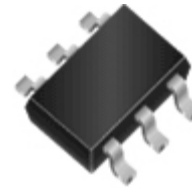
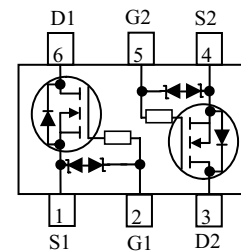


**WNMD2153**
**Dual N-Channel, 20V, 0.89A, Small Signal MOSFET**
[Http://www.willsemi.com](http://www.willsemi.com)

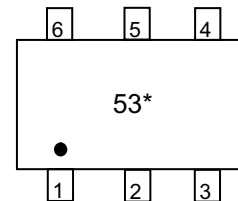
$V_{DS}$ (V)	$R_{ds(on)}$ ( $\Omega$ )
20	0.220@ $V_{GS}=4.5V$
	0.260@ $V_{GS}=2.5V$
	0.320@ $V_{GS}=1.8V$


**SOT-363**
**Descriptions**

The WNMD2153 is N-Channel enhancement MOS Field Effect Transistor. Uses advanced trench technology and design to provide excellent  $R_{DS(ON)}$  with low gate charge. This device is suitable for use in DC-DC conversion, load switch and level shift. Standard Product WNMD2153 is Pb-free.


**Pin configuration (Top view)**
**Features**

- Trench Technology
- Supper high density cell design
- Excellent ON resistance
- Extremely Low Threshold Voltage
- Small package SOT-363



53 = Device Code

\* = Month (A~Z)

**Marking**
**Applications**

- DC-DC converter circuit
- Small Signal Switch
- Load Switch
- Level Shift

**Order information**

Device	Package	Shipping
WNMD2153-6/TR	SOT-363	3000/Reel&Tape

**Absolute Maximum ratings**

Parameter		Symbol	10 S	Steady State	Unit
Drain-Source Voltage		$V_{DS}$	+20		V
Gate-Source Voltage		$V_{GS}$	$\pm 6$		
Continuous Drain Current <sup>a</sup>	$T_A=25^\circ\text{C}$	$I_D$	0.89	0.81	A
	$T_A=70^\circ\text{C}$		0.71	0.64	
Maximum Power Dissipation <sup>a</sup>	$T_A=25^\circ\text{C}$	$P_D$	0.38	0.31	W
	$T_A=70^\circ\text{C}$		0.24	0.20	
Continuous Drain Current <sup>b</sup>	$T_A=25^\circ\text{C}$	$I_D$	0.76	0.69	A
	$T_A=70^\circ\text{C}$		0.61	0.55	
Maximum Power Dissipation <sup>b</sup>	$T_A=25^\circ\text{C}$	$P_D$	0.28	0.23	W
	$T_A=70^\circ\text{C}$		0.17	0.15	
Pulsed Drain Current <sup>c</sup>		$I_{DM}$	1.4		A
Operating Junction Temperature		$T_J$	150		$^\circ\text{C}$
Lead Temperature		$T_L$	260		$^\circ\text{C}$
Storage Temperature Range		$T_{stg}$	-55 to 150		$^\circ\text{C}$

**Thermal resistance ratings**

Single Operation					
Parameter		Symbol	Typical	Maximum	Unit
Junction-to-Ambient Thermal Resistance <sup>a</sup>	$t \leq 10 \text{ s}$	$R_{\theta JA}$	276	325	$^\circ\text{C/W}$
	Steady State		328	395	
Junction-to-Ambient Thermal Resistance <sup>b</sup>	$t \leq 10 \text{ s}$	$R_{\theta JA}$	375	445	
	Steady State		446	532	
Junction-to-Case Thermal Resistance		$R_{\theta JC}$	260	300	
Dual Operation					
Junction-to-Ambient Thermal Resistance <sup>a</sup>	$t \leq 10 \text{ s}$	$R_{\theta JA}$	310	360	
	Steady State		366	432	
Junction-to-Ambient Thermal Resistance <sup>b</sup>	$t \leq 10 \text{ s}$	$R_{\theta JA}$	415	486	
	Steady State		498	575	
Junction-to-Case Thermal Resistance		$R_{\theta JC}$	265	305	

