

**DUAL N-CHANNEL ENHANCEMENT MODE FIELD EFFECT TRANSISTOR**
**Product Summary**

<b>BV<sub>DSS</sub></b>	<b>R<sub>DS(ON)</sub> Max</b>	<b>I<sub>D</sub> Max</b> <b>T<sub>A</sub> = +25°C</b>
60V	3Ω @ V <sub>GS</sub> = 5V	0.3A

**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:

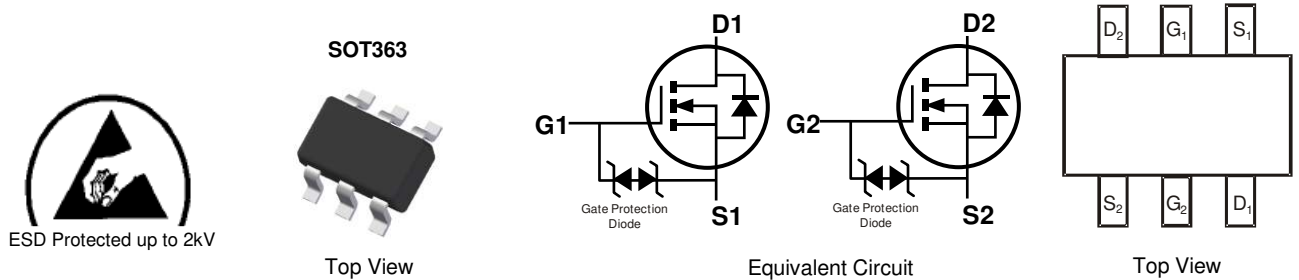
- Motor Control
- Power Management Functions

**Features**

- Dual N-Channel MOSFET
- Low On-Resistance
- Low Gate Threshold Voltage
- Low Input Capacitance
- Fast Switching Speed
- Low Input/Output Leakage
- Ultra-Small Surface Mount Package
- **ESD Protected**
- **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)**

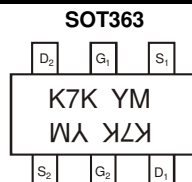
**Mechanical Data**

- Case: SOT363
- Case Material: Molded Plastic. "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Matte Tin Finish Annealed over Alloy 42 Leadframe (Lead-Free Plating). Solderable per MIL-STD-202, Method 208 ③
- Terminal Connections: See Diagram
- Weight: 0.006 grams (Approximate)


**Ordering Information** (Note 5)

Part Number	Case	Packaging
DMN601DWKQ-7	SOT363	3,000/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](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**


K7K = Product Type Marking Code  
 YM = Date Code Marking  
 Y or Y = Year (ex: E = 2017)  
 M = Month (ex: 9 = September)

## Date Code Key

Year	2005	2006	---	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Code	S	T	---	C	D	E	F	G	H	I	J	K	L

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<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Drain Source Voltage	V <sub>DSS</sub>	60	V
Gate-Source Voltage	V <sub>GSS</sub>	±20	V
Drain Current (Note 6)	Continuous	305	mA
	Pulsed (Note 7)	800	

**Thermal Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Total Power Dissipation (Note 6)	P <sub>D</sub>	200	mW
Thermal Resistance, Junction to Ambient	R <sub>θJA</sub>	625	°C/W
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-65 to +150	°C

**Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
<b>OFF CHARACTERISTICS</b> (Note 8)						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	60	—	—	V	V <sub>GS</sub> = 0V, I <sub>D</sub> = 10μA
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	—	—	1	μA	V <sub>DS</sub> = 60V, V <sub>GS</sub> = 0V
Gate-Source Leakage	I <sub>GSS</sub>	—	—	±10	μA	V <sub>GS</sub> = ±20V, V <sub>DS</sub> = 0V
<b>ON CHARACTERISTICS</b> (Note 8)						
Gate Threshold Voltage	V <sub>GS(TH)</sub>	1.0	1.6	2.5	V	V <sub>DS</sub> = 10V, I <sub>D</sub> = 1mA
Static Drain-Source On-Resistance	R <sub>DS(ON)</sub>	—	—	2.0 3.0	Ω	V <sub>GS</sub> = 10V, I <sub>D</sub> = 0.5A V <sub>GS</sub> = 5V, I <sub>D</sub> = 0.05A
Forward Transfer Admittance	Y <sub>fs</sub>	80	—	—	ms	V <sub>DS</sub> = 10V, I <sub>D</sub> = 0.2A
Diode Forward Voltage (Note 9)	V <sub>SD</sub>	0.5	—	1.4	V	V <sub>GS</sub> = 0V, I <sub>S</sub> = 115mA
<b>DYNAMIC CHARACTERISTICS</b> (Note 9)						
Input Capacitance	C <sub>iss</sub>	—	30	50	pF	V <sub>DS</sub> = 25V, V <sub>GS</sub> = 0V f = 1.0MHz
Output Capacitance	C <sub>oss</sub>	—	4.2	25	pF	
Reverse Transfer Capacitance	C <sub>rss</sub>	—	2.9	5.0	pF	
Gate Resistance	R <sub>g</sub>	—	133	—	Ω	f = 1MHz, V <sub>GS</sub> = 0V, V <sub>DS</sub> = 0V
Total Gate Charge	Q <sub>g</sub>	—	304	—	pC	V <sub>GS</sub> = 4.5V, V <sub>DS</sub> = 10V, I <sub>D</sub> = 250mA
Gate-Source Charge	Q <sub>gs</sub>	—	203	—	pC	
Gate-Drain Charge	Q <sub>gd</sub>	—	84	—	pC	
Turn-On Delay Time	t <sub>D(ON)</sub>	—	3.9	—	ns	V <sub>DD</sub> = 30V, V <sub>GS</sub> = 10V, R <sub>G</sub> = 25Ω, I <sub>D</sub> = 200mA
Turn-On Rise Time	t <sub>r</sub>	—	3.4	—	ns	
Turn-Off Delay Time	t <sub>D(OFF)</sub>	—	15.7	—	ns	
Turn-Off Fall Time	t <sub>f</sub>	—	9.9	—	ns	

- Notes:
- Device mounted on FR-4 PCB.
  - Pulse width ≤10μs, duty cycle ≤1%.
  - Short duration pulse test used to minimize self-heating effect.
  - Guaranteed by design. Not subject to product testing.

