

# 2N7002DW-TP Datasheet

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DiGi Electronics Part Number	2N7002DW-TP-DG
Manufacturer	<a href="#">Micro Commercial Co</a>
Manufacturer Product Number	2N7002DW-TP
Description	MOSFET 2N-CH 60V 0.115A SOT363
Detailed Description	Mosfet Array 60V 115mA 200mW Surface Mount SO T-363

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## Purchase and inquiry

Manufacturer Product Number:

2N7002DW-TP

Series:

-

Technology:

MOSFET (Metal Oxide)

FET Feature:

-

Current - Continuous Drain (Id) @ 25°C:

115mA

Vgs(th) (Max) @ Id:

2V @ 250µA

Input Capacitance (Ciss) (Max) @ Vds:

50pF @ 25V

Operating Temperature:

-55°C ~ 150°C (TJ)

Package / Case:

6-TSSOP, SC-88, SOT-363

Base Product Number:

2N7002

Manufacturer:

Micro Commercial Co

Product Status:

Active

Configuration:

2 N-Channel (Dual)

Drain to Source Voltage (Vdss):

60V

Rds On (Max) @ Id, Vgs:

7.50hm @ 50mA, 5V

Gate Charge (Qg) (Max) @ Vgs:

-

Power - Max:

200mW

Mounting Type:

Surface Mount

Supplier Device Package:

SOT-363

## Environmental & Export classification

RoHS Status:

ROHS3 Compliant

REACH Status:

REACH Unaffected

HTSUS:

8541.21.0095

Moisture Sensitivity Level (MSL):

1 (Unlimited)

ECCN:

EAR99

## Features

- High Density Cell Design For Low  $R_{DS(ON)}$
- Voltage Controlled Small Signal Switch
- Epoxy Meets UL 94 V-0 Flammability Rating
- Moisture Sensitivity Level 1
- Halogen Free. "Green" Device (Note1)
- Lead Free Finish/RoHS Compliant ("P" Suffix Designates RoHS Compliant. See Ordering Information)

## Maximum Ratings

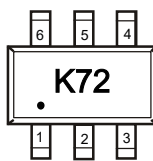
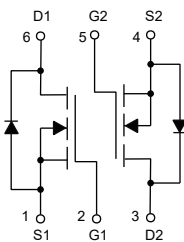
- Operating Junction Temperature Range : -55°C to +150°C
- Storage Temperature Range: -55°C to +150°C
- Thermal Resistance: 415°C/W Junction to Ambient (Steady-State) (Note2)

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	$V_{DS}$	60	V
Gate-Source Voltage	$V_{GS}$	±20	V
Continuous Drain Current	$I_D$	$T_A=25^\circ\text{C}$	340
		$T_A=100^\circ\text{C}$	215
Pulsed Drain Current (Note3)	$I_{DM}$	1.36	A
Total Power Dissipation (Note4)	$P_D$	300	mW

Note:

1. Halogen free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
2. The value of  $R_{\theta JA}$  is measured with the device mounted on 1in<sup>2</sup> FR-4 board with 2oz. Copper, in a still air environment with  $T_A=25^\circ\text{C}$ . The Power dissipation  $P_{DSM}$  is based on  $R_{\theta JA} t \leq 10\text{s}$  and the maximum allowed junction temperature of 150°C. The value in any given application depends on the user's specific board design.
3. Repetitive rating; pulse width limited by max. junction temperature.
4.  $P_D$  is based on max. junction temperature, using junction-ambient thermal resistance.

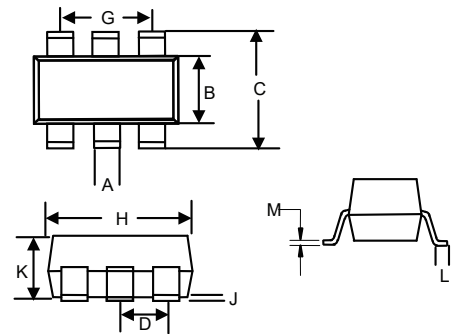
## Internal Structure and Marking Code



Dot Denotes Pin1

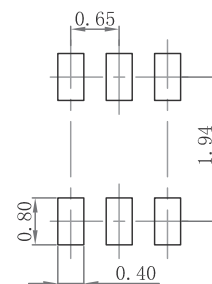
# DUAL N-CHANNEL MOSFET

## SOT-363



DIM	INCHES		MM		NOTE
	MIN	MAX	MIN	MAX	
A	0.006	0.014	0.15	0.35	
B	0.045	0.053	1.15	1.35	
C	0.079	0.096	2.00	2.45	
D	0.026		0.65		TYP.
G	0.047	0.055	1.20	1.40	
H	0.071	0.087	1.80	2.20	
J	-----	0.004	-----	0.10	
K	0.031	0.043	0.80	1.10	
L	0.010	0.018	0.26	0.46	
M	0.003	0.006	0.08	0.15	

