



Description

The DMC2710UDWQ-13 uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 4.5V. This device is suitable for use as a Battery protection or in other Switching application.



SOT-363

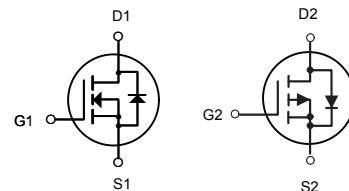
General Features

$V_{DS} = 20V$ $I_D = 0.75A$

$R_{DS(ON)} < 380m\Omega$ @ $V_{GS}=4.5V$

$V_{DS} = -20V$ $I_D = -0.66A$

$R_{DS(ON)} < 570m\Omega$ @ $V_{GS}=-4.5V$



N-Channel MOSFET P-Channel MOSFET

Application

Wireless charging

Boost driver

Brushless motor

Package Marking and Ordering Information

Product ID	Pack	Brand	Qty(PCS)
DMC2710UDWQ-13	SOT-363	HXY MOSFET	3000

Absolute Maximum Ratings ($T_c=25^\circ C$ unless otherwise noted)

Symbol	Parameter	Rating		Units
		N-Channel	P-Channel	
V _{DS}	Drain-Source Voltage	20	-20	V
V _{GS}	Gate-Source Voltage	± 12	± 12	V
I _D @ $T_A=25^\circ C$	Continuous Drain Current, $V_{GS} @ 10V^1$	0.75	-0.66	A
I _{DM}	Pulsed Drain Current ²	1.8	-1.2	A
T _{TSG}	Storage Temperature Range	-55 to 150	-55 to 150	°C
T _J	Operating Junction Temperature Range	-55 to 150	-55 to 150	°C
R _{θJA}	Thermal Resistance Junction-Ambient ¹	833		°C/W



N-ch MOSFET Electrical Characteristics ($T_a=25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Static Characteristics						
Drain-source breakdown voltage	$V_{(\text{BR})\text{DSS}}$	$V_{\text{GS}} = 0\text{V}, I_{\text{D}} = 250\mu\text{A}$	20			V
Zero gate voltage drain current	I_{DSS}	$V_{\text{DS}} = 20\text{V}, V_{\text{GS}} = 0\text{V}$			1	μA
Gate-body leakage current	I_{GSS}	$V_{\text{GS}} = \pm 10\text{V}, V_{\text{DS}} = 0\text{V}$			± 20	μA
Gate threshold voltage (note 2)	$V_{\text{GS}(\text{th})}$	$V_{\text{DS}} = V_{\text{GS}}, I_{\text{D}} = 250\mu\text{A}$	0.35		1.1	V
Drain-source on-resistance(note 2)	$R_{\text{DS}(\text{on})}$	$V_{\text{GS}} = 4.5\text{V}, I_{\text{D}} = 0.65\text{A}$		210	380	$\text{m}\Omega$
		$V_{\text{GS}} = 2.5\text{V}, I_{\text{D}} = 0.55\text{A}$		320	450	$\text{m}\Omega$
		$V_{\text{GS}} = 1.8\text{V}, I_{\text{D}} = 0.45\text{A}$		390	800	$\text{m}\Omega$
Forward transconductance(note 2)	g_{FS}	$V_{\text{DS}} = 10\text{V}, I_{\text{D}} = 0.8\text{A}$		1.6		S
Diode forward voltage	V_{SD}	$I_{\text{S}} = 0.15\text{A}, V_{\text{GS}} = 0\text{V}$			1.2	V
Dynamic Characteristics (note 4)						
Input Capacitance	C_{iss}	$V_{\text{DS}} = 16\text{V}, V_{\text{GS}} = 0\text{V}, f = 1\text{MHz}$		79	120	pF
Output Capacitance	C_{oss}			13	20	pF
Reverse Transfer Capacitance	C_{rss}			9	15	pF
Switching Characteristics (note 3,4)						
Turn-on delay time	$t_{\text{d}(\text{on})}$	$V_{\text{GS}} = 4.5\text{V}, V_{\text{DS}} = 10\text{V}, I_{\text{D}} = 500\text{mA}, R_{\text{GEN}} = 10\Omega$		6.7		ns
Turn-on rise time	t_{r}			4.8		ns
Turn-off delay time	$t_{\text{d}(\text{off})}$			17.3		ns
Turn-off fall time	t_{f}			7.4		ns