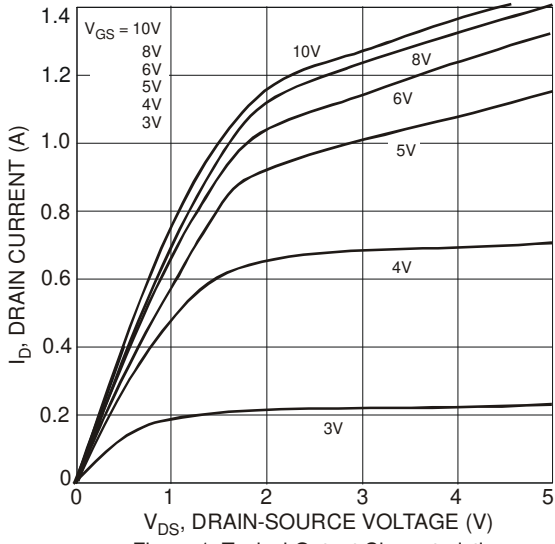


Figure 1 Typical Output Characteristics

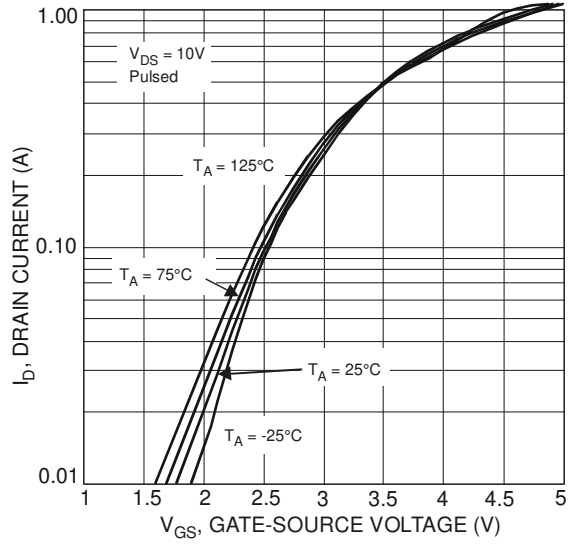


Figure 2 Typical Transfer Characteristics

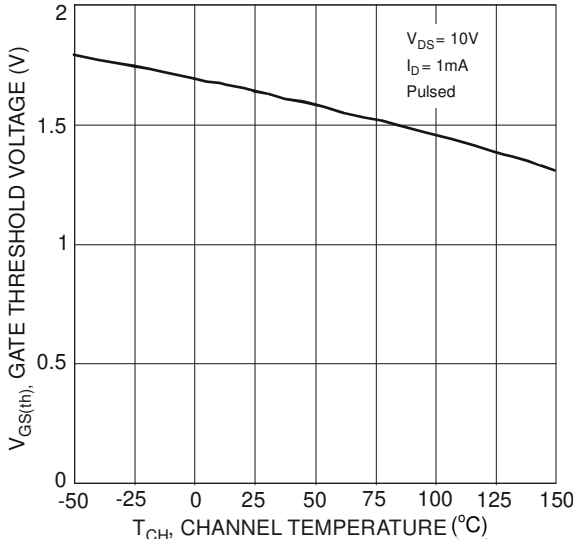


Figure 3 Gate Threshold Voltage vs. Channel Temperature

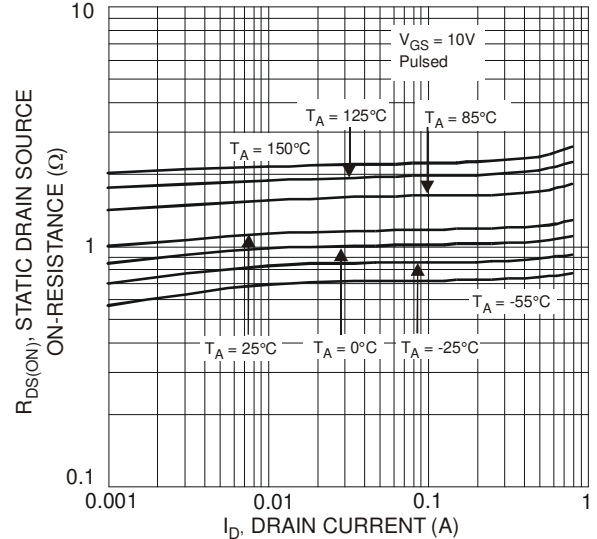


Figure 4 Static Drain-Source On-Resistance vs. Drain Current

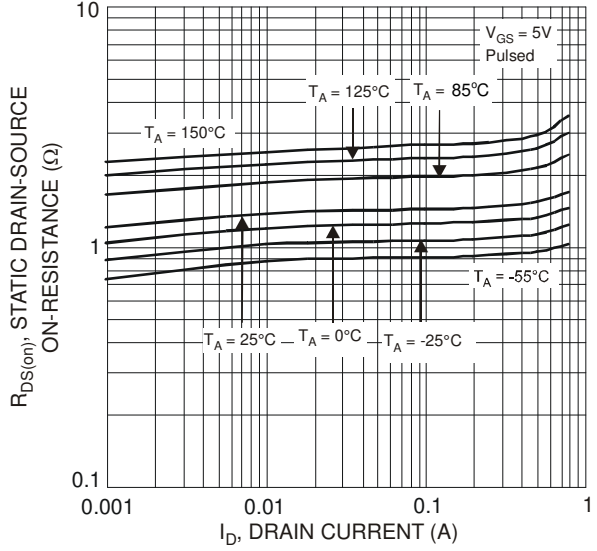


Figure 5 Static Drain-Source On-Resistance vs. Drain Current