a Surface mounted on FR4 Board using 1 square inch pad size, 1oz copper

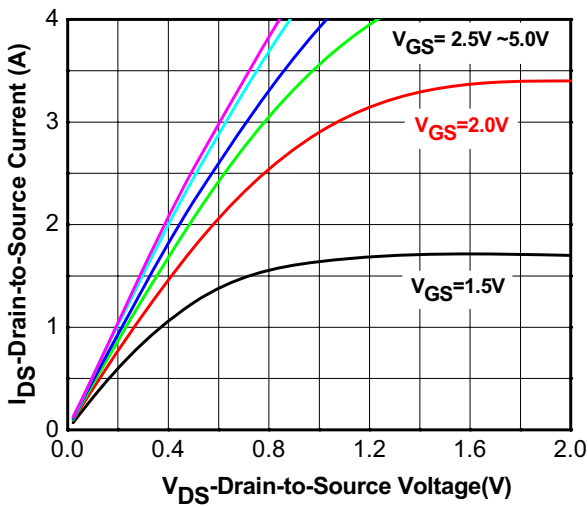
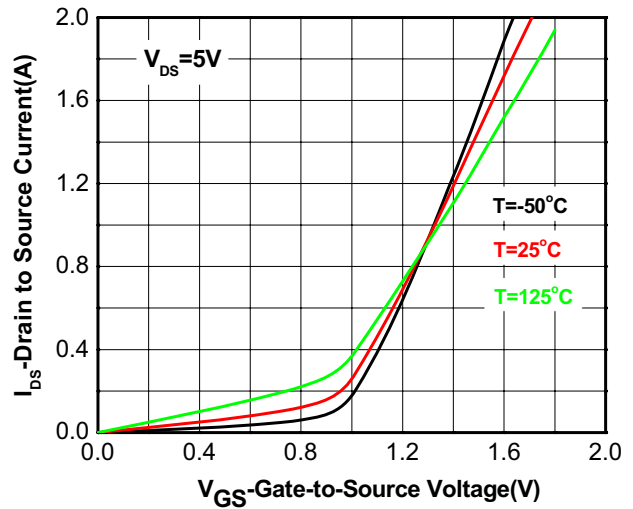
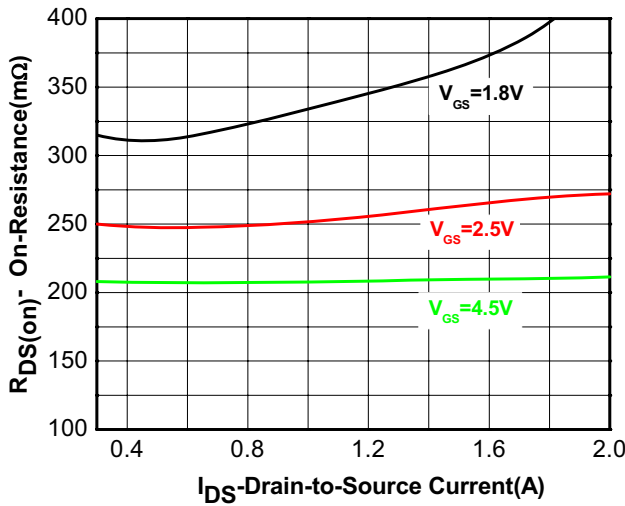
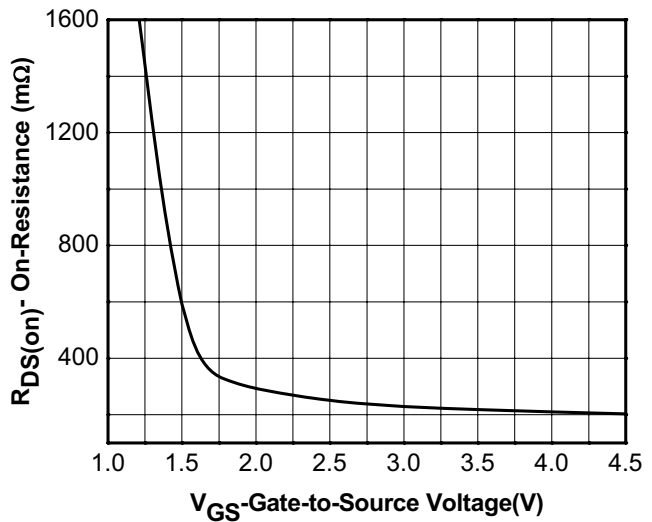
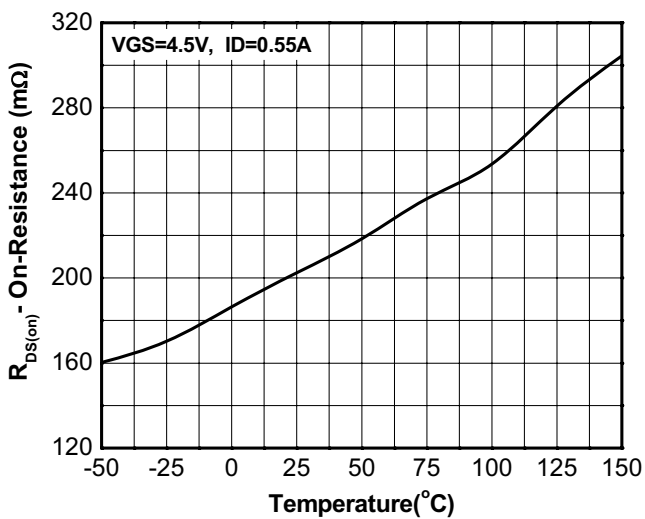
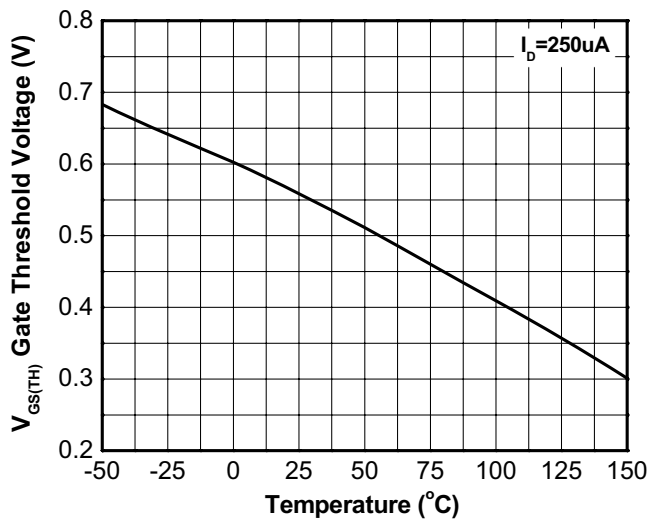
b Surface mounted on FR4 board using minimum pad size, 1oz copper

