UMW IRLR8726TR

30V N-Channel MOSFET

1.Features

- $V_{DS\ (V)}$=30V
- $R_{DS(ON)}$<5.8mΩ(V_{GS}=10V)
- $R_{DS(ON)}$<8mΩ(V_{GS}=4.5V)

2.Benefits

- Very Low $R_{DS(ON)}$ at 4.5V V_{GS}
- Ultra-Low Gate Impedance
- Fully Characterized Avalanche Voltage and Current

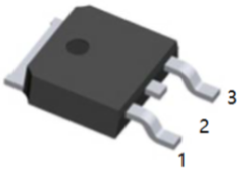
3.Applications

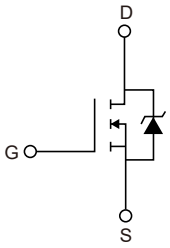
- High Frequency Isolated DC-DC Converters with Synchronous Rectification for Telecom and Industrial Use
- High Frequency Synchronous Buck Converters for Computer Processor Power

4.Pinning information

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

TO-252(DPAK)
top view





5.Absolute Maximum Ratings

Parameter		Symbol	Rating	Units
Drain- Source Voltage		V_{DS}	30	V
Gate-to-Source Voltage		V_{GS}	±20	V
Continuous Drain Current, V_{GS}=10V	T_C=25°C	I_D	86 ④	A
Continuous Drain Current, V_{GS}=10V	T_C=100°C		61 ④	A
Pulsed Drain Current ①		I_{DM}	340	A
Maximum Power Dissipation ⑥	T_C=25°C	P_D	75	W
Maximum Power Dissipation ⑥	T_C=100°C		38	W
Linear Derating Factor			0.5	W/°C
Operating Junction and Storage Temperature Range		T_J, T_{STG}	-55 to 175	°C
Soldering Temperature, for 10 seconds			300 (1.6mm from case)	°C

6.Thermal resist ance rating

Parameter	Symbol	Typ	Max	Units
Junction-to-Case ⑥	$R_{\theta JC}$		2	°C/W
Junction-to-Ambient (PCB Mounted) ⑤	$R_{\theta JA}$		50	°C/W
Junction-to-Ambient	$R_{\theta JL}$		110	°C/W

Notes:

① Repetitive rating; pulse width limited by max. junction temperature.

② Starting T_J=25°C, L=10.605mH, R_G=25Ω, I_{AS}=-20A.

③ Pulse width ≤ 400μs; duty cycle ≤ 2%.

④ Calculated continuous current based on maximum allowable junction temperature. Package limitation current is 50A.

⑤ When mounted on 1" square PCB (FR-4 or G-10 Material).For recommended footprint and soldering techniques refer to application note #AN-994.

⑥ Rθ is measured at T_J, approximately at 90°C.

7.Electrical Characteristics @ T_J= 25°C (unless otherwise specified)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Static						
Drain-Source Breakdown Voltage	BV_{DSS}	I_D=250μA, V_{GS}=0V	30			V
Breakdown Voltage Temp. Coefficient	$\Delta BV_{DSS}/\Delta T_J$	I_D=1mA,Reference to 25°C		20		mV/°C
Static Drain-to-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=25A ③		4	5.8	mΩ
		V_{GS}=4.5V, I_D=20A ③		5.8	8	
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=50μA	1.35	1.8	2.35	V
Gate Threshold Voltage Coefficient	$\Delta V_{GS(th)}/\Delta T_J$			-8.6		mV/°C
Drain-to-Source Leakage Current	I_{DSS}	V_{DS}=24V, V_{GS}=0V			1	μA
		V_{DS}=24V, V_{GS}=0V, T_J=125°C			150	μA
Gate-to-Source Forward Leakage	I_{GSS}	V_{GS}=20V			100	nA
Gate-to-Source Reverse Leakage		V_{GS}=-20V			-100	nA
Forward Transconductance	g_{FS}	V_{DS}=15V, I_D=20A	73			S
Total Gate Charge	Q_g	V_{DS}=15V, V_{GS}=4.5V I_D=20A, See Fig. 15		15	23	nC
Pre-Vth Gate-to-Source Charge	Q_{gs1}			3.7		nC
Post-Vth Gate-to-Source Charge	Q_{gs2}			1.9		nC
Gate-to-Drain Charge	Q_{gd}			5.7		nC
Gate Charge Overdrive	Q_{gdor}			3.7		nC
Switch Charge (Q_{gs2} + Q_{gd})	Q_{sw}			7.6		nC
Output Charge	Q_{oss}	V_{DS}=15V, V_{GS}=0V		10		nC
Gate Resistance	R_g			2	3.5	Ω
Turn-On Delay Time	$t_{D(on)}$	V_{DD}=15V, V_{GS}=4.5V ③ I_D=20A, R_G=1.8Ω See Fig.13		12		ns
Rise Time	t_r			49		ns
Turn-Off Delay Time	$t_{D(off)}$			15		ns
Fall Time	t_f			16		ns
Input Capacitance	C_{iss}	V_{GS}=4.5V, V_{DS}=15V f = 1.0MHz		2150		pF
Output Capacitance	C_{oss}			480		pF
Reverse Transfer Capacitance	C_{rss}			205		pF

