

Product Summary

BV _{DSS}	R _{DS(ON)} MAX	I _D MAX T _A = +25°C
100V	33mΩ @ V _{GS} = 10V	6A
	50mΩ @ V _{GS} = 4.5V	5A

Description

This new generation complementary MOSFET H-Bridge features low on-resistance achievable with low gate drive.

Applications

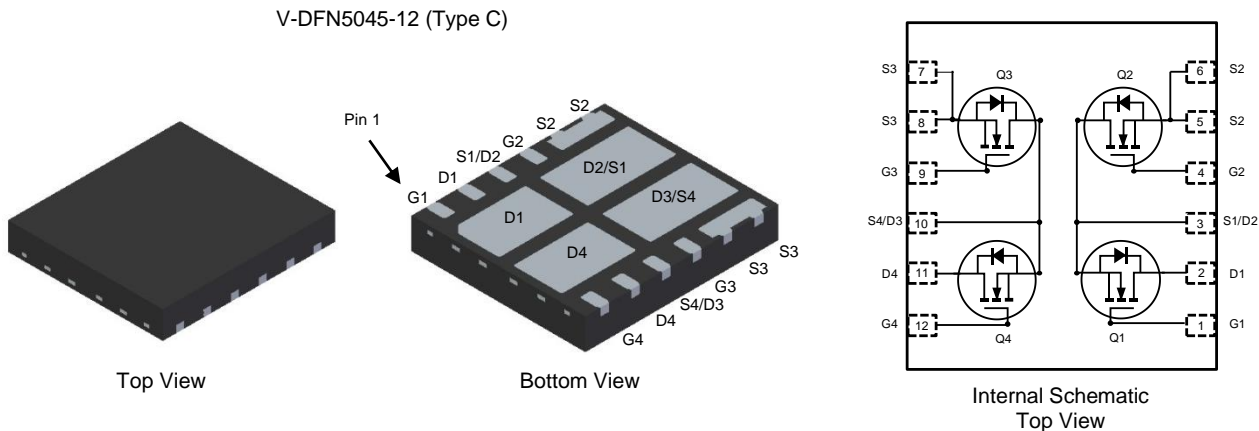
- Motor Control
- DC-DC Converters
- Power Management

Features

- Thermally Efficient Package – Cooler Running Applications
- High Conversion Efficiency
- Low R_{DS(ON)} – Minimizes On-State Losses
- Low Input Capacitance
- Fast Switching Speed
- 100% Unclamped Inductive Switching (UIS) Test in Production – Ensures More Reliable and Robust End Application
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. “Green” Device (Note 3)**
- **For automotive applications requiring specific change control (i.e. parts qualified to AEC-Q100/101/200, PPAP capable, and manufactured in IATF 16949 certified facilities), please [contact us](https://www.diodes.com/quality/product-definitions/) or your local Diodes representative.**

Mechanical Data

- Case: V-DFN5045-12
- Case Material: Molded Plastic, “Green” Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish – NiPdAu over Copper Leadframe. Solderable per MIL-STD-202, Method 208 (e4)
- Weight: 0.056 grams (Approximate)



Ordering Information (Note 4)

Part Number	Case	Packaging
DMHT10H032LFJ-13	V-DFN5045-12 (Type C)	3,000/Tape & Reel

- Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
 2. See <https://www.diodes.com/quality/lead-free/> 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 <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

Marking Information



= Manufacturer's Marking
 T1032LJ = Product Type Marking Code
 YYWW = Date Code Marking
 YY = Last Two Digits of Year (ex: 20 = 2020)
 WW = Week Code (01 to 53)

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

Characteristic	Symbol	Value	Unit
Drain-Source Voltage	V _{DSS}	100	V
Gate-Source Voltage	V _{GSS}	±20	V
Continuous Drain Current (Note 6) V _{GS} = 10V	I _D	6	A
Steady State		5	
Pulsed Drain Current (10µs Pulse, Duty Cycle = 1%)	I _{DM}	40	A
Maximum Continuous Body Diode Forward Current (Note 6)	I _S	2.5	A
Pulsed Body Diode Current (10µs Pulse, Duty Cycle = 1%)	I _{SM}	40	A
Avalanche Current (Note 7) L = 0.3mH	I _{AS}	13	A
Avalanche Energy (Note 7) L = 0.3mH	E _{AS}	25.3	mJ

