

1.Description

The uses advanced trench technology to provide excellent $R_{DS(ON)}$ and low gate charge .This device is suitable for use as a load switch or in PWM applications.

3.Application

- PWM applications
- Load switch

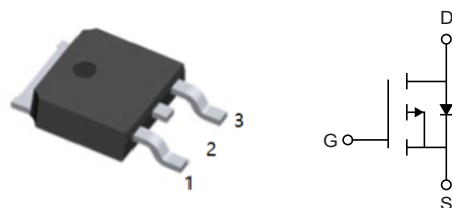
2.Features

- $V_{DS(V)}=-60V$, $I_D=-30A$
- $R_{DS(ON)}<40m\Omega(V_{GS}=-10V)$
- $R_{DS(ON)}<55m\Omega(V_{GS}=-4.5V)$
- High Power and current handing capability
- Lead free product is acquired
- Surface Mount Package

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}	-60	V
Gate-Source Voltage	V_{GS}	± 20	V
Drain Curent-Continuous@ Curent-Pulsed (Note 1)	$I_D(25^{\circ}C)$	-30	A
	$I_D(70^{\circ}C)$	-20	A
	I_{DM}	-60	A
Maximum Power Dissipation	P_D	60	W
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 to 175	$^{\circ}C$
Thermal Resistance,Junction-to-Ambient (Note 2)	$R_{\theta JA}$	25	$^{\circ}C/W$



6. Electrical Characteristics @ $T_J = 25^\circ\text{C}$ (unless otherwise specified)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=-250\mu A$	-60			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=-48V, V_{GS}=0V$			-1	μA
Gate-Body Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$			± 100	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-250\mu A$	-1.1	-2	-3	V
Drain-Source On-State Resistance	$R_{DS(on)}$	$V_{GS}=-10V, I_D=-20A$		31	40	m Ω
		$V_{GS}=-4.5V, I_D=-20A$		42	55	m Ω
Forward Transconductance	g_{FS}	$V_{DS}=-5V, I_D=-20A$	5			S
Input Capacitance	C_{iss}	$V_{DS}=-30V, V_{GS}=0V, F=1MHz$		3060		pF
Output Capacitance	C_{oss}			300		pF
Reverse Transfer Capacitance	C_{rss}			205		pF
Turn-on Delay Time	$t_{D(on)}$	$V_{DS}=-30V, V_{GS}=-10V$ $R_{GEN}=3\Omega, I_D=1A$		14		nS
Turn-on Rise Time	t_r			20		nS
Turn-Off Delay Time	$t_{D(off)}$			40		nS
Turn-Off Fall Time	t_f			19		nS
Total Gate Charge	Q_g	$V_{DS}=-30V, I_D=-20A$ $V_{GS}=-10V$		48		nC
Gate-Source Charge	Q_{gs}			11		nC
Gate-Drain Charge	Q_{gd}			10		nC
Body Diode Reverse Recovery Time	T_{rr}	$I_F=-20A, dI/dt=100A/\mu s$		40		nS
Body Diode Reverse Recovery Charge	Q_{rr}			56		nC
Diode Forward Voltage (Note 3)	V_{SD}	$V_{GS}=0V, I_S=-1A$		-0.72	-1	V

Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on 1in² 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 testing.