Avalanche Characteristics						
Single Pulse Avalanche Energy ②	E_{AS}				120	mJ
Avalanche Current ①	I_{AR}				20	A
Diode Characteristics						
Continuous Source Current (Body Diode)	I_S	MOSFET symbol showing the integral reverse p-n junction diode.			86④	A
Pulsed Source Current (Body Diode) ①	I_{SM}				340	
Diode Forward Voltage	V_{SD}	T_J=25°C,I_S=20A,V_{GS}=0V ③			1	V
Reverse Recovery Time	t_{rr}	T_J=25°C, I_F=20A, V_{DD}=15V dI/dt=300A/μs ③		24	36	ns
Reverse Recovery Charge	Q_{rr}			52	78	nC

8.1Typical Characterisitics

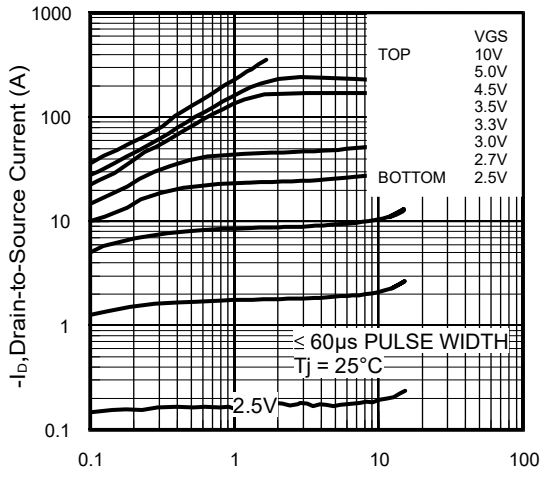


Figure 1: Typical Output Characteristics

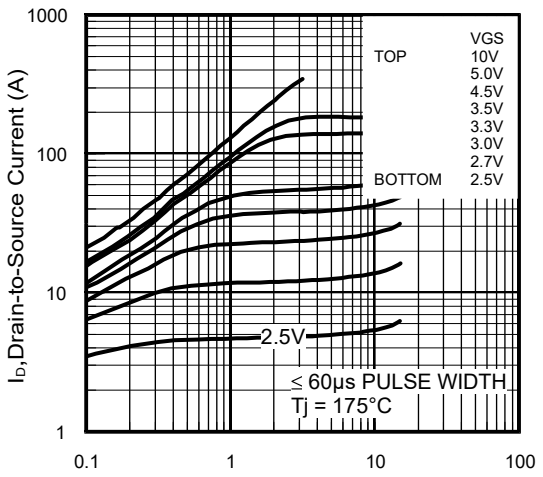


Figure 2: Typical Output Characteristics

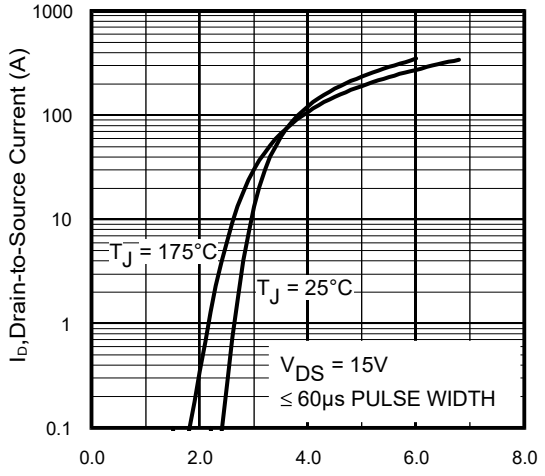


Figure 3: Typical Transfer Characteristics

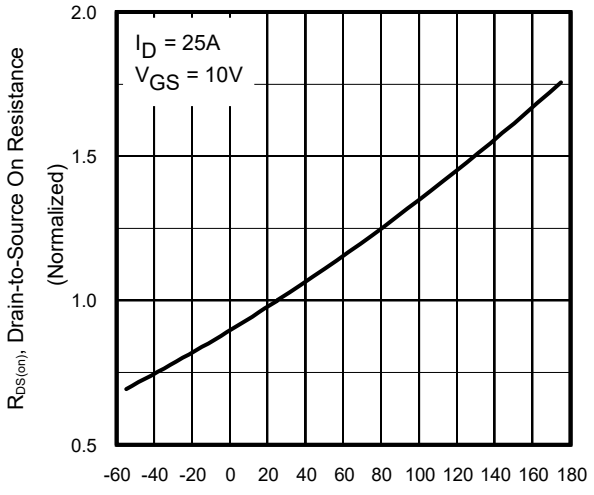
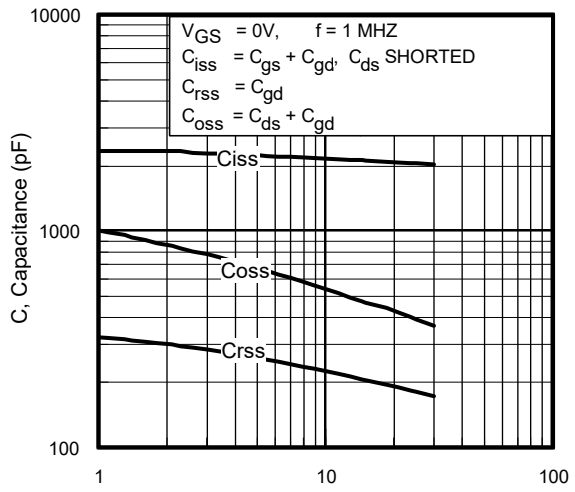


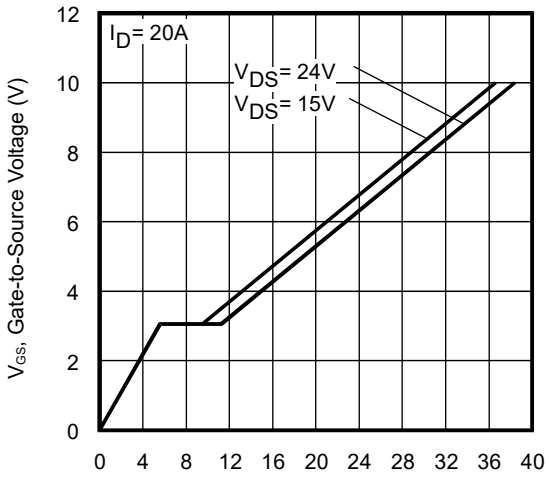
Figure 4: Nomalized On-ResistanceVs. Temperature

8.2Typical Characterisitics



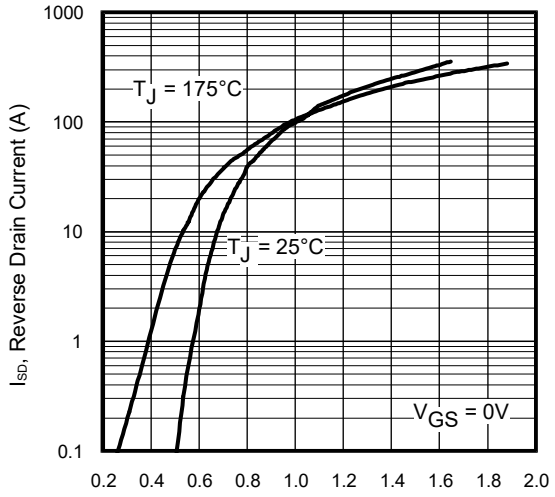
V_{DS} ,Drain-to-Source Voltage (V)

