

1.Description

The UMW IRFR540ZTR uses advanced trench technology and design to provide excellent $R_{DS(ON)}$ with low gate charge. It can be used in a wide variety of applications.

2.2Features

- Special process technology for high E_{SD} capability
- High density cell design for ultra low $R_{DS(ON)}$
- Fully characterized avalanche voltage and current

2.1Features

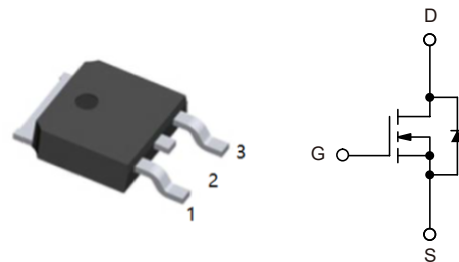
- $V_{DS(V)}=100V$
- $I_D=30A$
- $R_{DS(ON)}<28m\Omega(V_{GS}=10V)$ (Typ:24m Ω)

- Good stability and uniformity with high E_{AS}
- Excellent package for good heat dissipation

3.Pinning information

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

TO-252(DPAK)
top view



4.Absolute Maximum Ratings

Parameter	Symbol	Rating	Units
Drain-Source Voltage	V_{DS}	100	V
Gate-Source Voltage	V_{GS}	± 20	
Drain Current-Continuous	I_D	30	A
Drain Current-Continuous($T_C=100^\circ C$)	$I_D(100^\circ C)$	21	
Pulsed Drain Current	I_{DM}	70	
Maximum Power Dissipation	P_D	75	W
Derating factor		0.5	W/ $^\circ C$
Single pulse avalanche energy (Note 5)	E_{AS}	256	mJ
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 to 175	$^\circ C$
Thermal Resistance, Junction-to-Case (Note 2)	$R_{\theta JC}$	2	$^\circ C/W$



5. Electrical Characteristics

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Off Characteristics						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _D =250μA	100	110		V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =100V, V _{GS} =0V			1	μA
Gate-Body Leakage Current	I _{GSS}	V _{GS} =±20V, V _{DS} =0V			±100	nA
On Characteristics ^(Note 3)						
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	2	3	4	V
Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} =10V, I _D =15A		24	28	mΩ
Forward Transconductance	g _{FS}	V _{GS} =5V, I _D =10A		15		S
Dynamic Characteristics ^(Note4)						
Input Capacitance	C _{iss}	V _{DS} =25V, V _{GS} =0V, f=1MHz		2000		pF
Output Capacitance	C _{oss}			300		pF
Reverse Transfer Capacitance	C _{rss}			250		pF
Switching Characteristics ^(Note4)						
Turn-On DelayTime	t _{D(on)}	V _{DD} =50V, R _L =5Ω V _{GS} =10V, R _{GEN} =3Ω		7		ns
Turn-On Rise Time	t _r			7		ns
Turn-Off DelayTime	t _{D(off)}			29		ns
Turn-Off Fall Time	t _f			7		ns
Total Gate Charge	Q _g	V _{DS} =50V, I _D =18A, V _{GS} =10V		39		nC
Gate to Source Charge	Q _{gs}			8		nC
Gate to Drain Charge	Q _{gd}			12		nC
Drain-Source Diode Characteristics						
Diode Forward Voltage ^(Note 3)	V _{SD}	V _{GS} =0V, I _S =20A			1.2	V
Diode Forward Current ^(Note 2)	I _S				30	A
Reverse Recovery Time	t _{rr}	T _J =25°C, I _F =18A		32		nS
Reverse Recovery Charge	Q _{rr}	dI/dt=100A/μs ^(Note3)		53		nC
Forward Turn-On Time	t _{on}	Intrinsic turn-on time is negligible (turn-on is dominated by L _S +L _D)				