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Total Power Dissipation (Note 5)	P _D	0.9	W
Thermal Resistance, Junction to Ambient (Note 5)	R _{θJA}	130	°C/W
Total Power Dissipation (Note 6)	P _D	1.9	W
Thermal Resistance, Junction to Ambient (Note 6)	R _{θJA}	64	°C/W
Thermal Resistance, Junction to Case (Note 6)	R _{θJC}	11	°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-55 to +150	°C

Electrical Characteristics (@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}	100	—	—	V	V _{GS} = 0V, I _D = 1mA
Zero Gate Voltage Drain Current	I _{DSS}	—	—	1	µA	V _{DS} = 80V, V _{GS} = 0V
Gate-Source Leakage	I _{GSS}	—	—	±100	nA	V _{GS} = ±20V, V _{DS} = 0V
ON CHARACTERISTICS (Note 8)						
Gate Threshold Voltage	V _{GS(TH)}	1.3	—	2.5	V	V _{DS} = V _{GS} , I _D = 250µA
Static Drain-Source On-Resistance	R _{DS(ON)}	—	25	33	mΩ	V _{GS} = 10V, I _D = 6A
		—	34	50		V _{GS} = 4.5V, I _D = 4A
Diode Forward Voltage	V _{SD}	—	0.8	1.0	V	V _{GS} = 0V, I _S = 6A
DYNAMIC CHARACTERISTICS (Note 9)						
Input Capacitance	C _{iss}	—	683	—	pF	V _{DS} = 50V, V _{GS} = 0V, f = 1MHz
Output Capacitance	C _{oss}	—	165	—	pF	
Reverse Transfer Capacitance	C _{rss}	—	6.9	—	pF	
Gate Resistance	R _g	—	1.2	—	Ω	V _{DS} = 0V, V _{GS} = 0V, f = 1MHz
Total Gate Charge (V _{GS} = 4.5V)	Q _g	—	6.3	—	nC	V _{DS} = 50V, I _D = 6A
Total Gate Charge (V _{GS} = 10V)	Q _g	—	11.9	—	nC	
Gate-Source Charge	Q _{gs}	—	2.0	—	nC	
Gate-Drain Charge	Q _{gd}	—	3.1	—	nC	
Turn-On Delay Time	t _{D(ON)}	—	4.1	—	ns	V _{DS} = 50V, R _L = 5.85Ω V _{GS} = 10V, R _{GEN} = 3Ω
Turn-On Rise Time	t _R	—	4.5	—	ns	
Turn-Off Delay Time	t _{D(OFF)}	—	12.5	—	ns	
Turn-Off Fall Time	t _F	—	9.3	—	ns	
Reverse Recovery Time	t _{RR}	—	31.5	—	ns	I _F = 6A, di/dt = 500A/µs
Reverse Recovery Charge	Q _{RR}	—	94.6	—	nC	

- Notes:
- Device mounted on FR-4 PC board, with minimum recommended pad layout, single sided.
 - Device mounted on FR-4 substrate PC board, 2oz copper, with thermal bias to bottom layer 1-inch square copper plate.
 - I_{AS} and E_{AS} ratings are based on low frequency and duty cycles to keep T_J = +25°C.
 - Short duration pulse test used to minimize self-heating effect.
 - Guaranteed by design. Not subject to product testing.