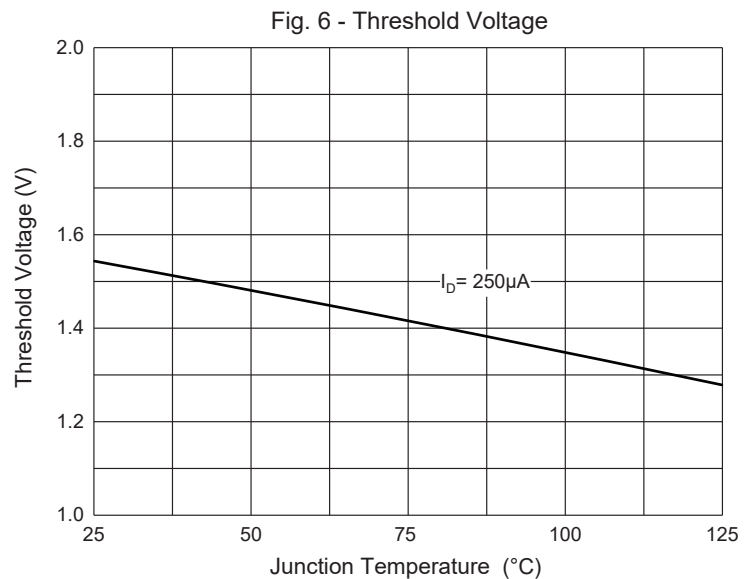
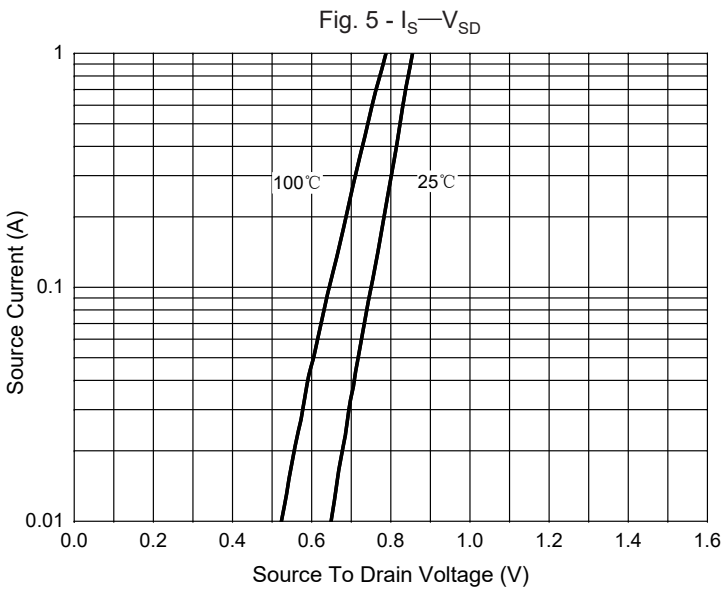
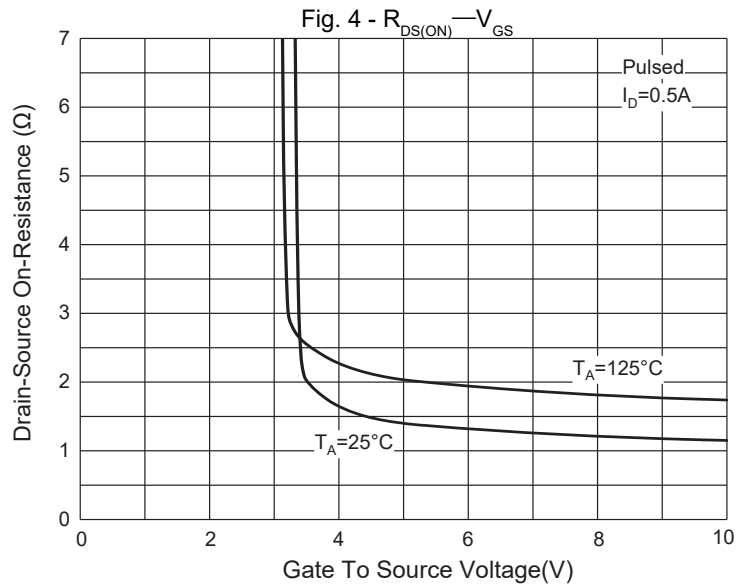