P-ch MOSFET Electrical Characteristics ($T_a=25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Static Characteristics						
Drain-source breakdown voltage	$V_{(\text{BR})\text{DSS}}$	$V_{\text{GS}} = 0\text{V}, I_{\text{D}} = -250\mu\text{A}$	-20			V
Zero gate voltage drain current	I_{DSS}	$V_{\text{DS}} = -20\text{V}, V_{\text{GS}} = 0\text{V}$			-1	μA
Gate-body leakage current	I_{GSS}	$V_{\text{GS}} = \pm 10\text{V}, V_{\text{DS}} = 0\text{V}$			± 20	μA
Gate threshold voltage (note 2)	$V_{\text{GS}(\text{th})}$	$V_{\text{DS}} = V_{\text{GS}}, I_{\text{D}} = -250\mu\text{A}$	-0.35		-1.1	V
Drain-source on-resistance(note 2)	$R_{\text{DS}(\text{on})}$	$V_{\text{GS}} = -4.5\text{V}, I_{\text{D}} = -1\text{A}$		430	570	$\text{m}\Omega$
		$V_{\text{GS}} = -2.5\text{V}, I_{\text{D}} = -0.8\text{A}$		624	700	$\text{m}\Omega$
		$V_{\text{GS}} = -1.8\text{V}, I_{\text{D}} = -0.5\text{A}$		950		$\text{m}\Omega$
Forward transconductance(note 2)	g_{FS}	$V_{\text{DS}} = -10\text{V}, I_{\text{D}} = -0.54\text{A}$		1.2		S
Diode forward voltage	V_{SD}	$I_{\text{S}} = -0.5\text{A}, V_{\text{GS}} = 0\text{V}$			-1.2	V
Dynamic Characteristics (note 4)						
Input Capacitance	C_{iss}	$V_{\text{DS}} = -16\text{V}, V_{\text{GS}} = 0\text{V}, f = 1\text{MHz}$		113	170	pF
Output Capacitance	C_{oss}			15	25	pF
Reverse Transfer Capacitance	C_{rss}			9	15	pF
Switching Characteristics (note 3, 4)						
Turn-on delay time	$t_{\text{d}(\text{on})}$	$V_{\text{GS}} = -4.5\text{V}, V_{\text{DS}} = -10\text{V}, I_{\text{D}} = -200\text{mA}, R_{\text{GEN}} = 10\Omega$		9		ns
Turn-on rise time	t_{r}			5.8		ns
Turn-off delay time	$t_{\text{d}(\text{off})}$			32.7		ns
Turn-off fall time	t_{f}			20.3		ns

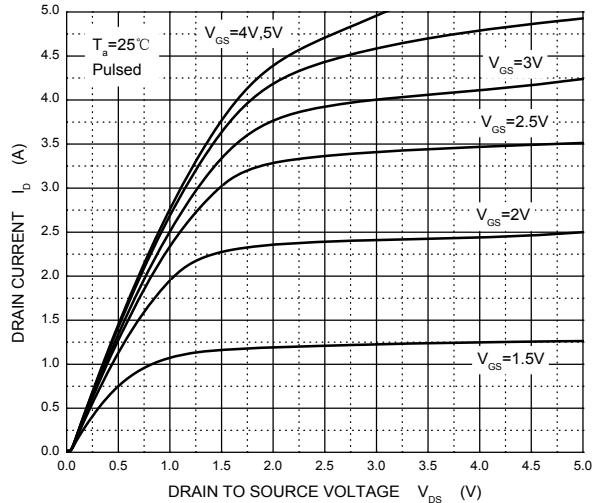
Notes :

1. Surface mounted on FR4 board using the minimum recommended pad size.
2. Pulse Test : Pulse width=300 μs , duty cycle $\leq 2\%$.
3. Switching characteristics are independent of operating junction temperature.
4. Guaranteed by design, not subject to producting.