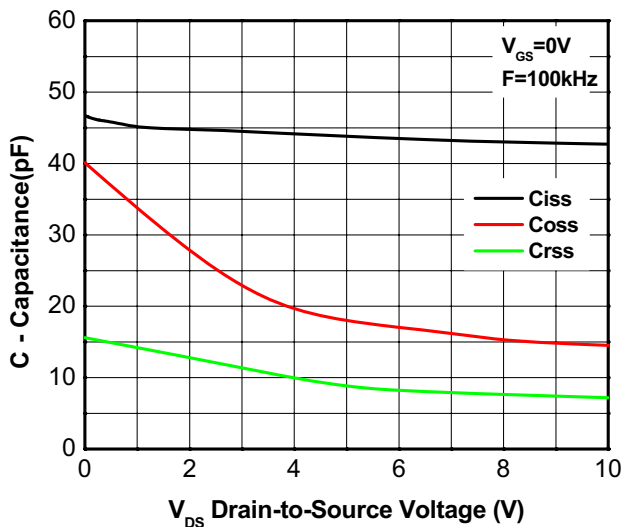
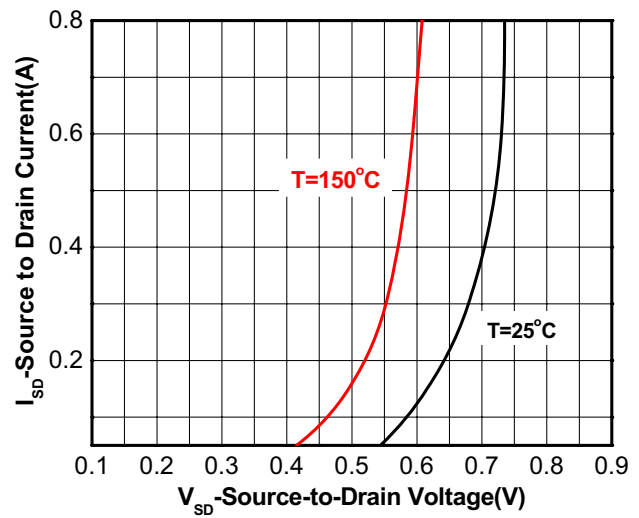
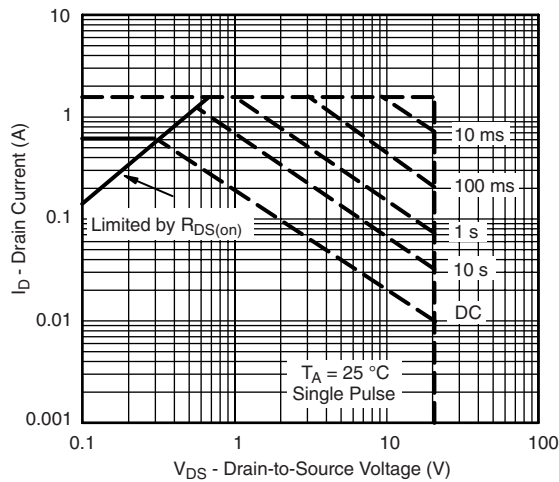
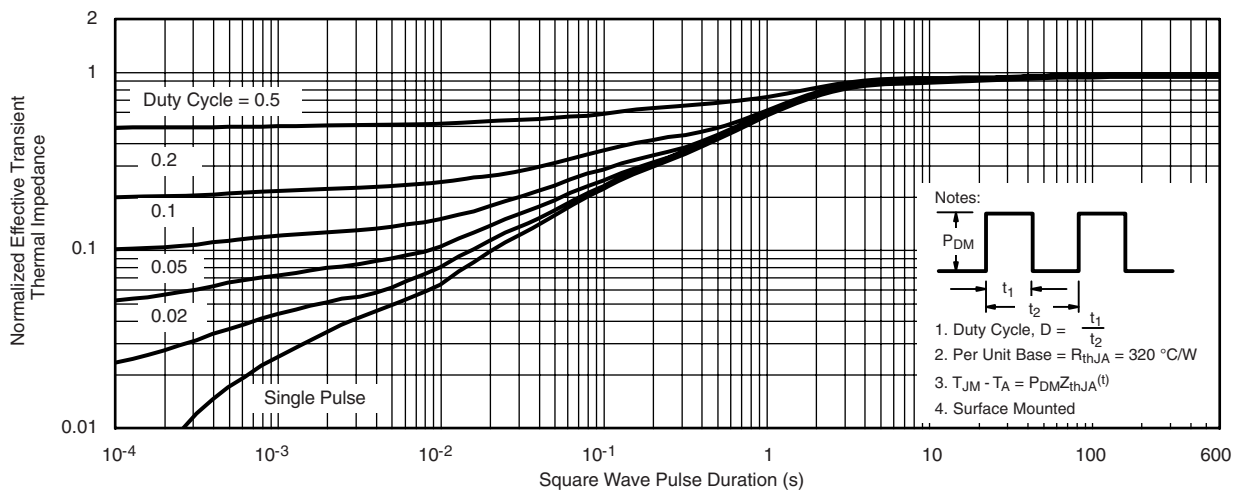
c Repetitive rating, pulse width limited by junction temperature,  $t_p=10\mu\text{s}$ , Duty Cycle=1%