7.1Typical Characteristics

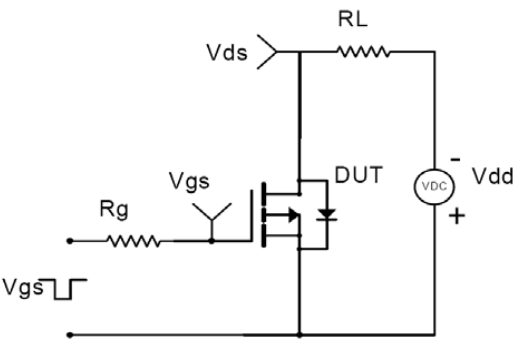
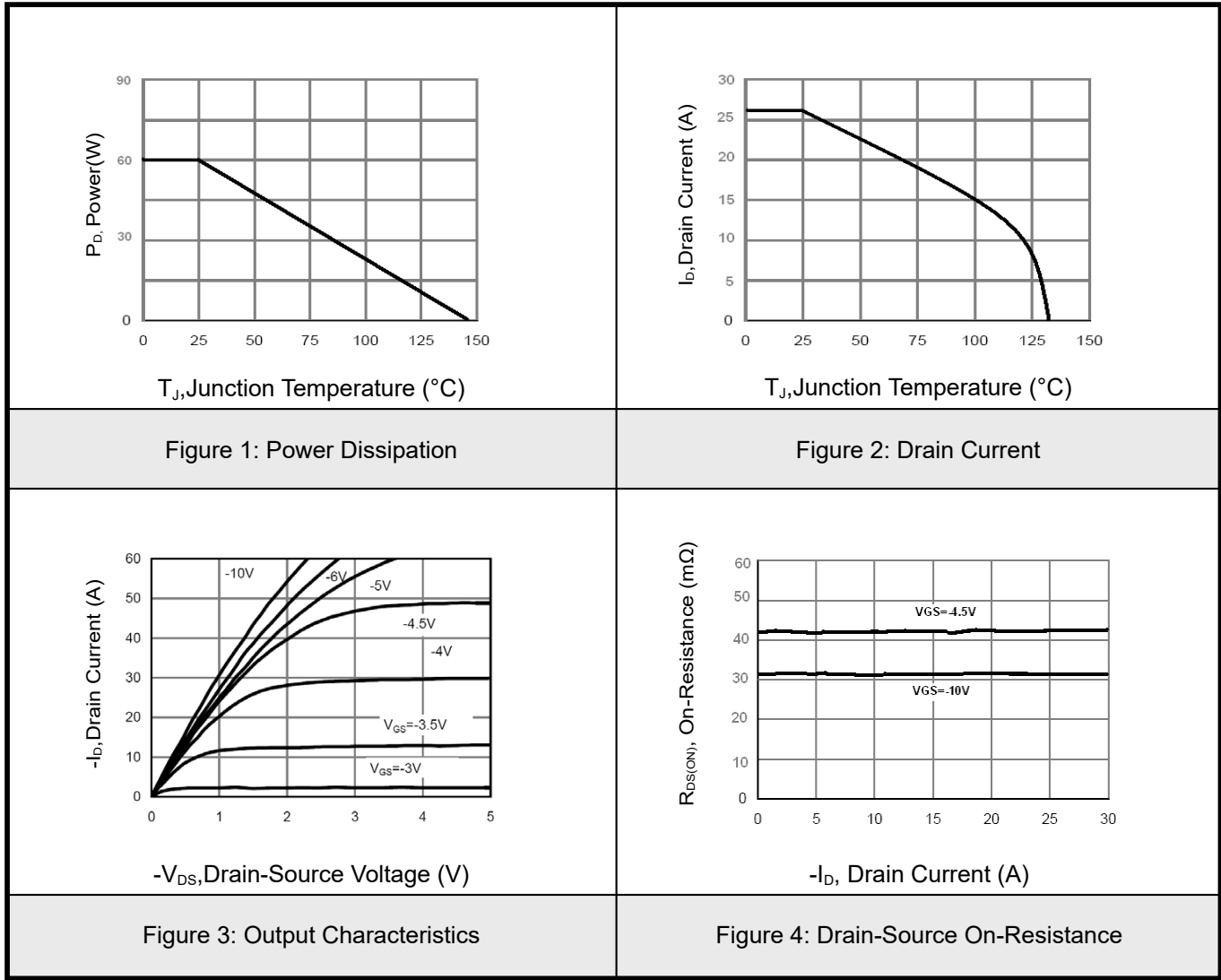


Figure 5: Switching Test Circuit

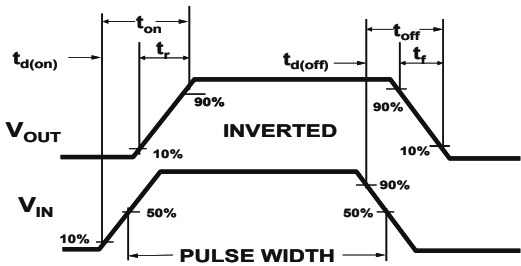


Figure 6: Switching Waveforms



7.2Typical Characteristics

Figure 7: Transfer Characteristics	Figure 8: Drain-Source On-Resistance
Figure 9: Rdson vs Vgs	Figure 10: Capacitance vs Vds
Figure 11: Gate Charge	Figure 12: Source- Drain Diode Forward



