UMW NTF2955T1G

-60V P-Channel MOSFET

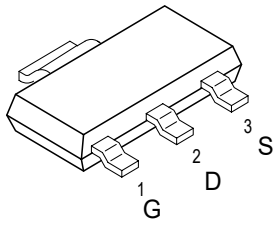
1.Features

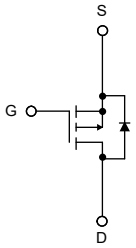
- $V_{DS(V)}$=-60V
- I_D=-7A(V_{GS}=-10V)
- I_D=-6A(V_{GS}=-4.5V)
- $R_{DS(ON)}$<55mΩ(V_{GS}=-10V)
- $R_{DS(ON)}$<65mΩ(V_{GS}=-4.5V)

2.Pinning information

Pin	Symbol	Description
1	G	GATE
2	D	DRAIN
3	S	SOURCE

SOT-223





3.Maximum ratings (T_A=25°C unless otherwise noted)

Parameter		Symbol	Maximum	Units
Drain-Source Voltage		V_{DS}	-60	V
Gate-Source Voltage		V_{GS}	±20	
Continuous DrainCurrent (T_J = 150 °C)	T_C=25°C	I_D	-7 [a]	A
	T_C=70°C		-5.2	
	T_A=25°C		-4.8 [b]	
	T_A=70°C		-4.1	
Pulsed Drain Current		I_{DM}	-25	
Avalanche Current Pulse	L = 0.1 mH	I_{AS}	-4.5	
Single Pulse Avalanche Energy		E_{AS}	10.1	mJ
Continuous Source-Drain Diode Current	T_C=25°C	I_S	6.9 [a]	A
	T_A=25°C		3.5 [b]	

Maximum Power Dissipation	T_C=25°C	P_D	10.4 [a]	W
	T_C=70°C		6.6 [a]	
	T_A=25°C		2.1 [b]	
	T_A=70°C		1.1 [b]	
Storage Temperature Range		T_J,T_{STG}	-55 to 150	°C

4.Thermal resistance rating

Parameter		Symbol	Typ	Max	Units
Maximum Junction-to-Ambient [b]	Steady-State	R_{thJA}	33	40	°C/W
Maximum Junction-to-Case	Steady-State	R_{thJC}	0.98	1.2	°C/W

Notes:

a. Based on T_C=25 °C.

b. Surface mounted on 1" x 1" FR4 board.

5.T_J=25°C unless otherwise specified

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Static						
Drain-Source Breakdown Voltage	V_{DS}	V_{GS}=0V, I_D=-250μA	-60			V
V_{DS} Temperature Coefficient	$\Delta V_{DS}/T_J$	I_D=-250μA		68		mV/°C
$V_{GS(th)}$ Temperature Coefficient	$\Delta V_{GS(th)}/T_J$			-5.2		
Gate-Source Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=-250μA	-1		-2.5	V
Gate-Source Leakage	I_{GSS}	V_{DS}=0V, V_{GS}=±20V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=-60V, V_{GS}=0V			-1	μA
		V_{DS}=-60V, V_{GS}=0V, T_J=55°C			-10	
On-State Drain Current[a]	$I_{D(ON)}$	V_{DS}=-5V, V_{GS}=-10V	-25			A
Drain-Source On-State Resistance[a]	$R_{DS(ON)}$	V_{GS}=-10V, I_D=-3A		55		mΩ
		V_{GS}=-4.5V, I_D=-2A		65		
Forward Transconductance[a]	g_{FS}	V_{DS}=-15V, I_D=-5A	20			S
Dynamic [b]						
Input Capacitance	C_{iss}	V_{DS}=-25V, V_{GS}=0V, f=1MHz		1500		pF
Output Capacitanc	C_{oss}			200		
Reverse Transfer Capacitance	C_{rss}			150		
Total Gate Charge	Q_g	V_{DS}=-30V,V_{GS}=-10V		38	56	nC
		I_D=-5A		19	30	
Gate Source Charge	Q_{gs}	V_{DS}=-30V, V_{GS}=-4.5V		9		
Gate Drain Charge	Q_{gd}	I_D=-5A		10		
Gate Resistance	R_g	f=1MHz		5.2		Ω
Turn-On DelayTime	$t_{D(on)}$	V_{DD} =-2V, R_L=2Ω		10	15	ns
Rise Time	t_r	I_D≅-5A, V_{GEN}=-10V		7	15	
Turn-Off DelayTime	$t_{D(off)}$	R_g=1Ω		70	110	
Fall Time	t_f			40	60	