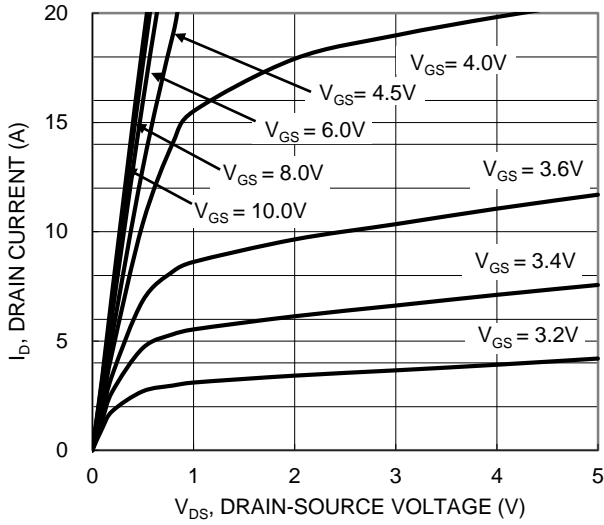


Figure 1. Typical Output Characteristic

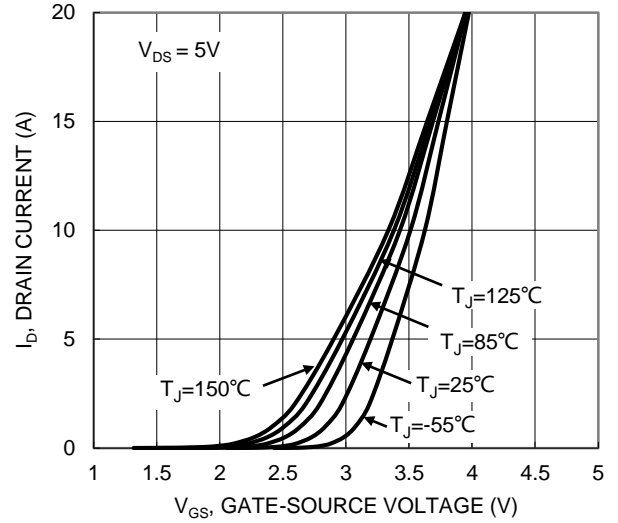


Figure 2. Typical Transfer Characteristic

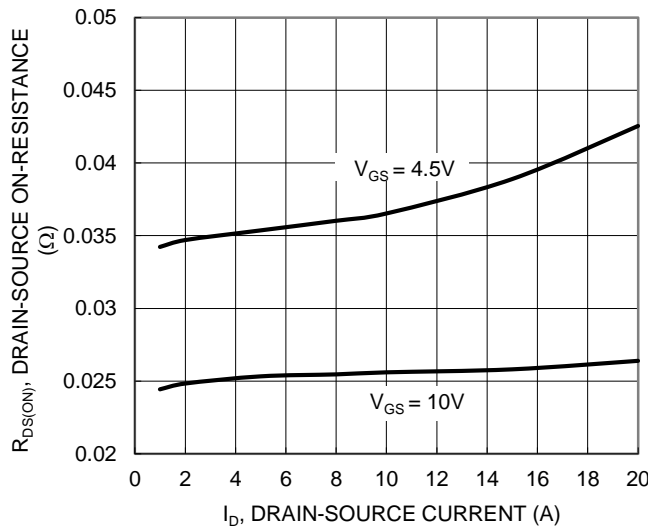


Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage

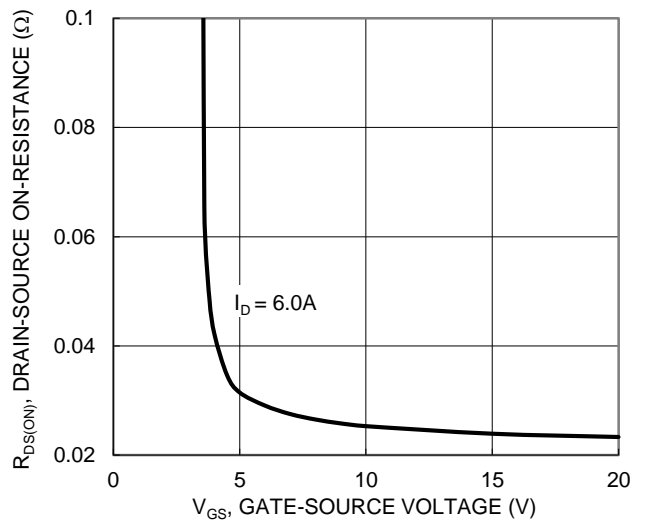


