

Dual N-Channel Enhancement Mode MOSFET

TDM2472

DESCRIPTION

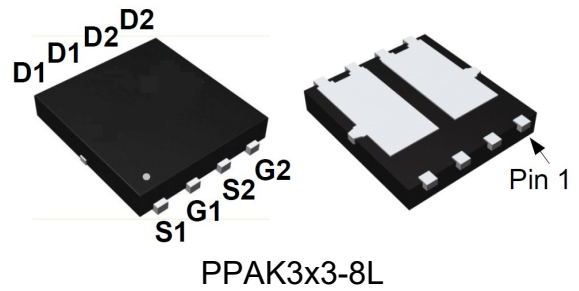
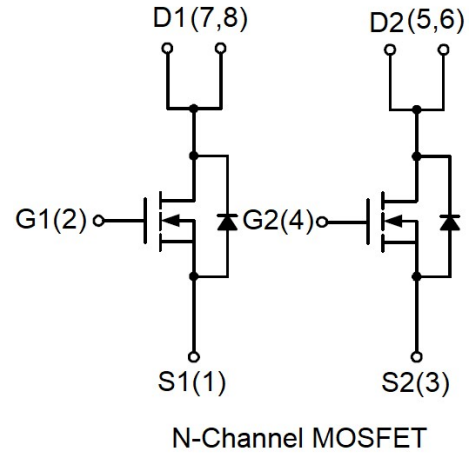
The TDM2472 uses advanced trench technology to provide excellent RDS(ON) and low gate charge. This device is suitable for use as a load switch or in PWM applications.

GENERAL FEATURES

- Channel 1& Channel 2  
RDS(ON) < 13mΩ @ VGS=10V
- RDS(ON) < 20mΩ @ VGS=4.5V
- High Power and current handling capability
- Lead free product is available
- Surface Mount Package

Application

- PWM applications
- Load switch
- Power management



ABSOLUTE MAXIMUM RATINGS(Tc=25°C unless otherwise noted)

Parameter	Symbol	Channel 1	Channel 2	Unit
Drain-Source Voltage	V <sub>DS</sub>	40	40	V
Gate-Source Voltage	V <sub>GS</sub>	±20	±20	V
Continuous Drain Current <sup>(note1)</sup>	I <sub>D</sub> (T <sub>C</sub> =25°C)	40	40	A
	I <sub>D</sub> (T <sub>C</sub> =100°C)	25	25	A
Pulse Drain Current Tested	I <sub>DM</sub> (T <sub>C</sub> =25°C)	160	160	A
Maximum Power Dissipation	P <sub>D</sub> (T <sub>C</sub> =25°C)	93	93	W
Thermal Resistance-Junction to Ambient <sup>(note 4)</sup>	R <sub>θJA</sub> (t≤10s)	50	50	°C/W
	R <sub>θJA</sub> (Steady State)	88	88	
Thermal Resistance-Junction to Case	R <sub>θJC</sub> (Steady State)	6	6	°C/W
Operating Junction Temperature Range	T <sub>J</sub>	-55 To 150		°C
Storage Temperature Range	T <sub>STG</sub>	-55 To 150		°C

**ELECTRICAL CHARACTERISTICS** ( $T_c=25^\circ\text{C}$  unless otherwise noted)

Parameter	Symbol	Condition	Channel1& Channel2			Unit
			Min	Typ	Max	
<b>OFF CHARACTERISTICS</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS}=0V, I_D=250\mu A$	40	-	-	V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=40V, V_{GS}=0V$	-	-	1	$\mu A$
Gate-Body Leakage Current	$I_{GSS}$	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	$\pm 100$	nA
<b>ON CHARACTERISTICS</b> (Note 2)						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1.0	1.5	2.2	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=20A$	-	9.6	13	m $\Omega$
		$V_{GS}=4.5V, I_D=10A$	-	13.7	20	m $\Omega$
<b>DYNAMIC CHARACTERISTICS</b> (Note3)						
Gate Resistance	$R_G$	$V_{GS}=0V, V_{DS}=0V, F=1MHz$	-	4.4	-	$\Omega$
Input Capacitance	$C_{iss}$	$V_{DS}=20V, V_{GS}=0V, F=1.0MHz$	-	1050	-	PF
Output Capacitance	$C_{oss}$		-	91	-	PF
Reverse Transfer Capacitance	$C_{rss}$		-	81	-	PF
<b>SWITCHING CHARACTERISTICS</b> (Note 3)						
Turn-on Delay Time	$t_{d(on)}$	$V_{DS}=30V, R_L=0.3\Omega, V_{GS}=10V, I_D=40A, R_G=4.7\Omega$	-	6	-	nS
Turn-on Rise Time	$t_r$		-	11	-	nS
Turn-Off Delay Time	$t_{d(off)}$		-	35	-	nS
Turn-Off Fall Time	$t_f$		-	10	-	nS
Total Gate Charge	$Q_g$	$V_{DS}=20V, I_D=40A, V_{GS}=10V$	-	23.7	-	nC
Gate-Source Charge	$Q_{gs}$		-	3.6	-	nC
Gate-Drain Charge	$Q_{gd}$		-	6.7	-	nC
<b>DRAIN-SOURCE DIODE CHARACTERISTICS</b>						
Diode Forward Voltage (Note 2)	$V_{SD}$	$V_{GS}=0V, I_S=20A$	-	0.8	1.2	V
Maximum Continuous Drain-Source Diode Forward Current	$I_S$		-	-	40	A
Maximum Pulsed Drain-Source Diode Forward Current	$I_{SM}$		-	-	160	A