Drain-Source Body Diode Characteristics						
Continuous Source-Drain Diode Current	I_S	T_C=25°C			-6.9	A
Pulse Diode Forward Current	I_{SM}				-15	A
Body Diode Voltage	V_{SD}	I_S=-3A		-1	-1.5	V
Body Diode Reverse Recovery Time	t_{rr}	I_F=-5A, dI/dt=10A/μs T_J=25°C		45	68	ns
Body Diode Reverse Recovery Charge	Q_{rr}			59	120	nC
Reverse Recovery Fall Time	t_a			29		ns
Reverse Recovery Rise Time	t_b			16		ns

Notes:

a. Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2 %.

b. Guaranteed by design, not subject to production testing.

Stresses beyond those listed under “Absolute Maximum Ratings” may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

6.1Typical Characterisitics

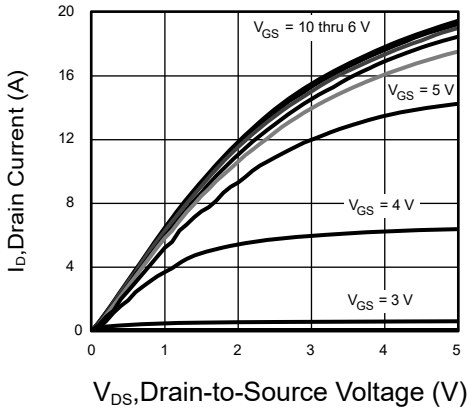


Figure 1: Output Characteristics

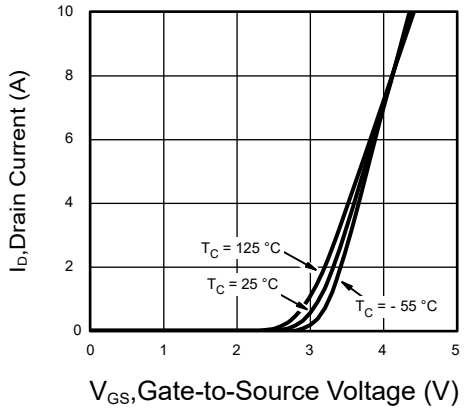


Figure 2: Transfer Characteristics

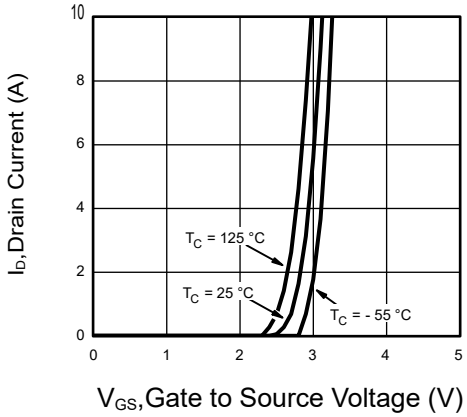


Figure 3: Transfer Characteristics

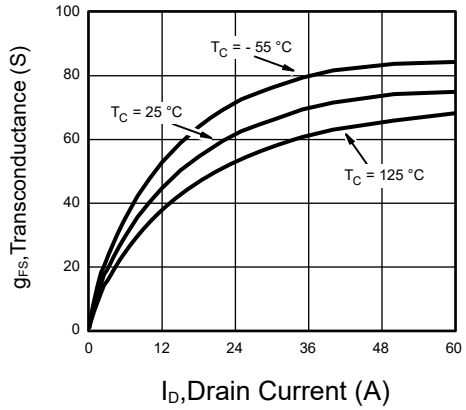


Figure 4: Transconductance

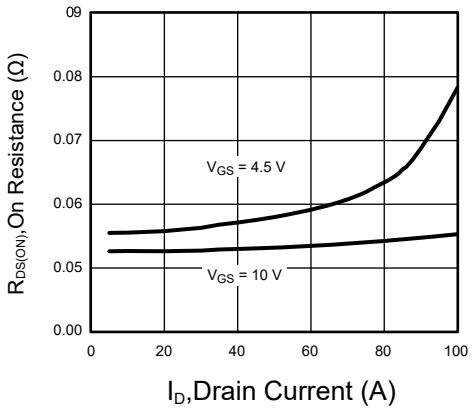


Figure 5: On-Resistance vs. Drain Current

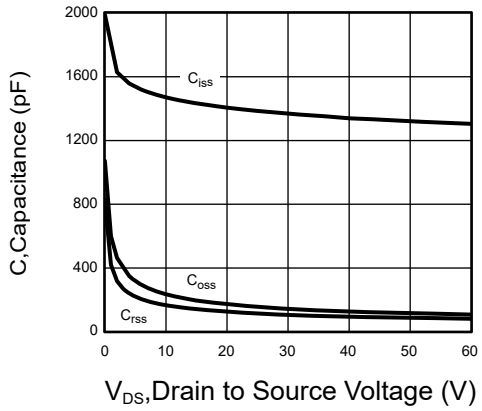


Figure 6: Capacitance

6.2Typical Characterisitics

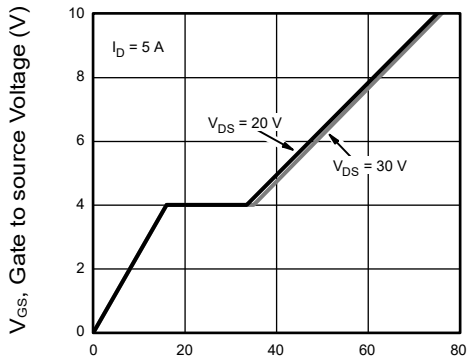


Figure 7: Gate Charge

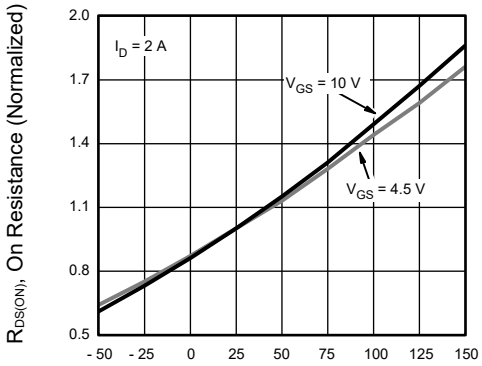


Figure 8: On-Resistance vs. Gate-to-Source Voltage