Figure 4. Typical Transfer Characteristic

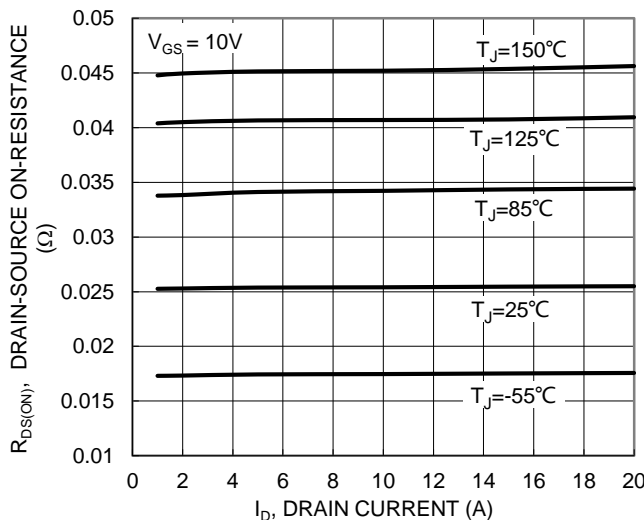


Figure 5. Typical On-Resistance vs. Drain Current and Junction Temperature

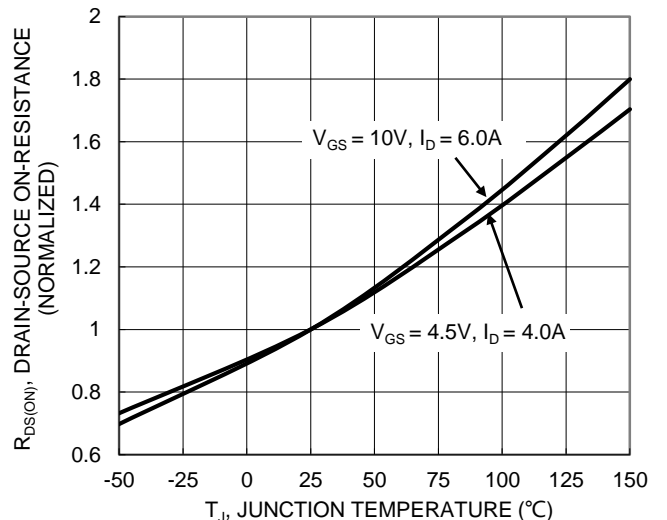


Figure 6. On-Resistance Variation with Junction Temperature