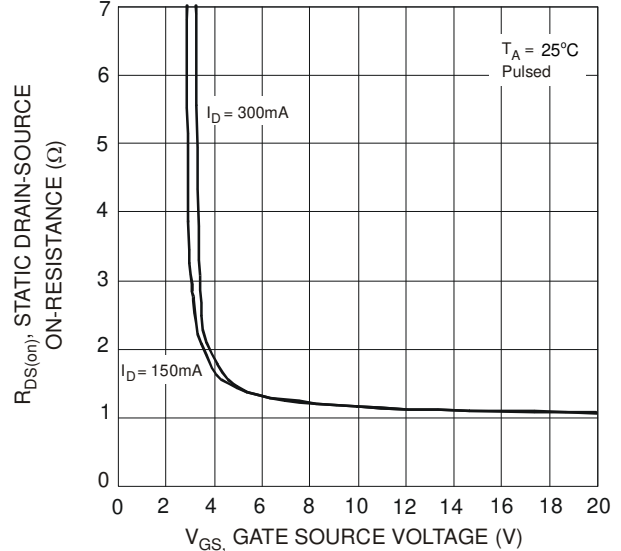


Figure 6 Static Drain-Source On-Resistance vs. Gate-Source Voltage

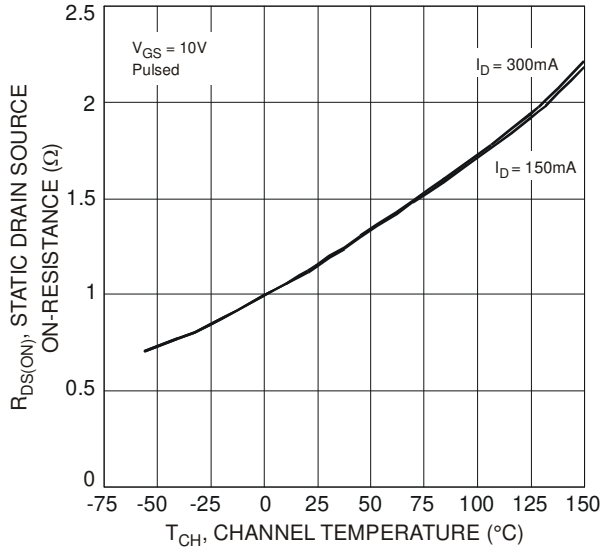


Figure 7 Static Drain-Source On-State Resistance vs. Channel Temperature

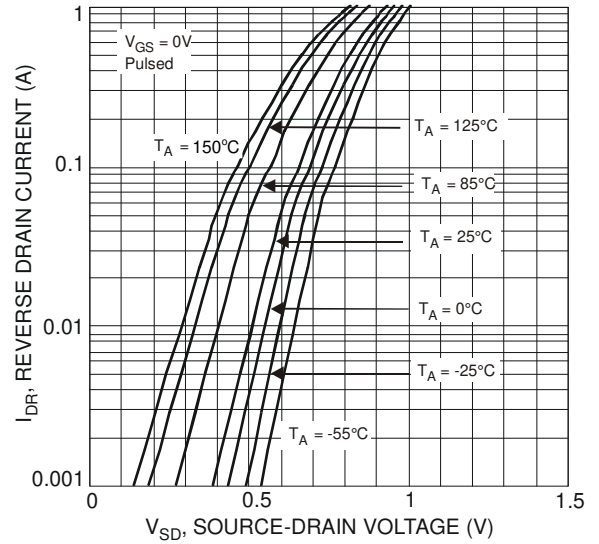


Figure 8 Reverse Drain Current vs. Source-Drain Voltage

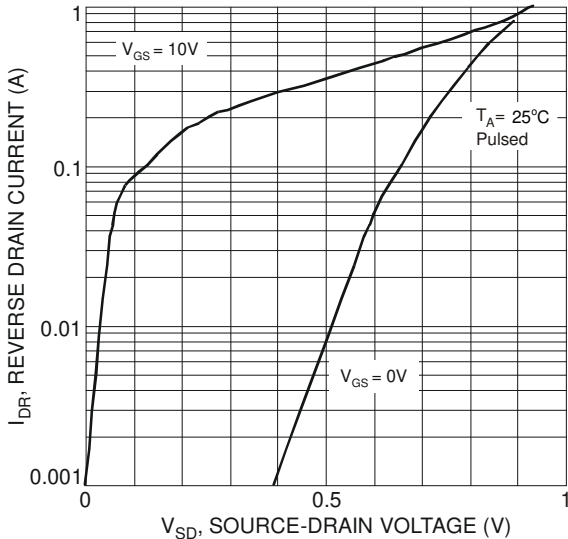


Figure 9 Reverse Drain Current vs. Source-Drain Voltage

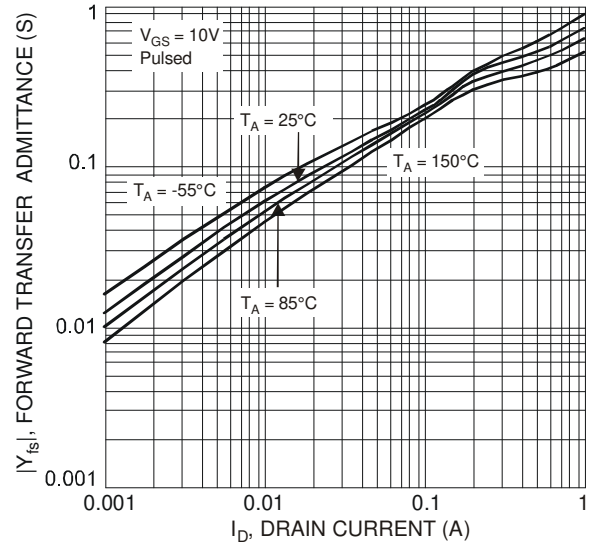