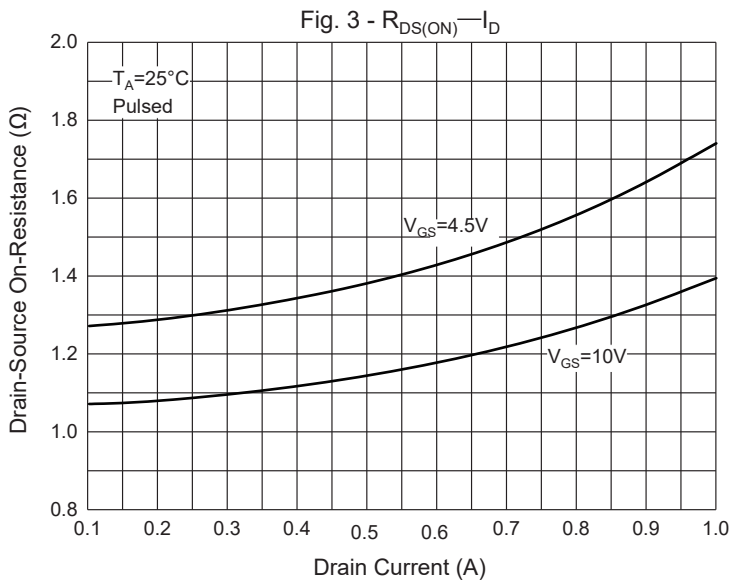
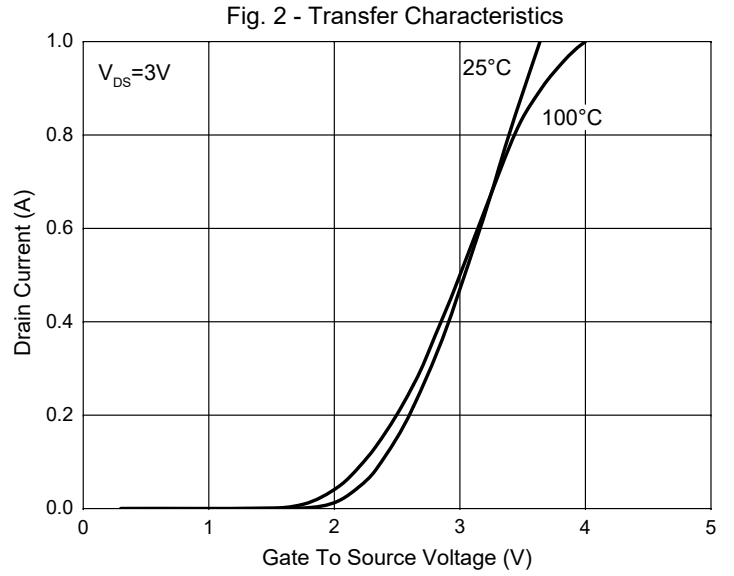
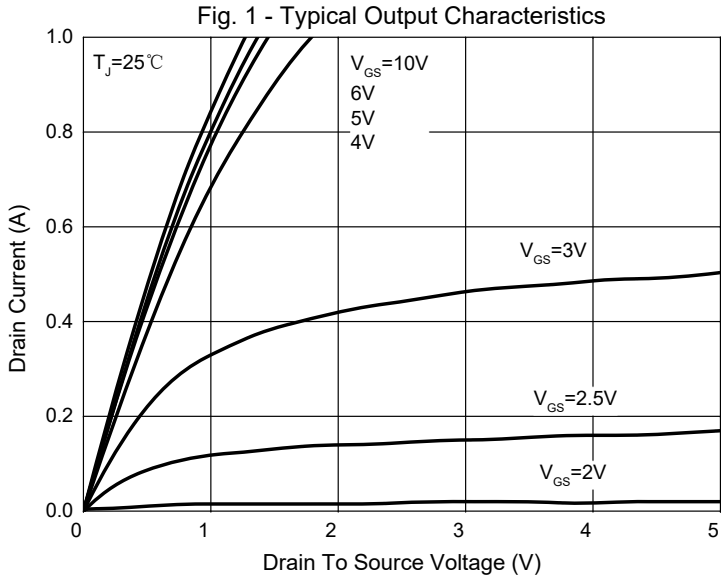
## SUGGESTED SOLDER PAD LAYOUT