Figure 5: Typical Capacitance Vs. Drain-to-Source Voltage



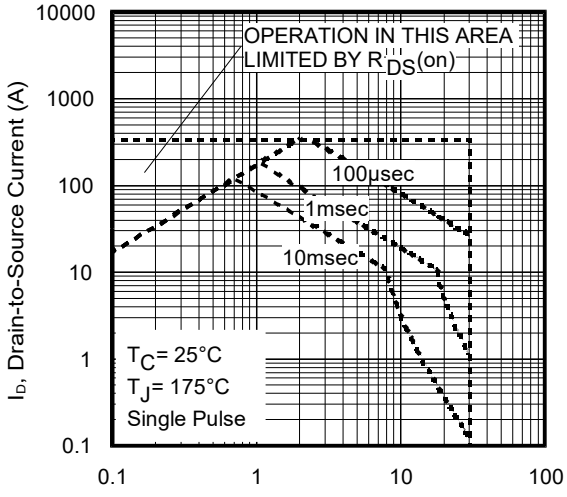
Q_G, Total Gate Charge (nC)

Figure 6: Typical Gate Charge Vs. Gate-to-Source Voltage



V_{SD}, Source-to-Drain Voltage (V)

Figure 7: Typical Source-Drain Diode Forward Voltage



V_{DS}, Drain-to-Source Voltage (V)