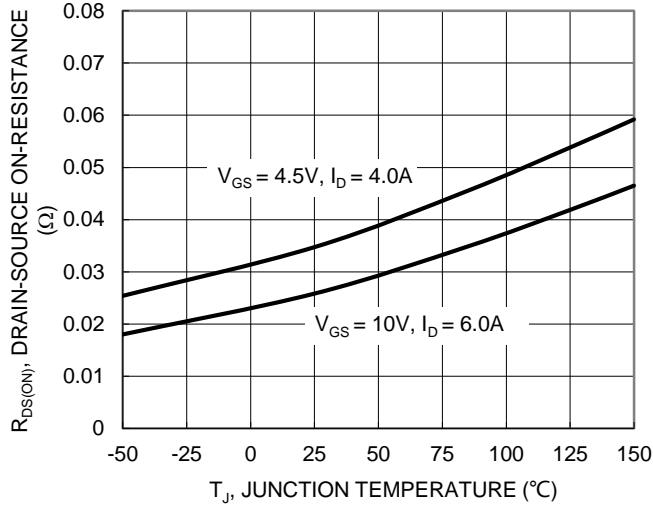


Figure 7. On-Resistance Variation with Junction Temperature

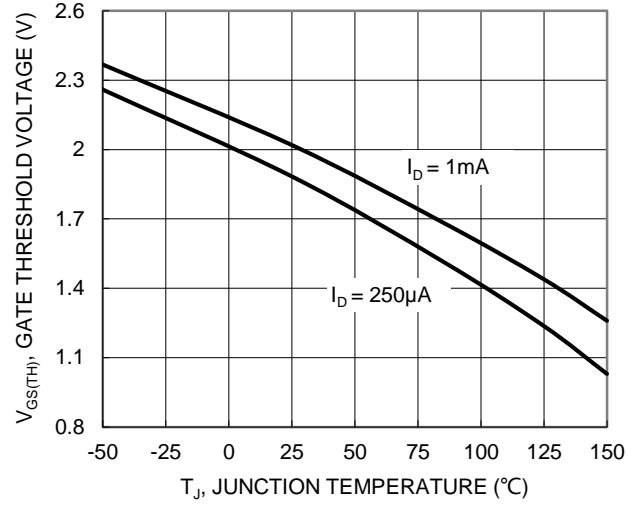


Figure 8. Gate Threshold Variation vs. Junction Temperature

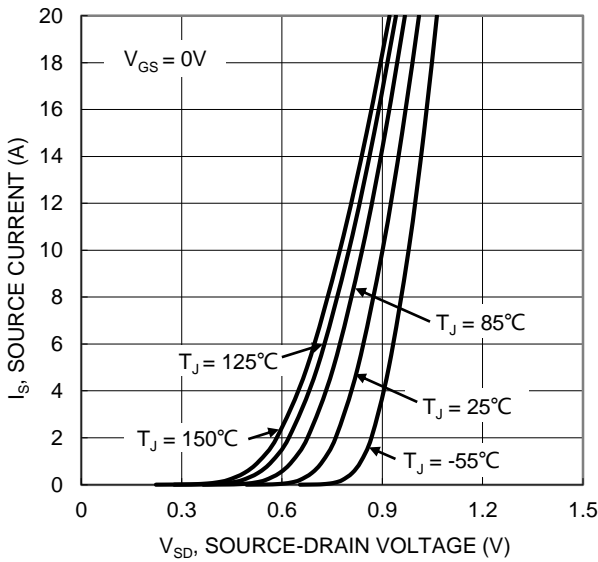


Figure 9. Diode Forward Voltage vs. Current