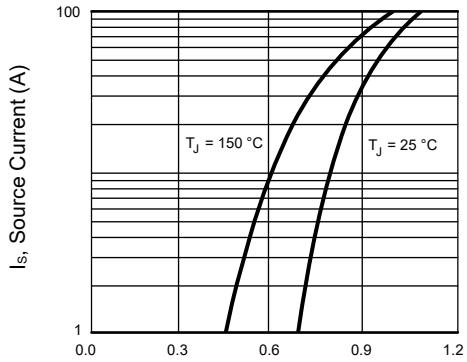


Figure 9: Source-Drain Diode Forward Voltage

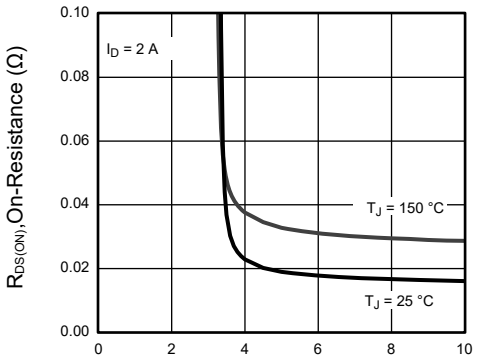


Figure 10: On-Resistance vs. Gate-to-Source Voltage

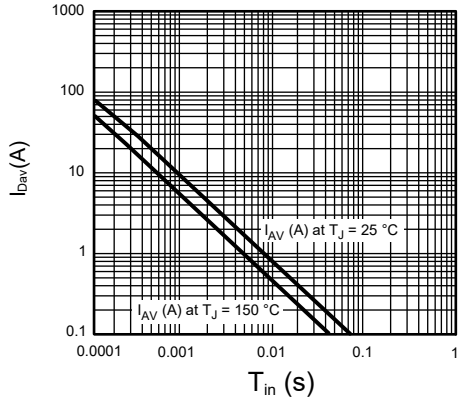


Figure 11: Single Pulse Avalanche Current Capability vs. Time

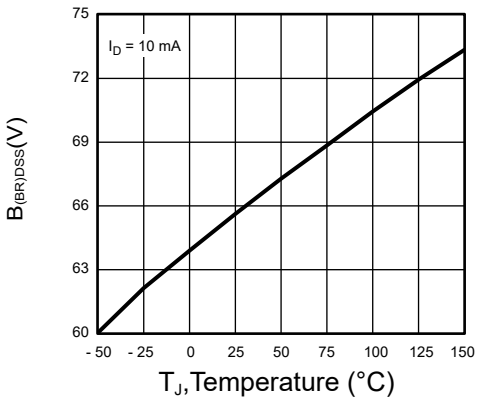


Figure 12: Drain-Source Breakdown Voltage vs. Junction Temperature

6.3Typical Characterisitics

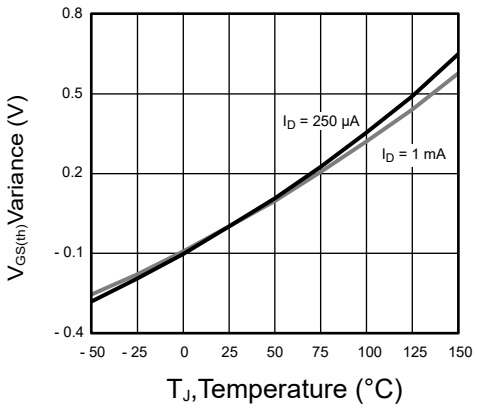


Figure 13: Threshold Voltage

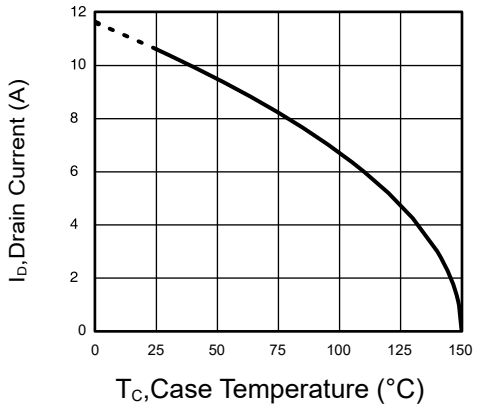


Figure 14: Max. Drain Current vs. Case Temperature

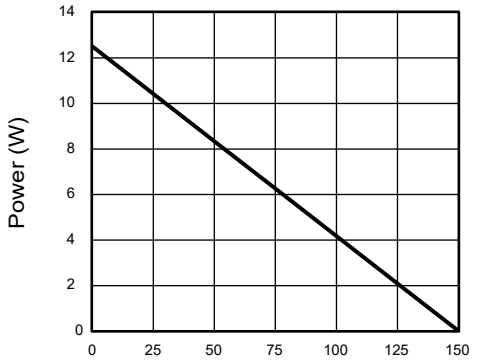
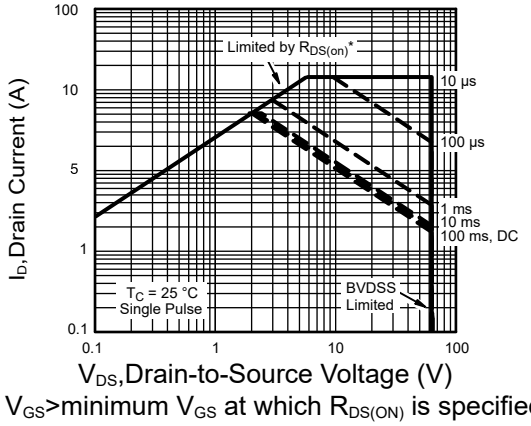