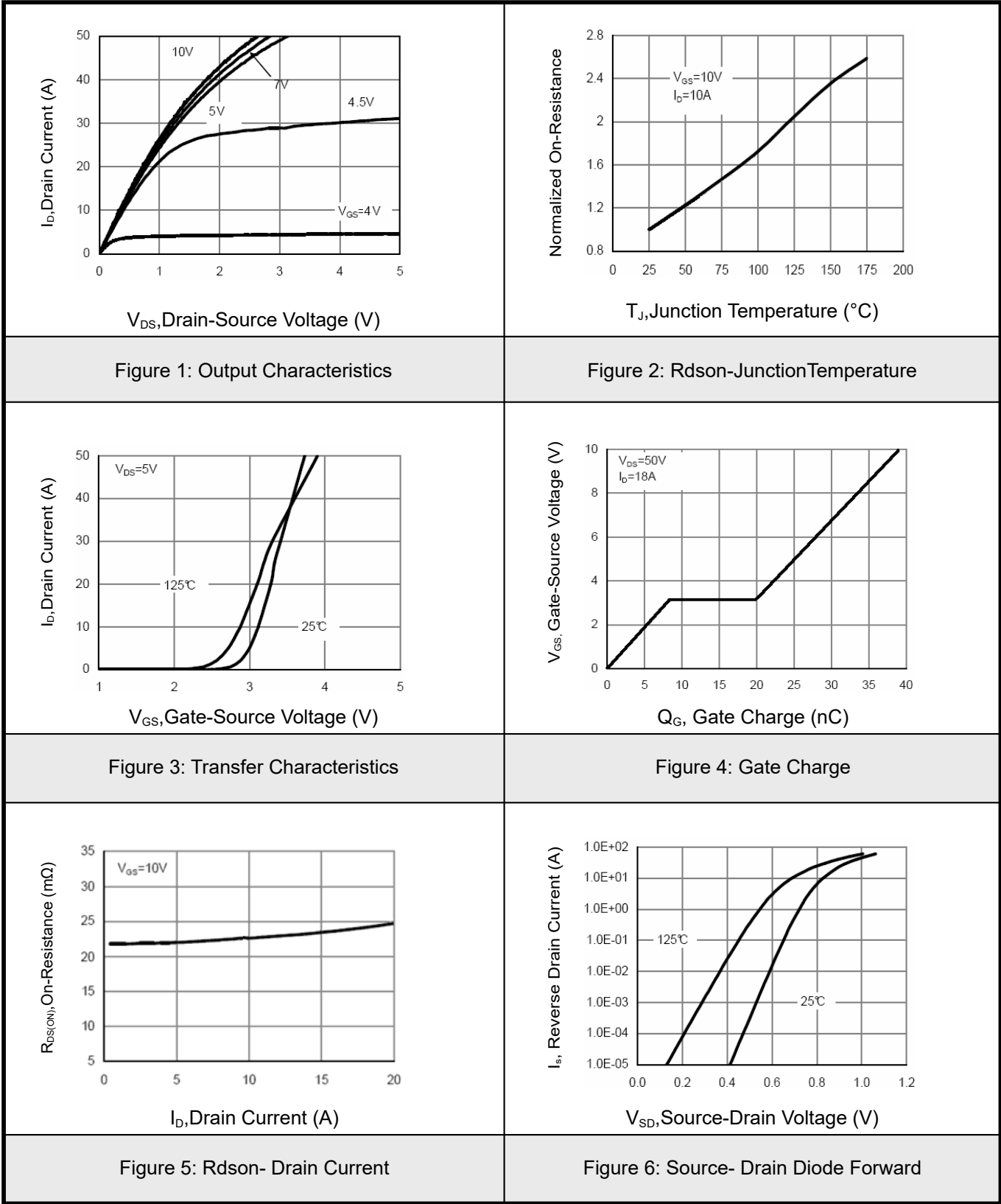


Notes:

1. Repetitive rating; pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, $t \leq 10$ sec.
3. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.
4. Guaranteed by design, not subject to production.
5. E_{AS} Condition : $T_J=25^{\circ}C$, $V_{DD}=50V$, $V_G=10V$, $L=0.5mH$, $R_g=25\Omega$, $I_{AS}=32A$.