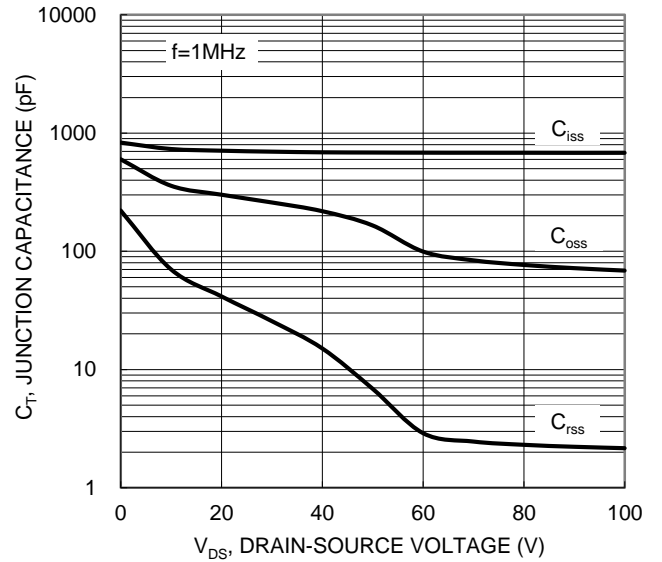


Figure 10. Typical Junction Capacitance

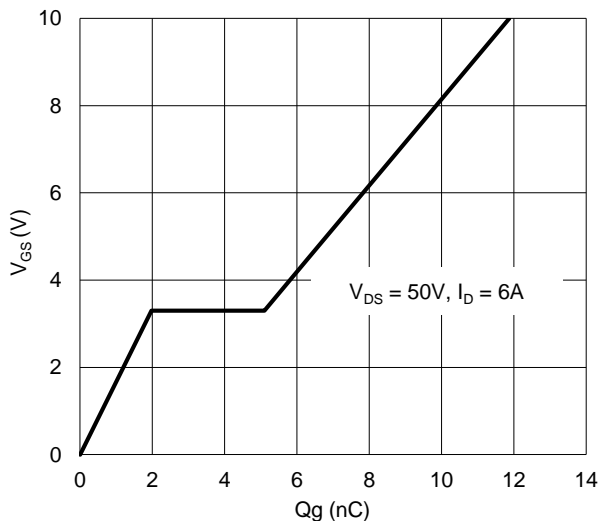


Figure 11. Gate Charge

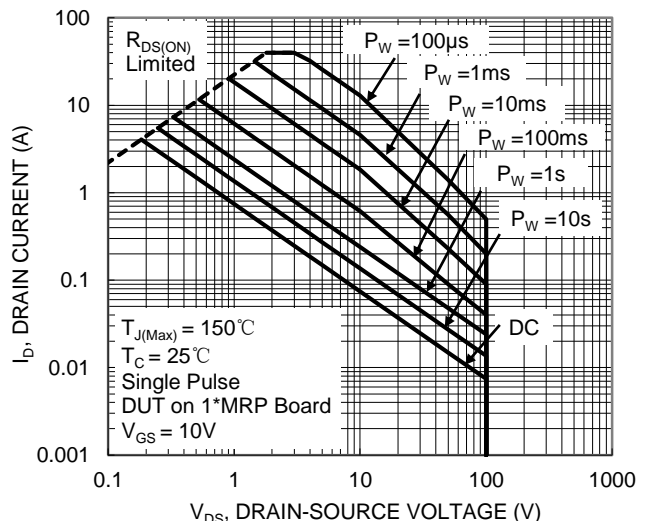


Figure 12. SOA, Safe Operation Area

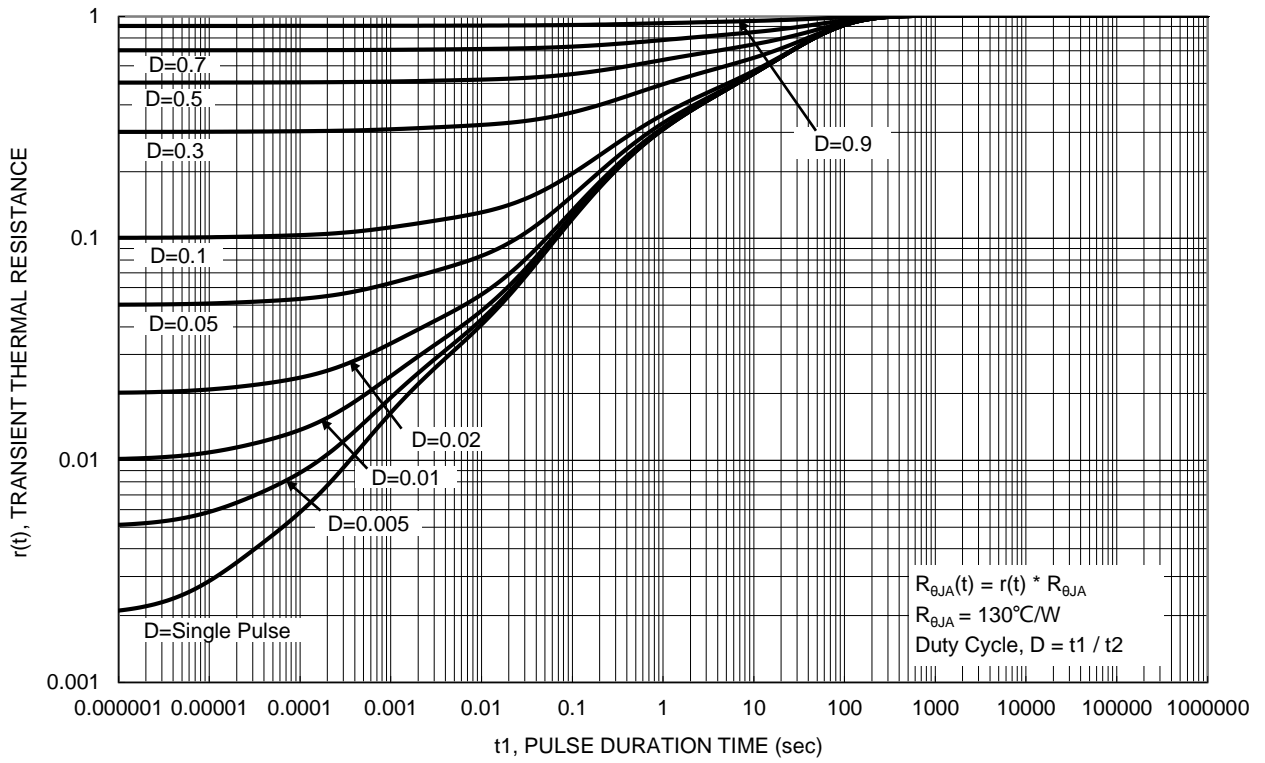
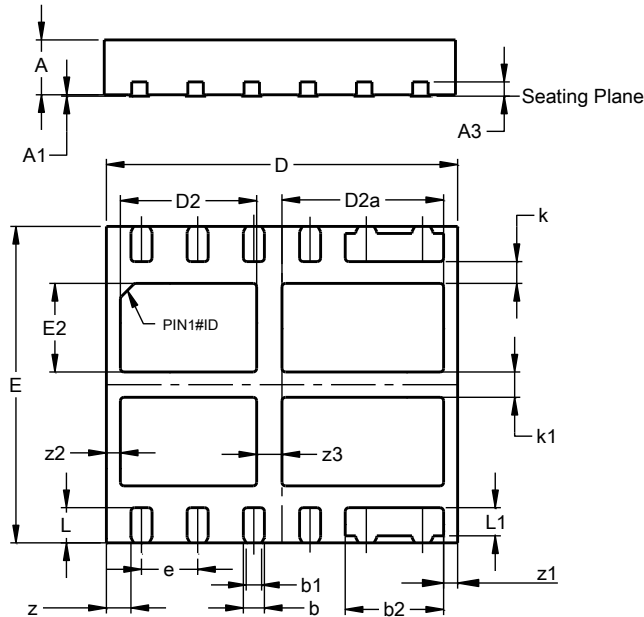