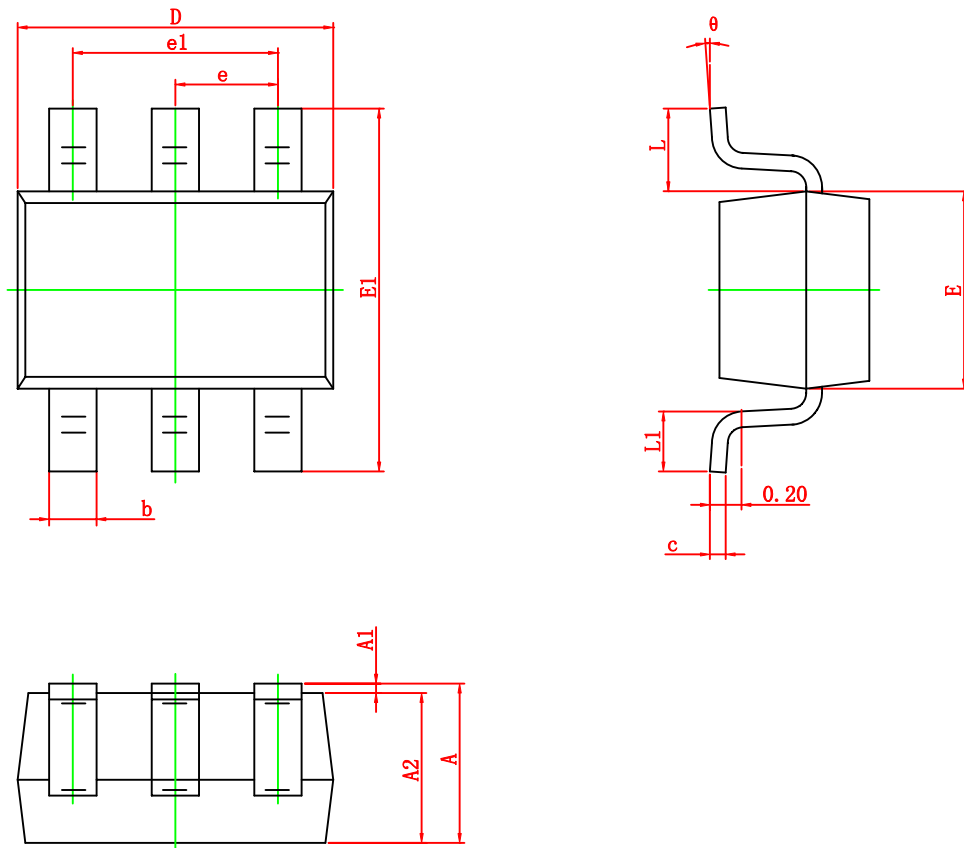
d Repetitive rating, pulse width limited by junction temperature  $T_J=150^\circ\text{C}$ .