## Electrical Characteristics @ 25°C (Unless Otherwise Specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
<b>Static Characteristics</b>						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu A$	60			V
Gate-Source Leakage Current	$I_{GSS}$	$V_{DS}=0V, V_{GS}=\pm 20V$			$\pm 10$	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=60V, V_{GS}=0V$			80	
Gate-Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1.0	1.5	2.5	V
Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=300mA$		1.1	2.5	$\Omega$
		$V_{GS}=4.5V, I_D=200mA$		1.3	3	
Forward Transconductance	$g_{fs}$	$V_{DS}=10V, I_D=200mA$	80			ms
Gate Resistance	$R_g$	F=1 MHz, Open drain		4.1		$\Omega$
<b>Diode Characteristics</b>						
Continuous Body Diode Current	$I_S$				115	mA
Diode Forward Voltage	$V_{SD}$	$V_{GS}=0V, I_S=115mA$	0.55		1.2	V
Reverse Recovery Time	$t_{rr}$	$I_F=0.5A, dI_F/dt=100A/\mu s$		9.4		ns
Reverse Recovery Charge	$Q_{rr}$				3.1	
<b>Dynamic Characteristics</b>						
Input Capacitance	$C_{iss}$	$V_{DS}=25V, V_{GS}=0V, f=1MHz$		25.2		pF
Output Capacitance	$C_{oss}$			3.5		
Reverse Transfer Capacitance	$C_{rss}$			2.2		
Total Gate Charge	$Q_g$	$V_{DS}=25V, V_{GS}=10V, I_D=0.5A$		1.1		nC
Gate-Source Charge	$Q_{gs}$			0.19		
Gate-Drain Charge	$Q_{gd}$			0.25		
Turn-On Delay Time	$t_{d(on)}$	$V_{DD}=25V, V_{GEN}=10V, R_{GEN}=25\Omega, I_{DS}=500mA$		2.3		ns
Turn-On Rise Time	$t_r$			2.7		
Turn-Off Delay Time	$t_{d(off)}$			6.3		
Turn-Off Fall Time	$t_f$			3		