Figure 15: Power Derating, Junction-to-Case



* V_{GS}>minimum V_{GS} at which $R_{DS(ON)}$ is specified

Figure 16: Safe Operating Area, Junction-to-Case

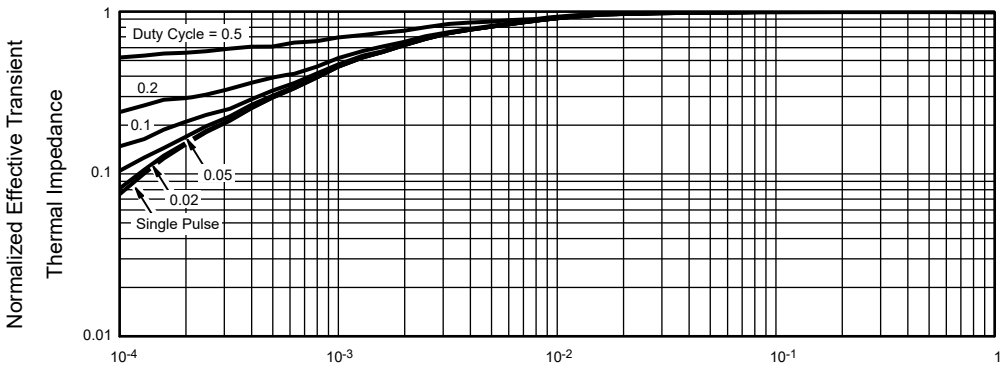
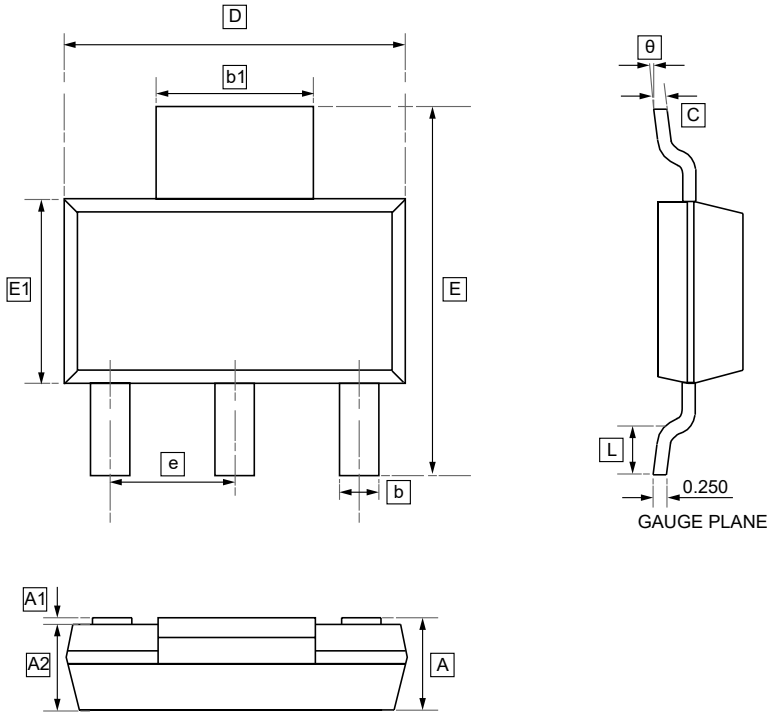


Figure 17: Normalized Thermal Transient Impedance, Junction-to-Case

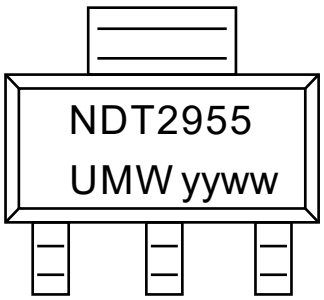
7.SOT-223 Package Outline Dimensions



DIMENSIONS (mm are the original dimensions)

Symbol	A	A1	A2	b	b1	c	D	E	E1	e	L	θ
Min	-	0.020	1.500	0.660	2.900	0.230	6.300	6.700	3.300	2.300	0.750	0°
Max	1.800	0.100	1.700	0.840	3.100	0.350	6.700	7.300	3.700	BSC	-	10°

8.Ordering information



yy: Year Code
ww: Week Code

Order Code	Package	Base QTY	Delivery Mode
UMW NTF2955T1G	SOT-223	2500	Tape and reel

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