**NOTES:**

1. Max continuous current is limited by bonding wire.
2. Pulse Test: Pulse Width  $\leq 300\mu s$ , Duty Cycle  $\leq 2\%$ .
3. Guaranteed by design, not subject to production testing.
4.  $R_{\theta JA}$  steady state  $t=999s$

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Channel 1&2 Typical Operating Characteristics

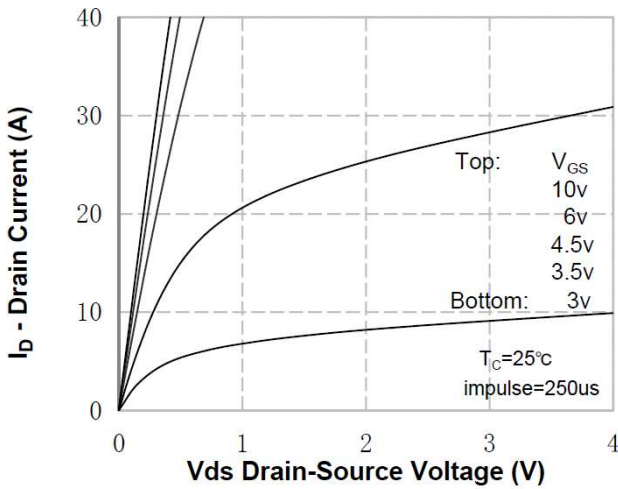


Figure 1. On-Region Characteristics

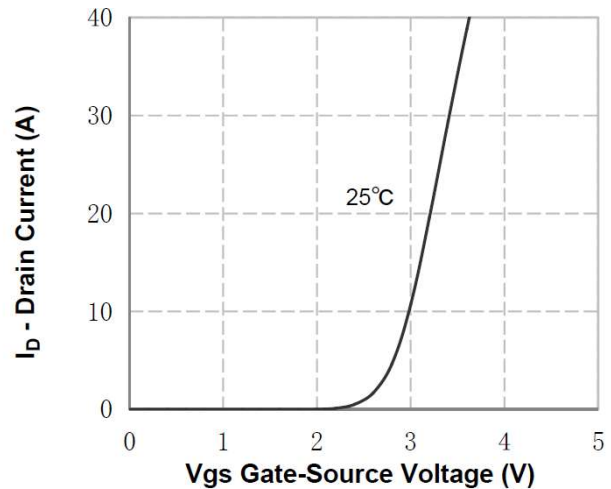


Figure 2. Transfer Characteristics

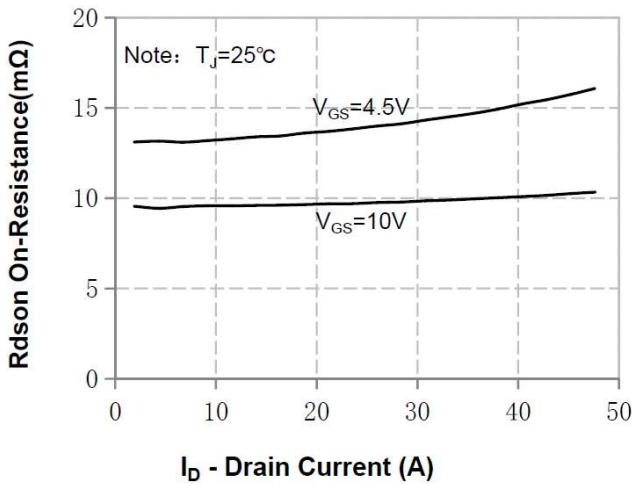


Figure 3. On-Resistance Variation vs Drain Current and Gate Voltage

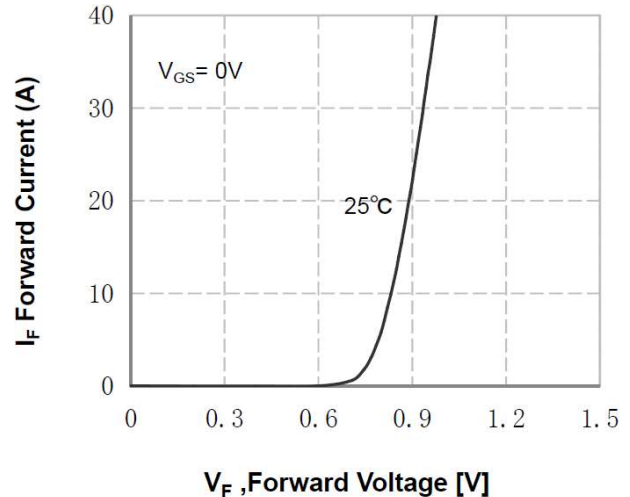


Figure 4. Body Diode Forward Voltage Variation with Source Current and Temperature