Curve Characteristics



Curve Characteristics

Fig.7-NormalizedOnResistanceCharacteristics

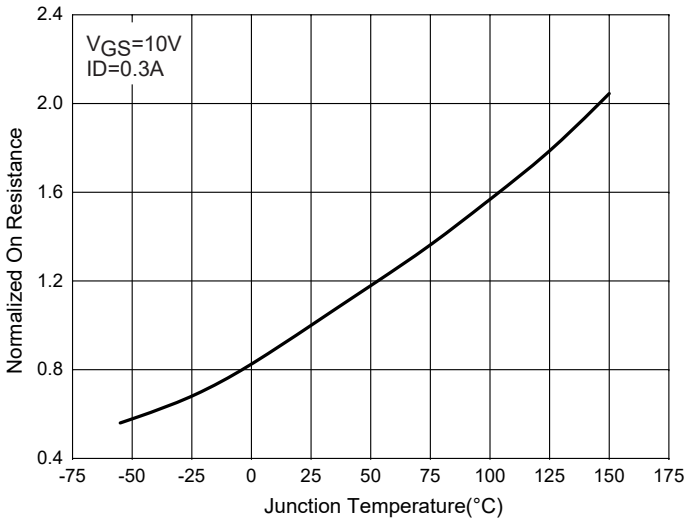


Fig. 8 - GateCharge

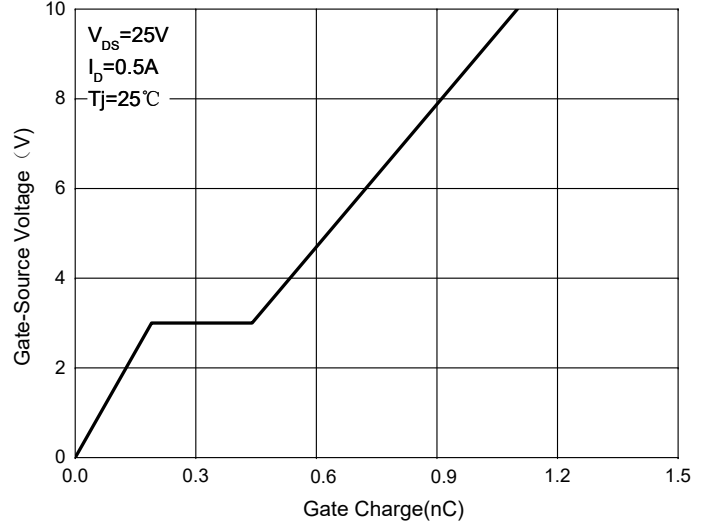


Fig. 9 - Capacitance Characteristics

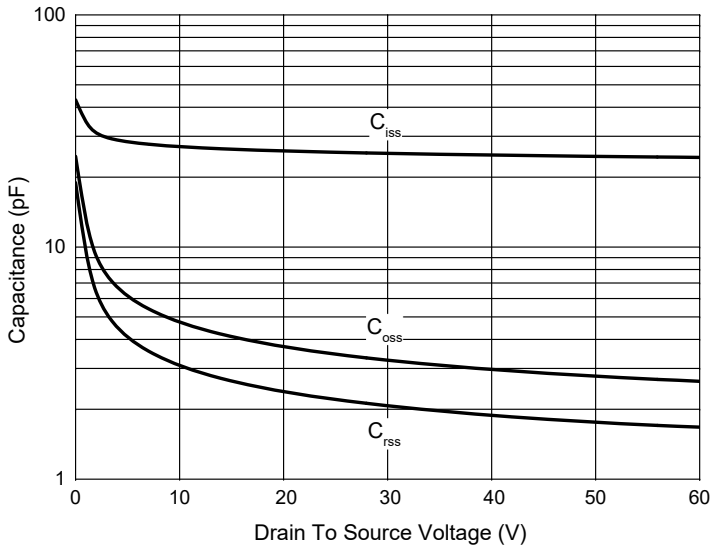


Fig. 10 - Current dissipation

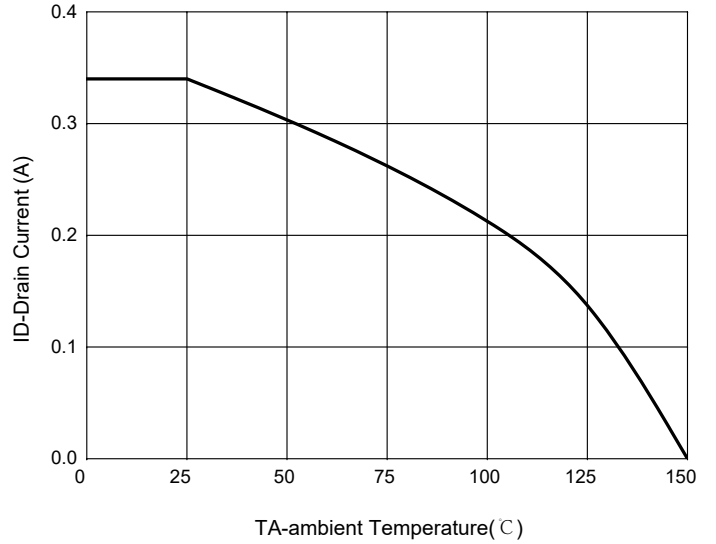
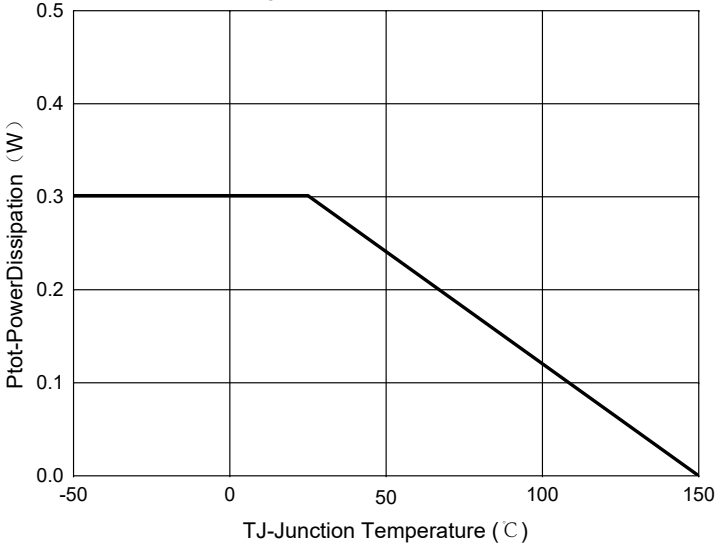