6.1Typical Characteristics





6.2 Typical Characteristics

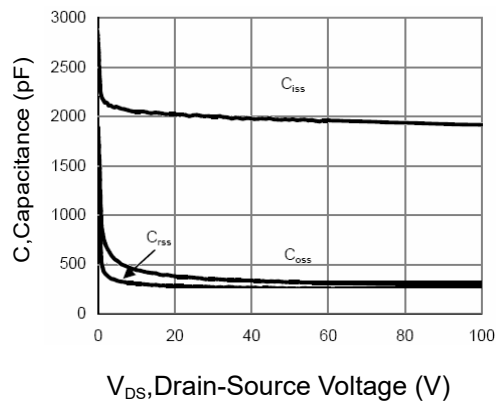


Figure 7: Capacitance vs Vds

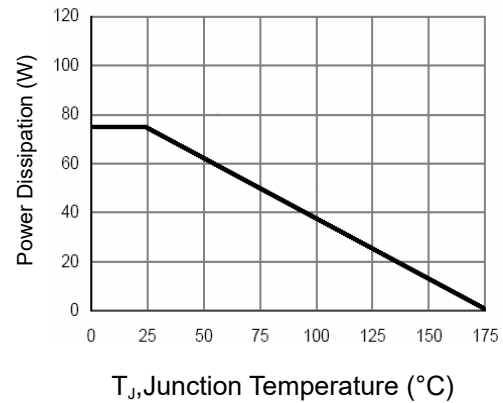


Figure 8: Power De-rating

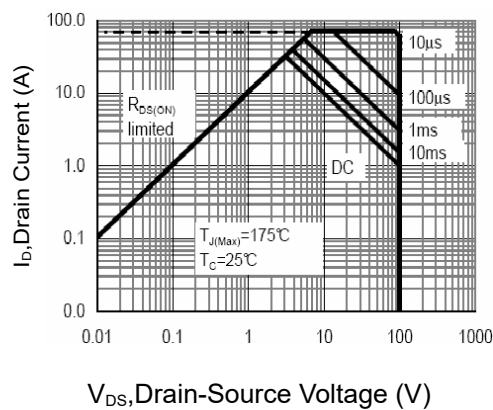


Figure 9: Safe Operation Area

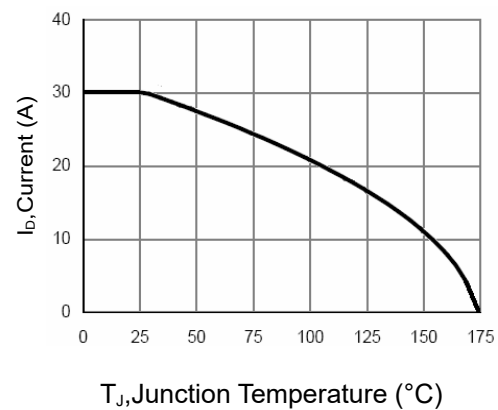


Figure 10: ID Current - Junction Temperature

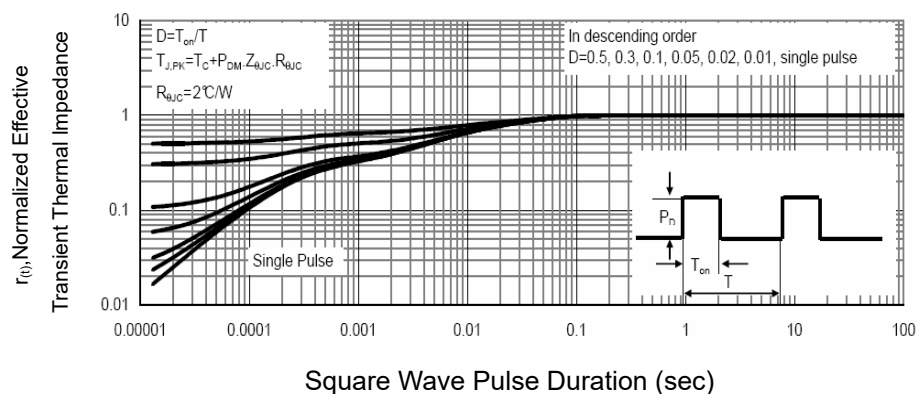
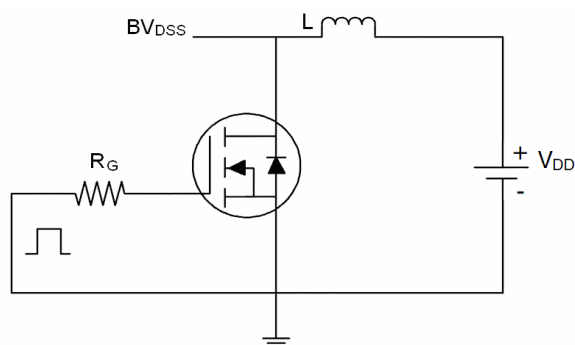


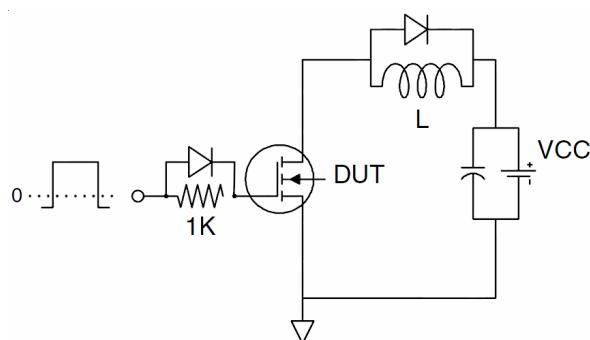
Figure 11: Normalized Maximum Transient Thermal Impedance



