs. Junction Temperature

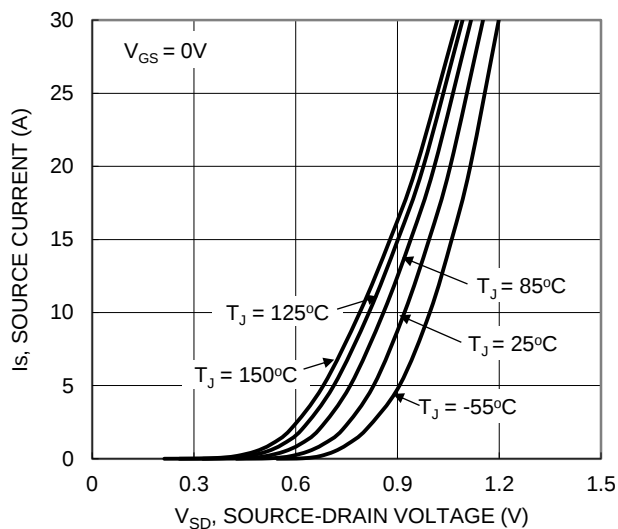


Figure 21. Diode Forward Voltage vs. Current

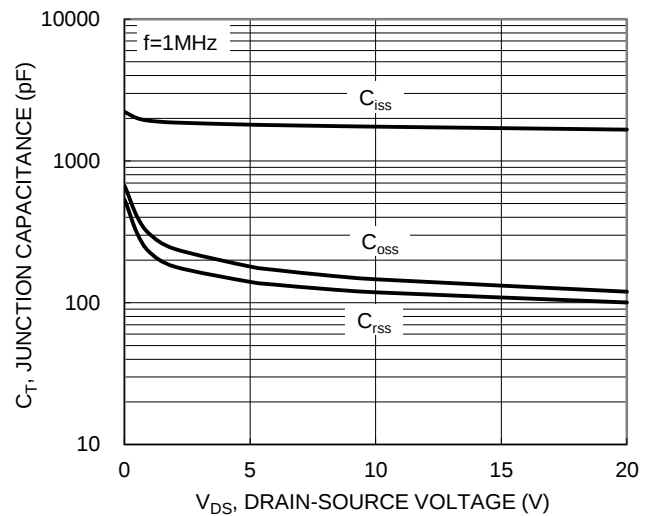


Figure 22. Typical Junction Capacitance

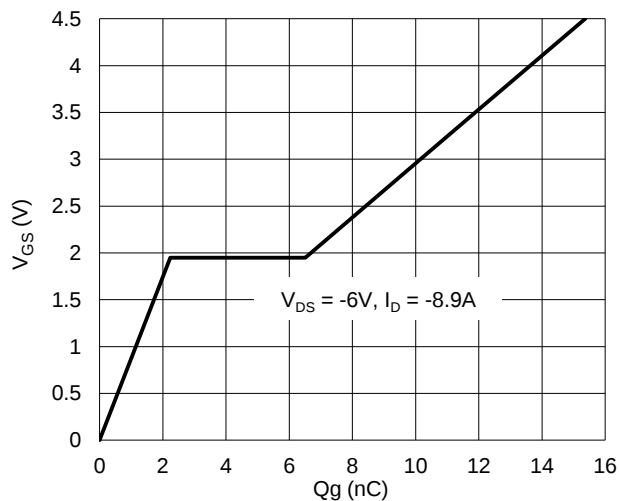


Figure 23. Gate Charge

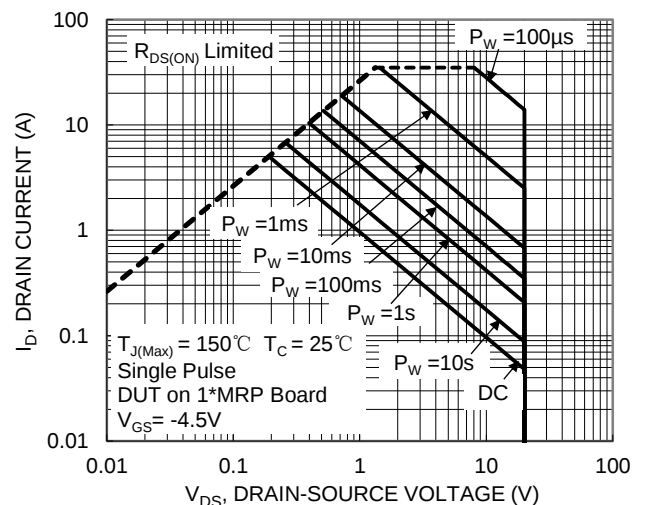


Figure 24. SOA, Safe Operation Area

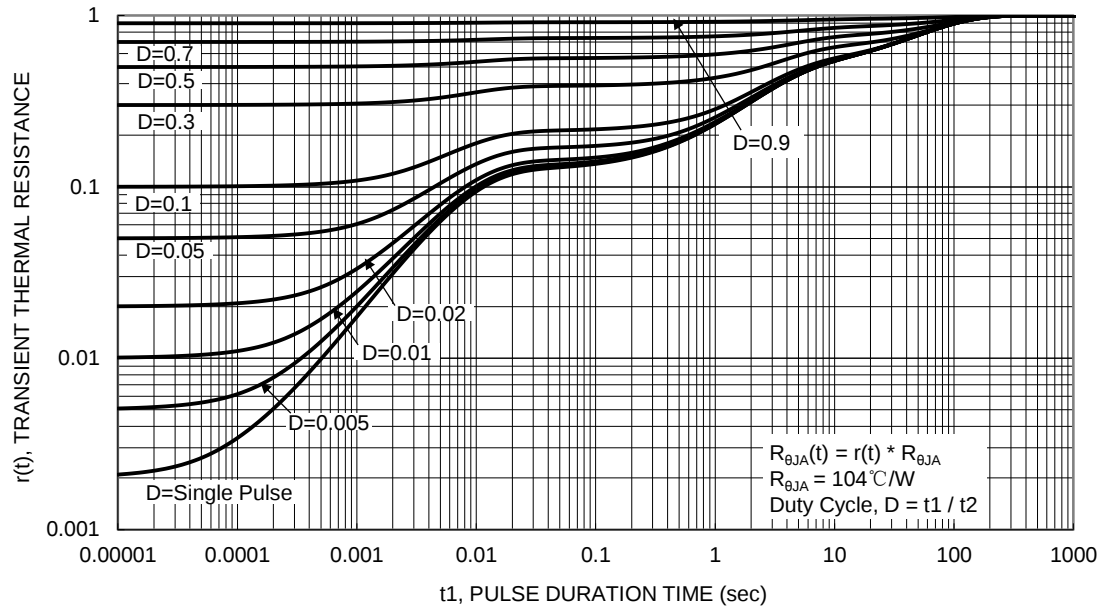
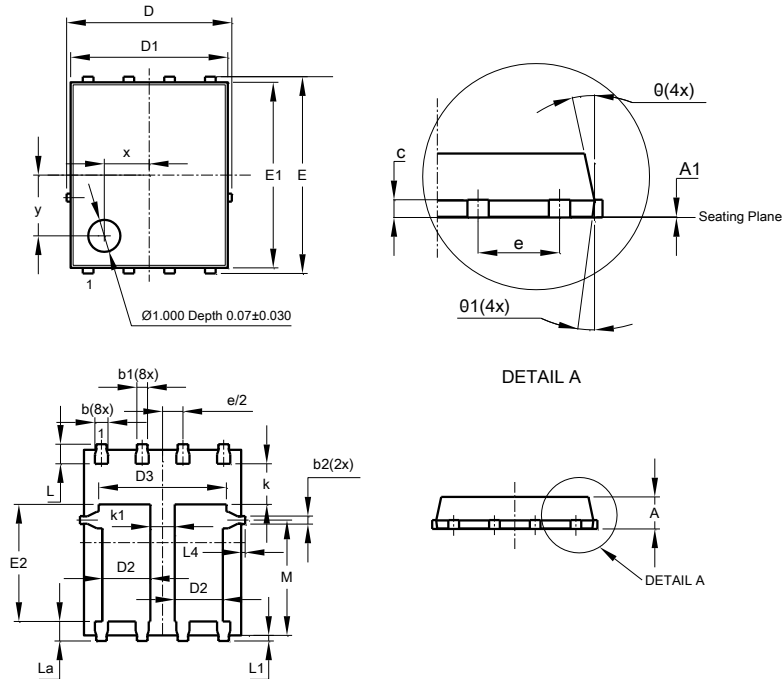


Figure 25. Transient Thermal Resistance

Package Outline Dimensions

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

PowerDI5060-8 (Type C)

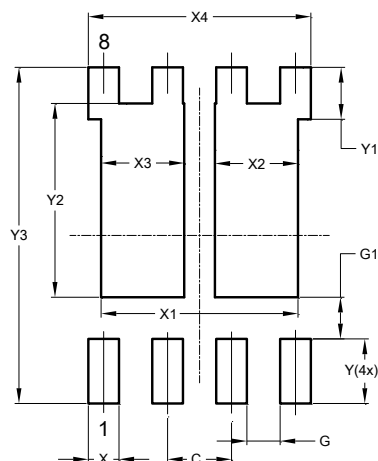


PowerDI5060-8 (Type C)			
Dim	Min	Max	Typ
A	0.90	1.10	1.00
A1	0	0.05	0.02
b	0.33	0.51	0.41
b1	0.300	0.366	0.333
b2	0.20	0.35	0.25
c	0.23	0.33	0.277
D	5.15 BSC		
D1	4.85	4.95	4.90
D2	1.40	1.60	1.50
D3	-	-	3.98
E	6.15 BSC		
E1	5.75	5.85	5.80
E2	3.56	3.76	3.66
e	1.27BSC		
k	-	-	1.27
k1	0.56	-	-
L	0.51	0.71	0.61
La	0.51	0.71	0.61
L1	0.05	0.20	0.175
L4	-	-	0.125
M	3.50	3.71	3.605
x	-	-	1.400
y	-	-	1.900
θ	10°	12°	11°
θ1	6°	8°	7°
All Dimensions in mm			

Suggested Pad Layout

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

PowerDI5060-8 (Type C)



Dimensions	Value (in mm)
C	1.270
G	0.660
G1	0.820
X	0.610
X1	3.910
X2	1.650
X3	1.650
X4	4.420
Y	1.270
Y1	1.020
Y2	3.810
Y3	6.610

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