Fig.11-PowerDissipation



Curve Characteristics

Fig. 12 - Safe Operation Area

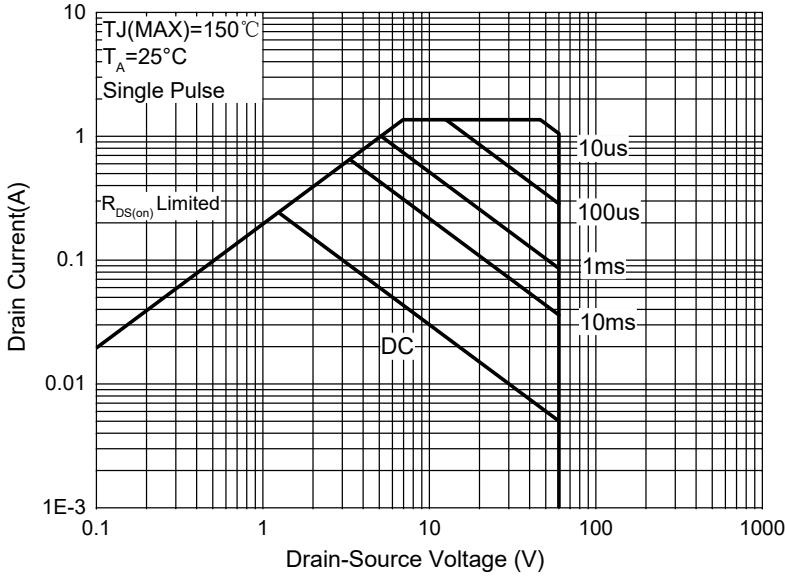
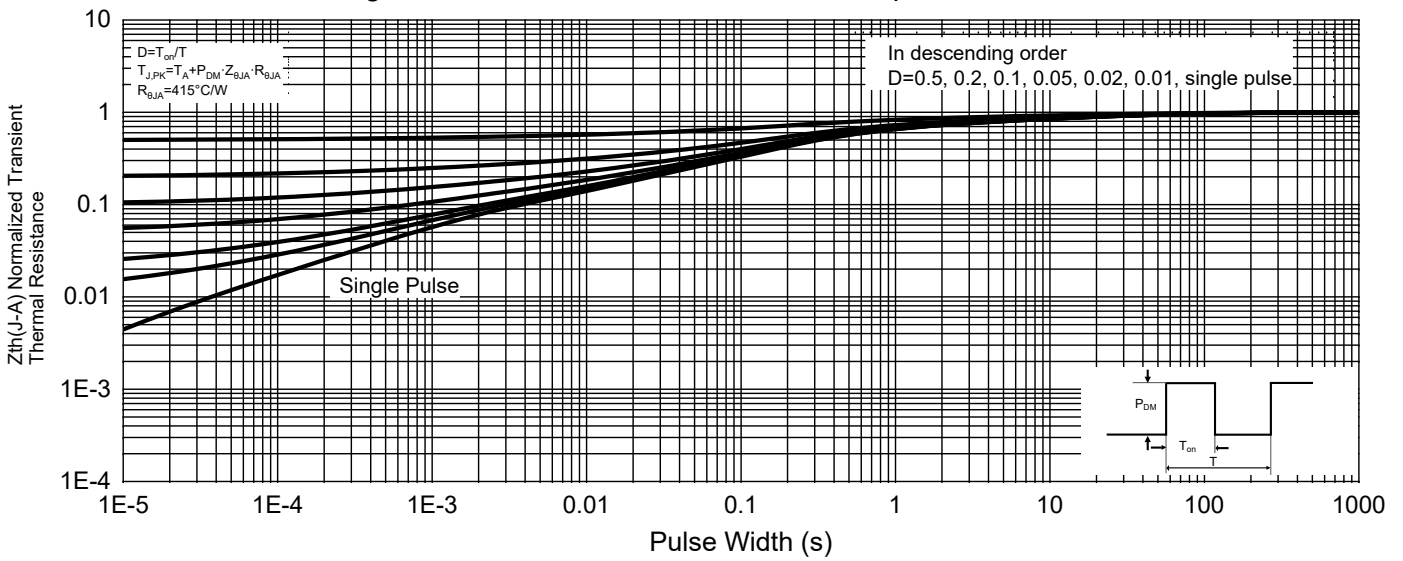


Fig. 13 -Normalized Transient Thermal Impedance



## Ordering Information

Device	Packing
Part Number-TP	Tape&Reel:3Kpcs/Reel
Part Number-TPQ2	Tape&Reel:3Kpcs/Reel

For packaging details, go to our website at <https://www.mccsemi.com/pdf/ProductPackaging/SOT-363%20Package.pdf>

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