Figure 13. Transient Thermal Resistance

Package Outline Dimensions

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

V-DFN5045-12 (Type C)

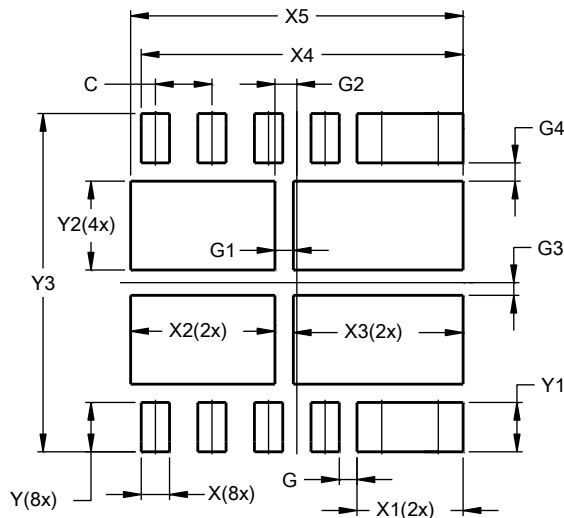


V-DFN5045-12 (Type C)			
Dim	Min	Max	Typ
A	0.75	0.85	0.80
A1	0.00	0.05	0.02
A3	--	--	0.203
b	0.25	0.35	0.30
b1	0.17	0.27	0.22
b2	1.35	1.45	1.40
D	4.95	5.05	5.00
D2	1.84	2.04	1.94
D2a	2.20	2.40	2.30
e	--	--	0.80
E	4.45	4.55	4.50
E2	1.16	1.36	1.26
k	--	--	0.31
k1	--	--	0.36
L	0.45	0.55	0.50
L1	0.35	0.45	0.40
z	--	--	0.35
z1	--	--	0.20
z2	--	--	0.20
z3	--	--	0.36
All Dimensions in mm			

Suggested Pad Layout

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

V-DFN5045-12 (Type C)



Dimensions	Value (in mm)
C	0.800
G	0.250
G1	0.260
G2	0.310
G3	0.180
G4	0.260
X	0.400
X1	1.500
X2	2.040
X3	2.400
X4	4.550
X5	4.700
Y	0.700
Y1	0.700
Y2	1.260
Y3	4.800

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