7.3 Typical Characteristics

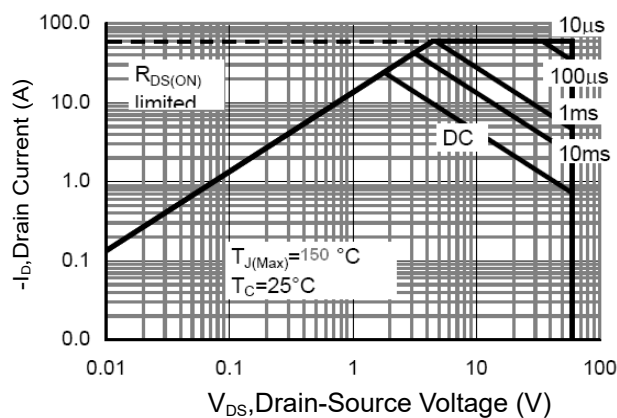


Figure 13: Safe Operation Area

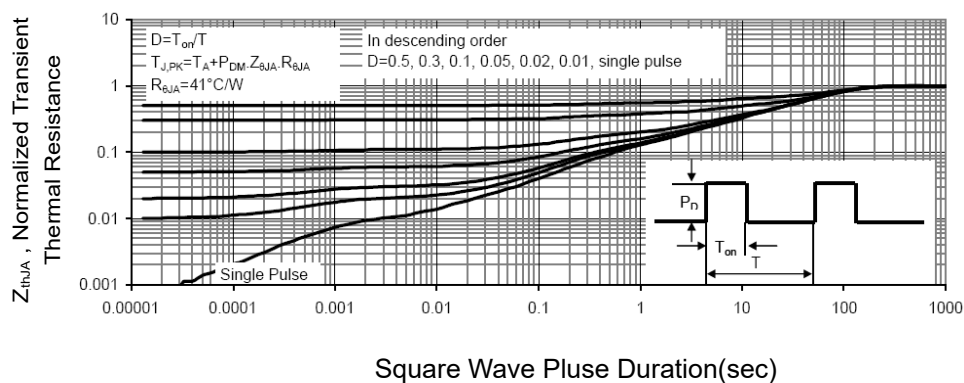
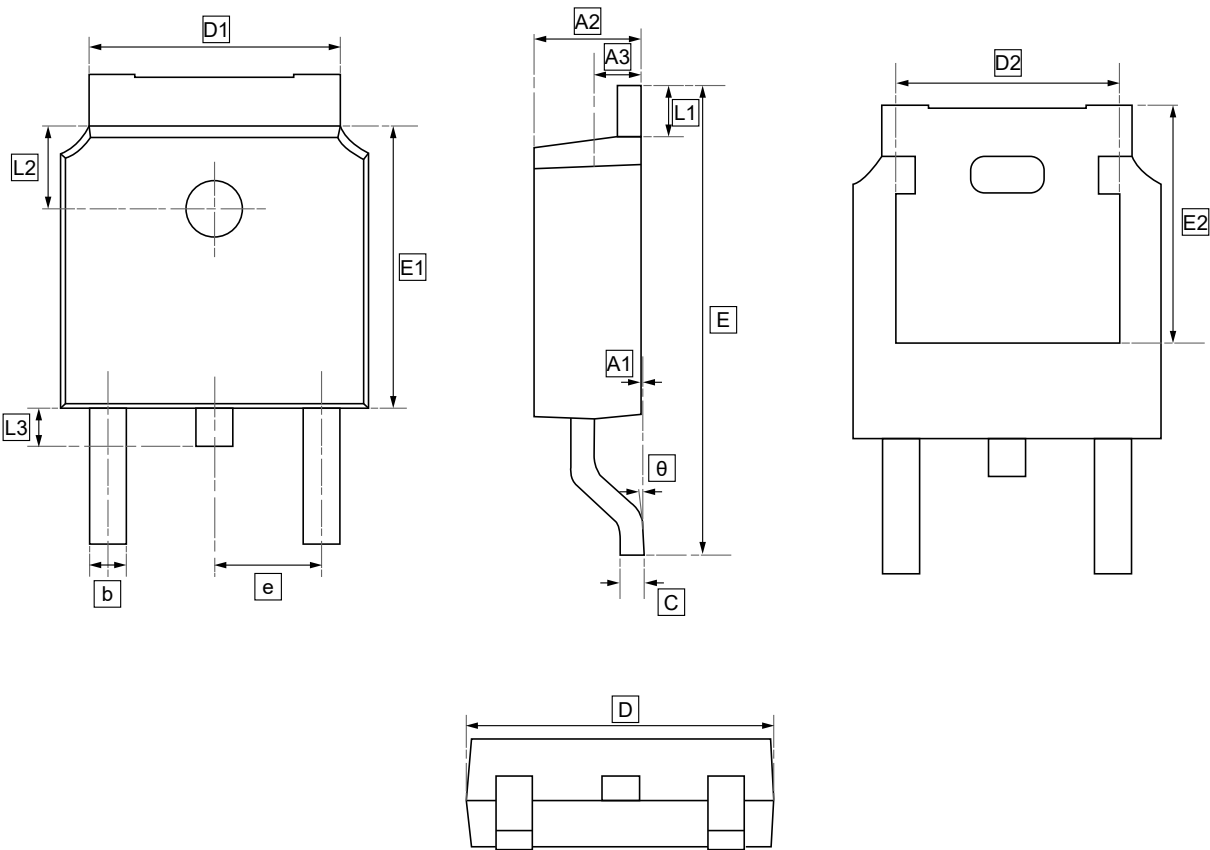


Figure 14: Normalized Maximum Transient Thermal Impedance



8.TO-252 Package Outline Dimensions

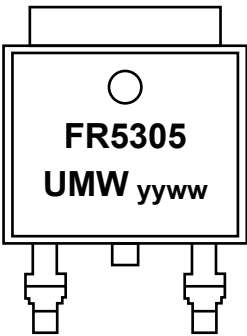


DIMENSIONS (mm are the original dimensions)

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



9.Ordering information



yy: Year Code
ww: Week Code

Order Code	Package	Base QTY	Delivery Mode
UMW IRFR5305TR	TO-252	2500	Tape and reel



10.Disclaimer

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