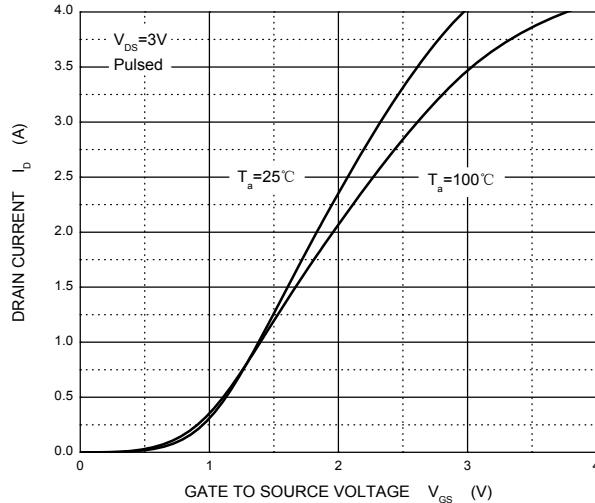


N-Channel Typical Characteristics

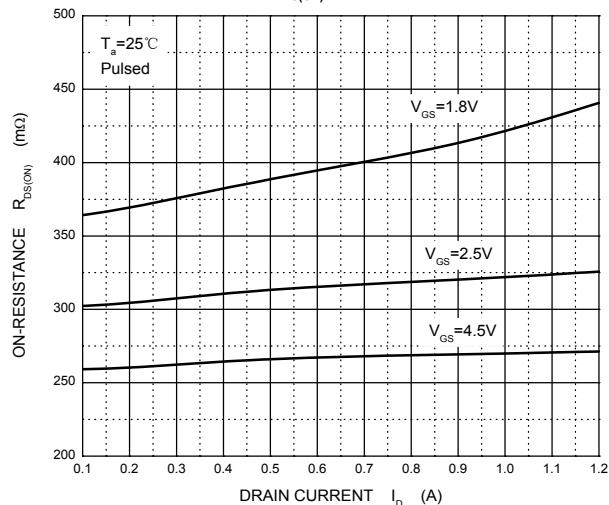
Output Characteristics



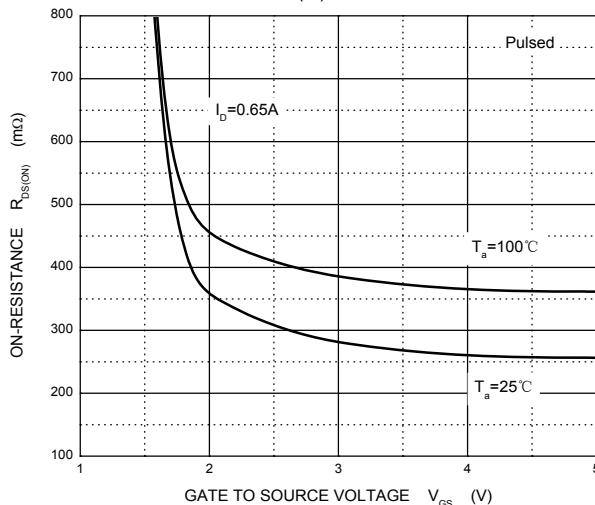
Transfer Characteristics



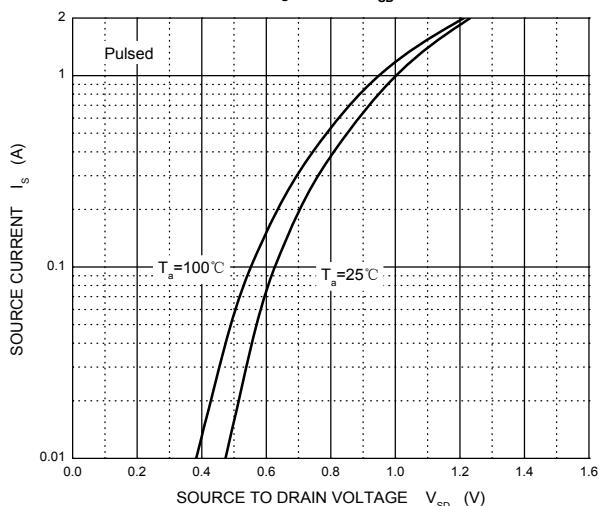
$R_{DS(ON)}$ — I_D



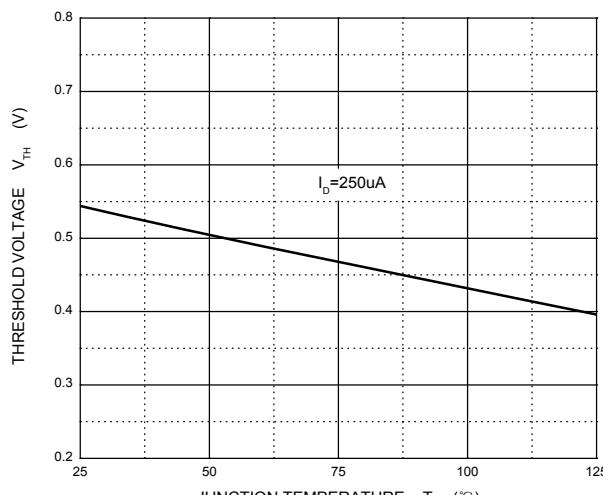
$R_{DS(ON)}$ — V_{GS}



I_s — V_{SD}



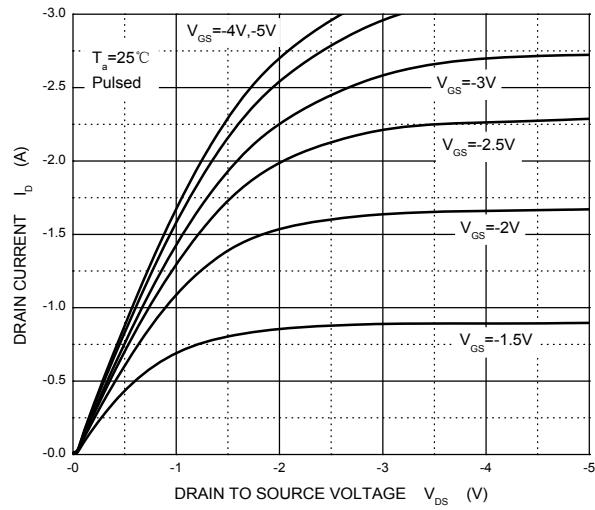
Threshold Voltage



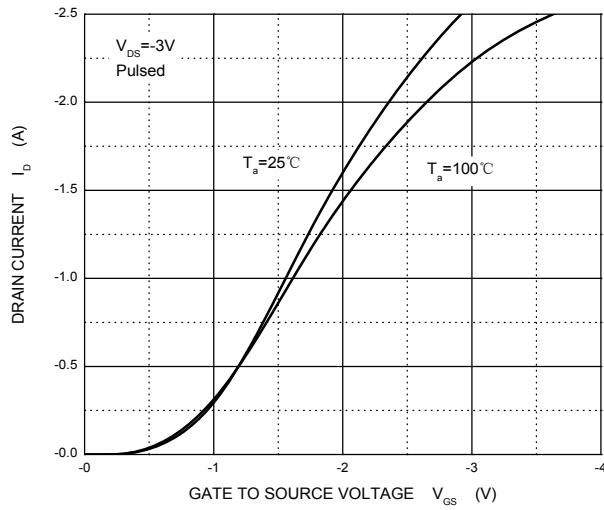


P-Channel Typical Characteristics