**Electronics Characteristics (Ta=25°C, unless otherwise noted)**

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
<b>OFF CHARACTERISTICS</b>						
Drain-to-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS} = 0\text{ V}, I_D = 250\mu\text{A}$	20			V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = 16\text{ V}, V_{GS} = 0\text{ V}$			1	$\mu\text{A}$
Gate-to-source Leakage Current	$I_{GSS}$	$V_{DS} = 0\text{ V}, V_{GS} = \pm 5\text{ V}$			$\pm 5$	$\mu\text{A}$
<b>ON CHARACTERISTICS</b>						
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{GS} = V_{DS}, I_D = 250\mu\text{A}$	0.45	0.58	0.85	V
Drain-to-source On-resistance	$R_{DS(on)}$	$V_{GS} = 4.5\text{ V}, I_D = 0.55\text{ A}$		220	310	m $\Omega$
		$V_{GS} = 2.5\text{ V}, I_D = 0.45\text{ A}$		260	360	
		$V_{GS} = 1.8\text{ V}, I_D = 0.35\text{ A}$		320	460	
Forward Transconductance	$g_{FS}$	$V_{DS} = 5\text{ V}, I_D = 0.55\text{ A}$		2.0		S
<b>CHARGES, CAPACITANCES AND GATE RESISTANCE</b>						
Input Capacitance	$C_{ISS}$	$V_{GS} = 0\text{ V}, f = 100\text{ kHz}, V_{DS} = 10\text{ V}$		50		pF
Output Capacitance	$C_{OSS}$			13		
Reverse Transfer Capacitance	$C_{RSS}$			8		
Total Gate Charge	$Q_{G(TOT)}$	$V_{GS} = 4.5\text{ V}, V_{DS} = 10\text{ V}, I_D = 0.55\text{ A}$		1.15		nC
Threshold Gate Charge	$Q_{G(TH)}$			0.06		
Gate-to-Source Charge	$Q_{GS}$			0.15		
Gate-to-Drain Charge	$Q_{GD}$			0.23		
<b>SWITCHING CHARACTERISTICS</b>						
Turn-On Delay Time	$t_d(ON)$	$V_{DD} = 10\text{ V}, V_{GS} = 4.5\text{ V}, I_D = 0.55\text{ A}, R_G = 6\Omega$		22		ns
Rise Time	$t_r$			80		
Turn-Off Delay Time	$t_d(OFF)$			700		
Fall Time	$t_f$			380		
<b>BODY DIODE CHARACTERISTICS</b>						
Forward Voltage	$V_{SD}$	$V_{GS} = 0\text{ V}, I_S = 0.35\text{ A}$	0.5	0.7	1.5	V

**Typical Characteristics (Ta=25°C, unless otherwise noted)**

**Output characteristics**

**Transfer characteristics**

**On-Resistance vs. Drain current**

**On-Resistance vs. Gate-to-Source voltage**

**On-Resistance vs. Junction temperature**

**Threshold voltage vs. Temperature**


**Capacitance**

**Body diode forward voltage**

**Safe operating power**

**Transient thermal response (Junction-to-Ambient)**

**Package outline dimensions**
**SOT-363**


Symbol	Dimension in Millimeters	
	Min.	Max.
A	0.900	1.100
A1	0.000	0.100
A2	0.900	1.000
b	0.150	0.350
c	0.080	0.150
D	2.000	2.200
E	1.150	1.350
E1	2.150	2.450
e	0.650 TYP	
e1	1.200	1.400
L	0.525 REF	
L1	0.260	0.460
theta	0°	8°

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