Figure 8: Maximum Safe Operating Area

8.3Typical Characterisitics

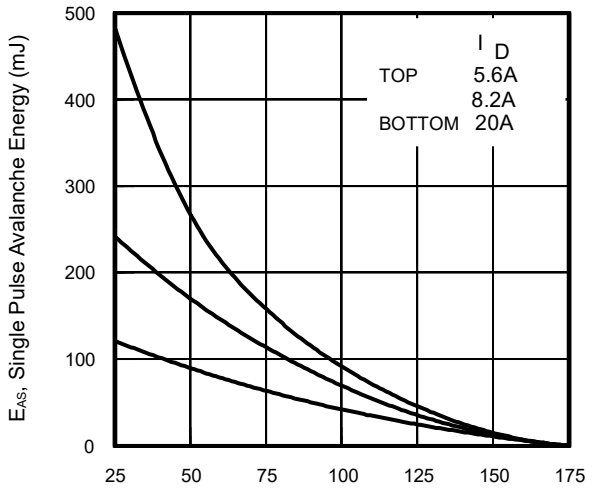


Figure 9: Maximum Avalanche Energy Vs. Drain Current

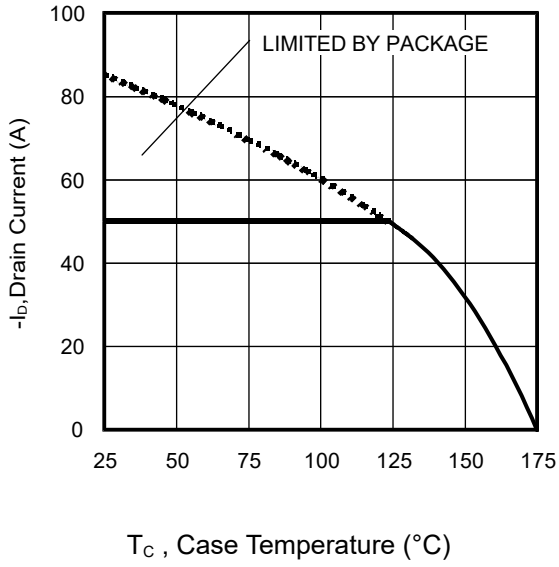


Figure 10: Maximum Drain Current vs. Case Temperature

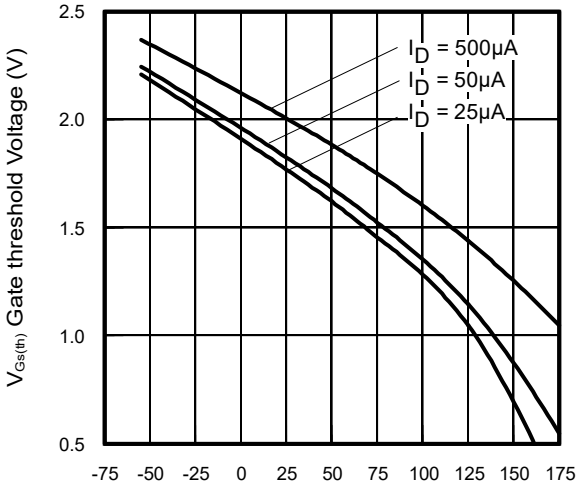


Figure 11: Threshold Voltage vs. Temperature

8.4Typical Characterisitics

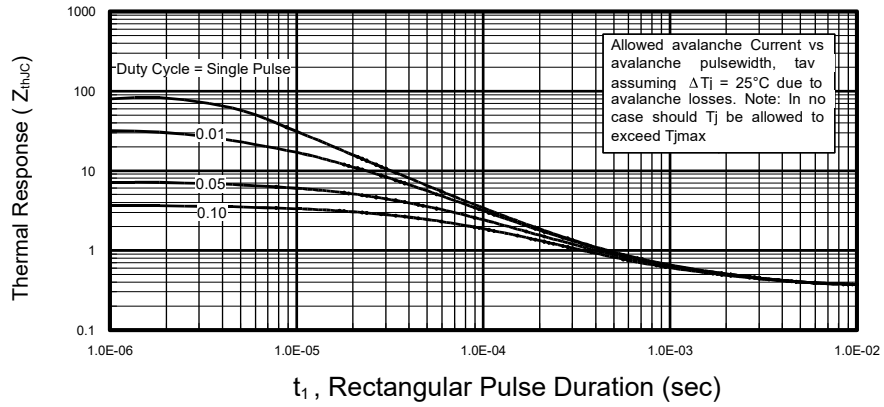


Figure 12: Maximum Effective Transient Thermal Impedance, Junction-to-Case

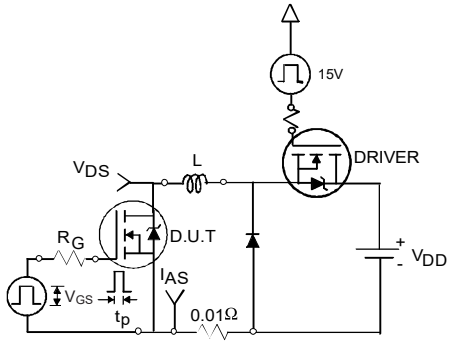


Figure 13: Unclamped Inductive Test Circuit

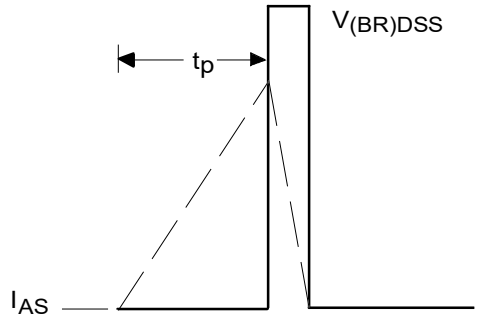


Figure 14: Unclamped Inductive Waveforms

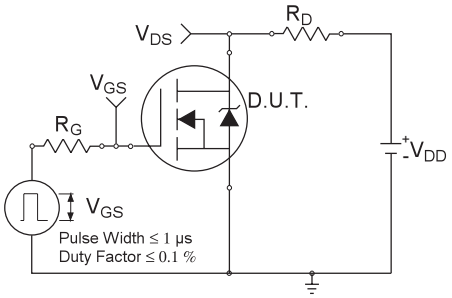