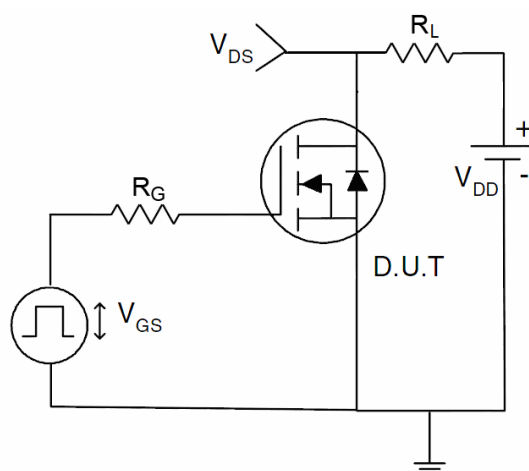
6.3 Typical Characteristics



1) EAS Test Circuit



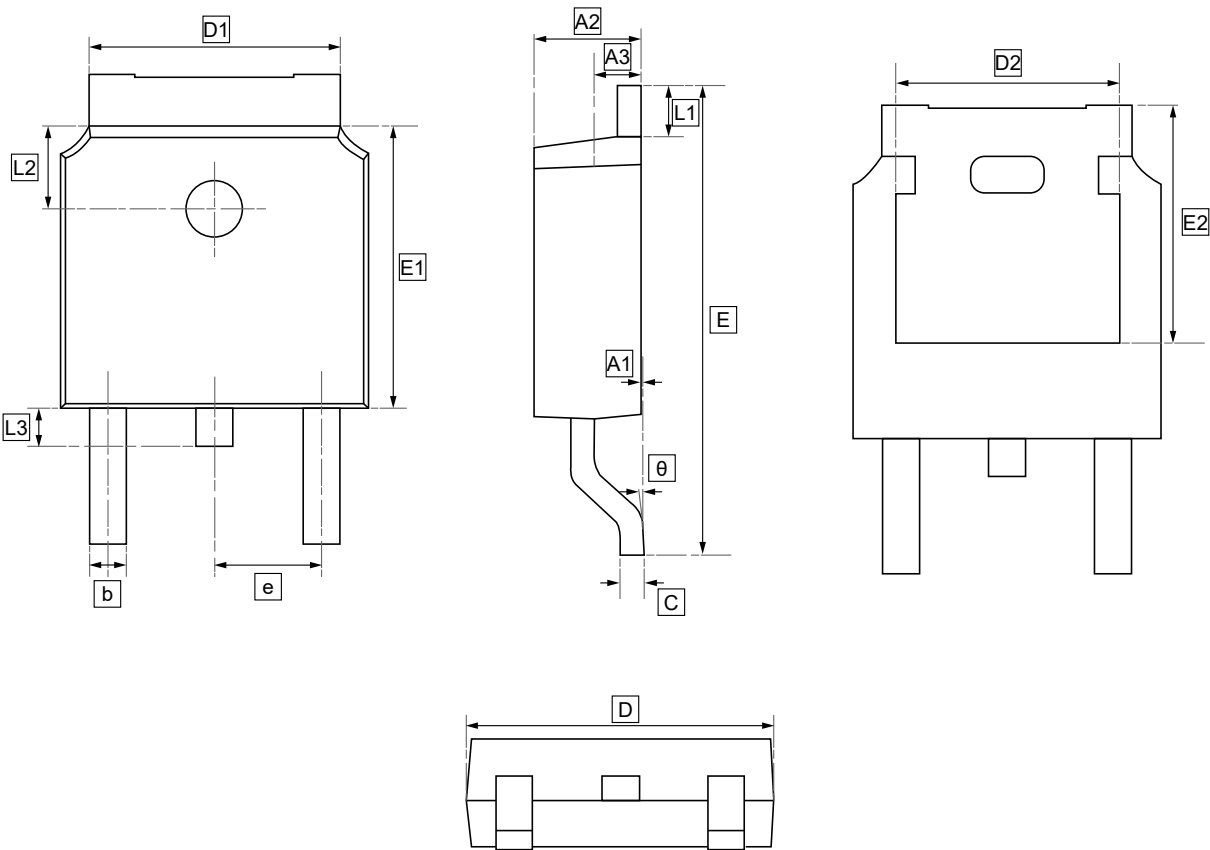
2) Gate Charge Test Circuit



3) Switch Time Test Circuit



7.TO-252 Package Outline Dimensions

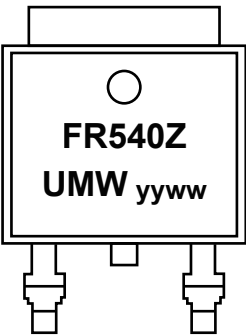


DIMENSIONS (mm are the original dimensions)

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 BSC	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		1.27	1.90	1.00	8.00



8.Ordering information



yy: Year Code
ww: Week Code

Order Code	Package	Base QTY	Delivery Mode
UMW IRFR540ZTR	TO-252	2500	Tape and reel



9.Disclaimer

UMW reserves the right to make changes to all products, specifications. Customers should obtain the latest version of product documentation and verify the completeness and currency of the information before placing an order.

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