Figure 10 Forward Transfer Admittance vs. Drain Current

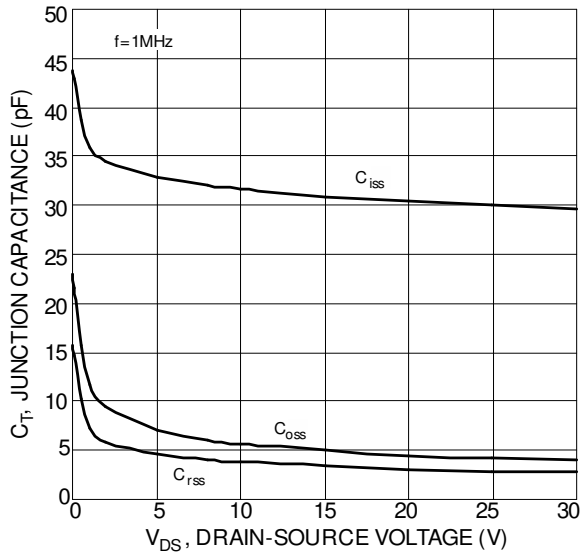


Figure 11 Typical Junction Capacitance

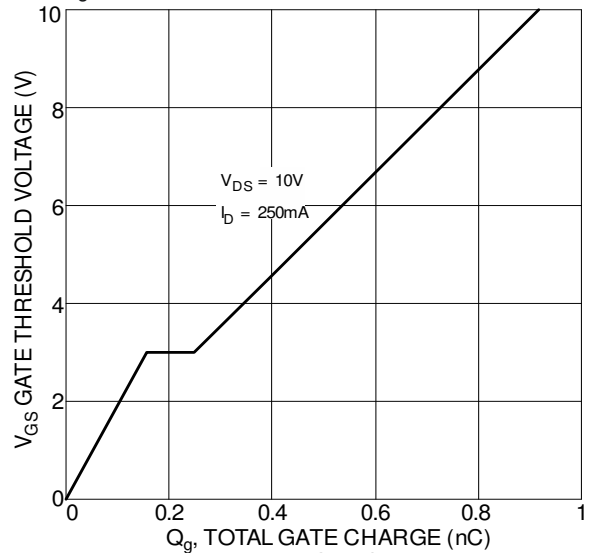


Figure 12 Gate Charge

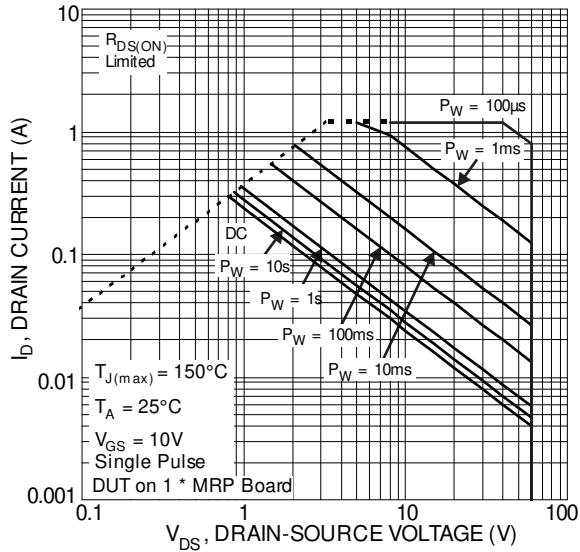


Figure 13 SOA, Safe Operation Area

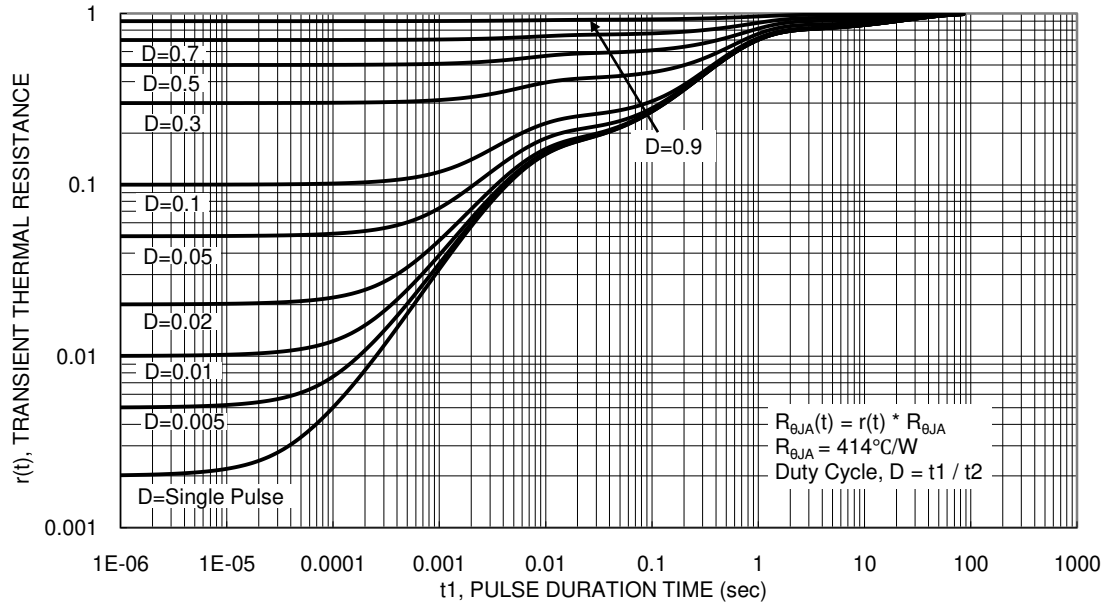
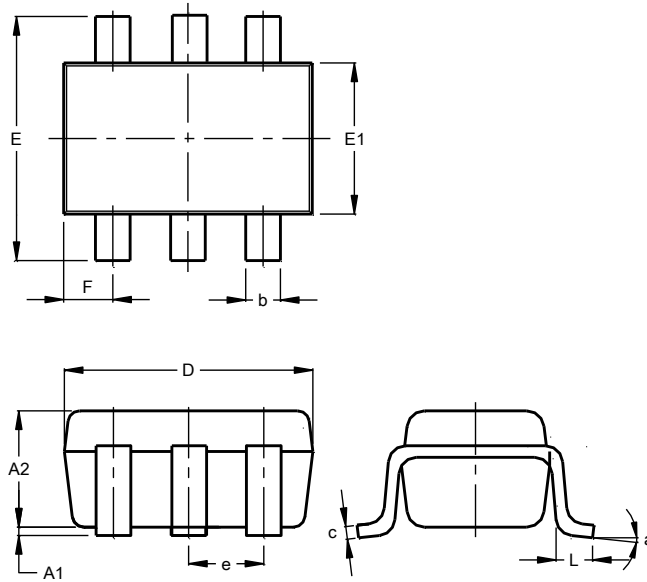


Figure 14 Transient Thermal Resistance

**Package Outline Dimensions**

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

**SOT363**

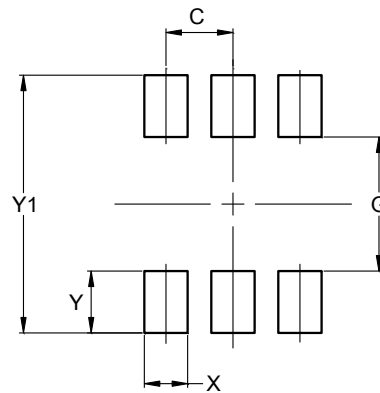


SOT363			
Dim	Min	Max	Typ
A1	0.00	0.10	0.05
A2	0.90	1.00	1.00
b	0.10	0.30	0.25
c	0.10	0.22	0.11
D	1.80	2.20	2.15
E	2.00	2.20	2.10
E1	1.15	1.35	1.30
e	0.650 BSC		
F	0.40	0.45	0.425
L	0.25	0.40	0.30
a	0°	8°	--
<b>All Dimensions in mm</b>			

**Suggested Pad Layout**

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

**SOT363**



Dimensions	Value (in mm)
C	0.650
G	1.300
X	0.420
Y	0.600
Y1	2.500

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