Figure 15: Switching Time Test Circuit

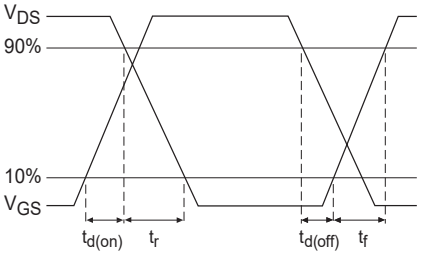
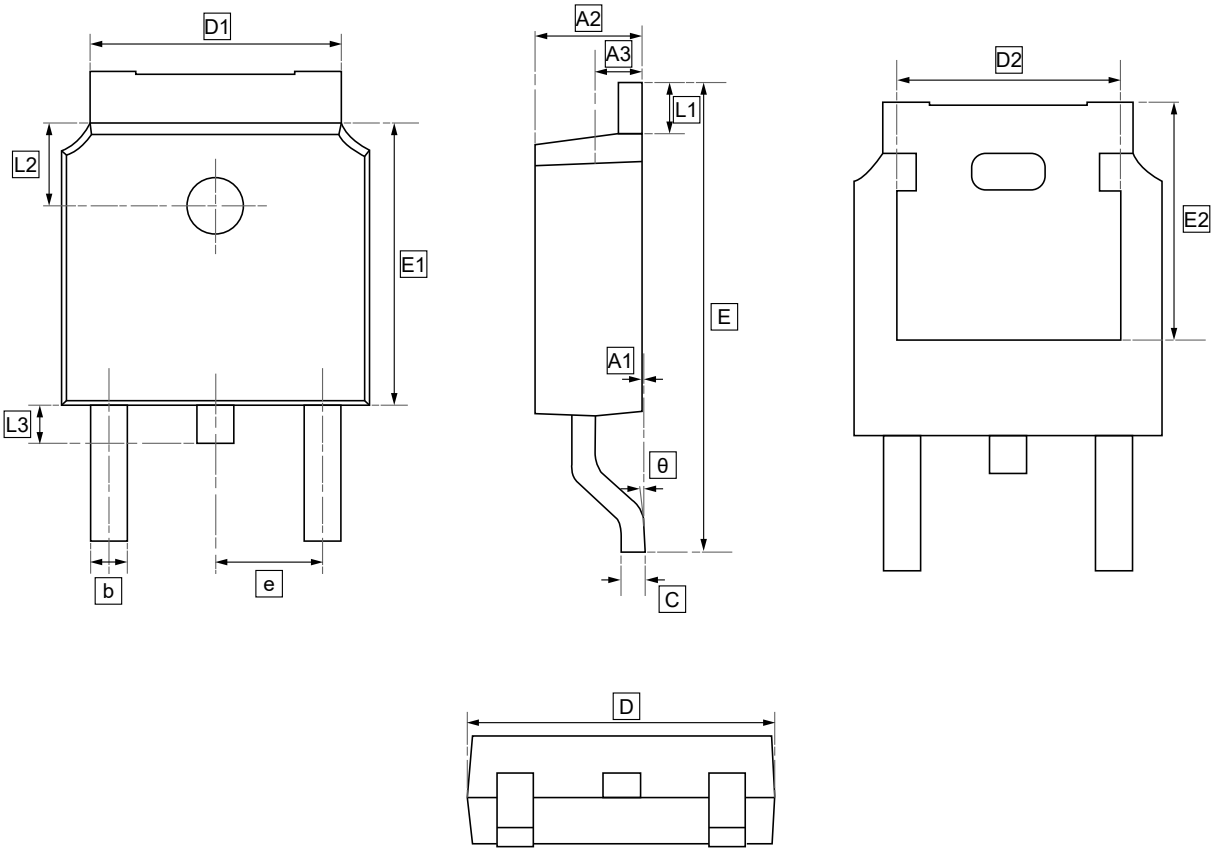


Figure 16: USwitching Time Waveforms

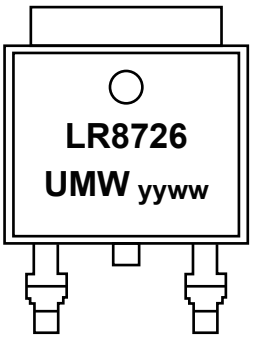
9.TO-252 Package Outline Dimensions



DIMENSIONS (mm are the original dimensions)

Symbol	A1	A2	A3	b	c	D	D1	D2	E	E1	E2	e	L1	L2	L3	θ
Min	0.00	2.18	0.90	0.65	0.46	6.35	4.95	4.32	9.40	5.97	5.21	2.286	0.89	1.70	0.60	0.00
Max	0.13	2.39	1.10	0.85	0.61	6.73	5.46	4.90	10.41	6.22	5.38	BSC	1.27	1.90	1.00	8.00

10.Ordering information



yy: Year Code
ww: Week Code

Order Code	Package	Base QTY	Delivery Mode
UMW IRLR8726TR	TO-252	2500	Tape and reel

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