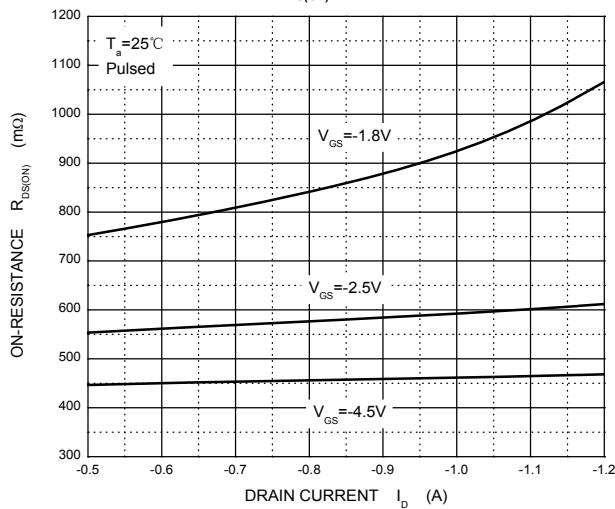
Output Characteristics



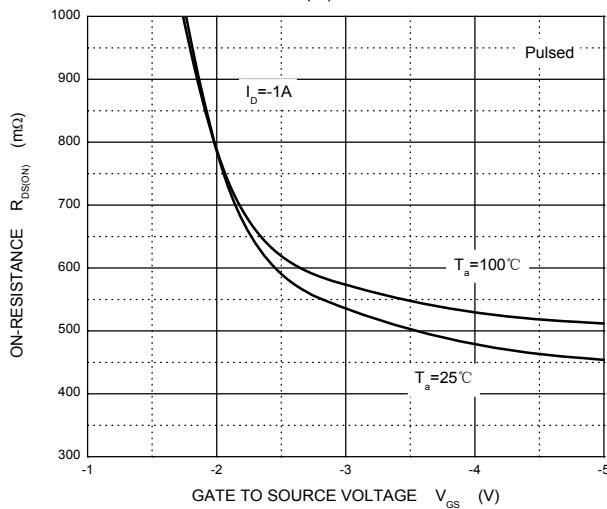
Transfer Characteristics



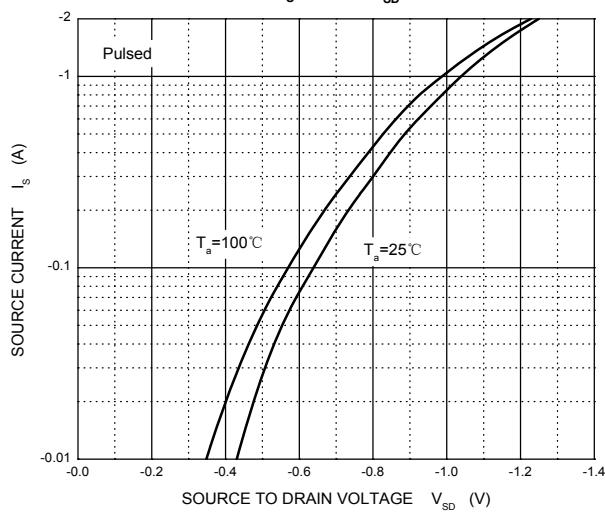
$R_{DS(ON)}$ — I_D



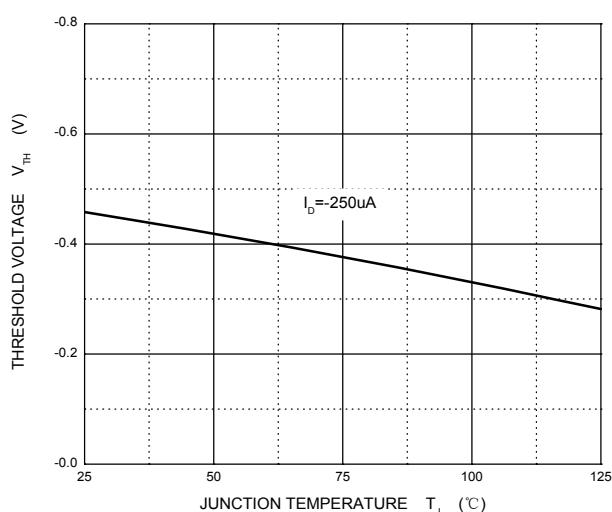
$R_{DS(ON)}$ — V_{GS}



I_s — V_{SD}

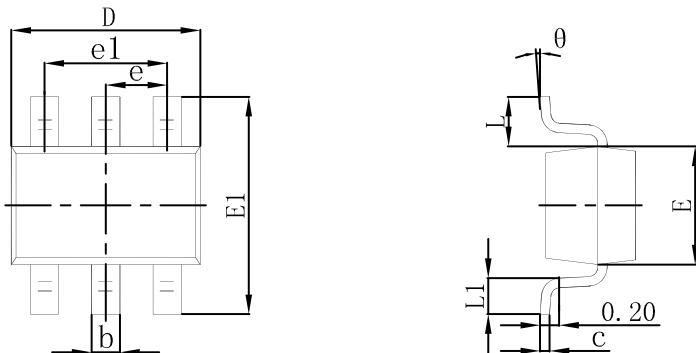


Threshold Voltage



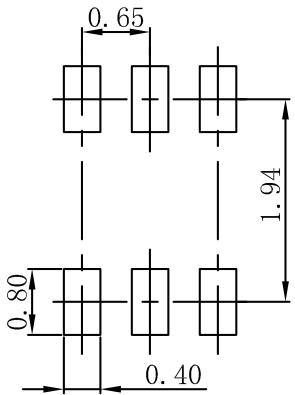


SOT-363 Package Outline Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.100	0.035	0.043
A1	0.000	0.100	0.000	0.004
A2	0.900	1.000	0.035	0.039
b	0.150	0.350	0.006	0.014
c	0.100	0.150	0.004	0.006
D	2.000	2.200	0.079	0.087
E	1.150	1.350	0.045	0.053
E1	2.150	2.400	0.085	0.094
e	0.650 TYP		0.026 TYP	
e1	1.200	1.400	0.047	0.055
L	0.525 REF		0.021 REF	
L1	0.260	0.460	0.010	0.018
θ	0°	8°	0°	8°

SOT-363 Suggested Pad Layout



Note:

1. Controlling dimension:in millimeters.
- 2.General tolerance: ± 0.05 mm.
- 3.The pad layout is for reference purposes only.



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