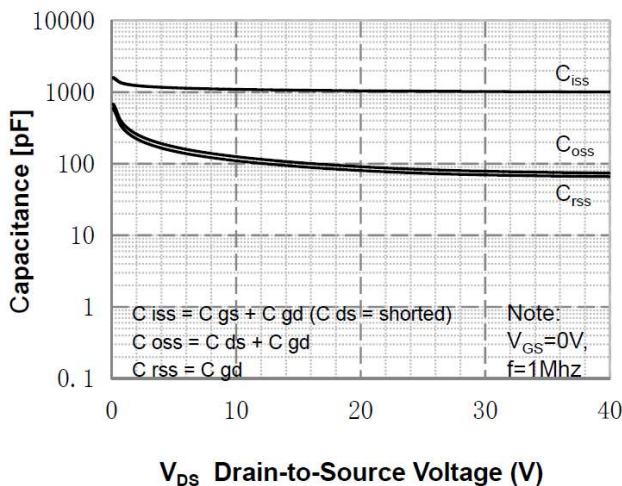


Figure 5. Capacitance Characteristics

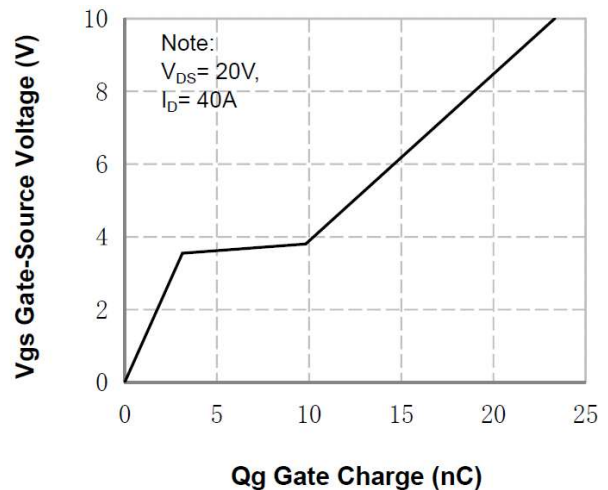


Figure 6. Gate Charge Characteristics

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Channel 1&2 Typical Operating Characteristics(Cont.)

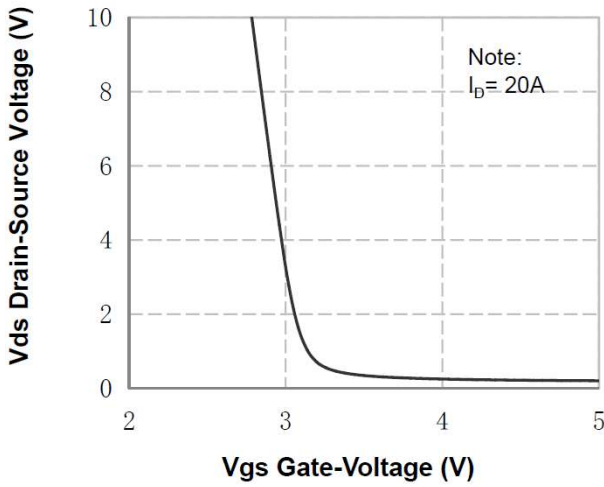


Figure 7. Vds Drain-Source Voltage vs Gate Voltage

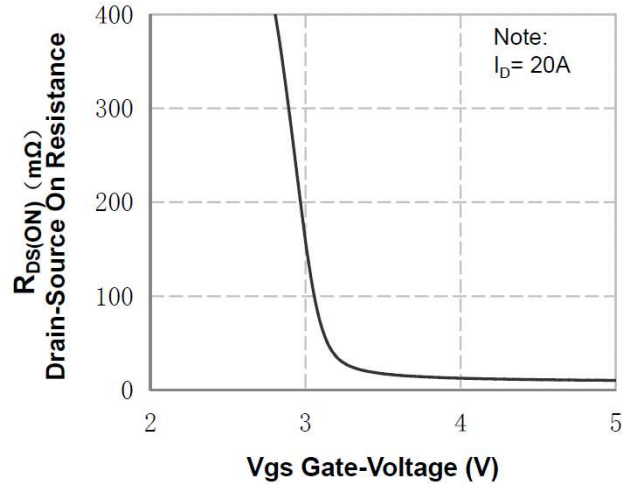


Figure 8. On-Resistance vs Gate Voltage

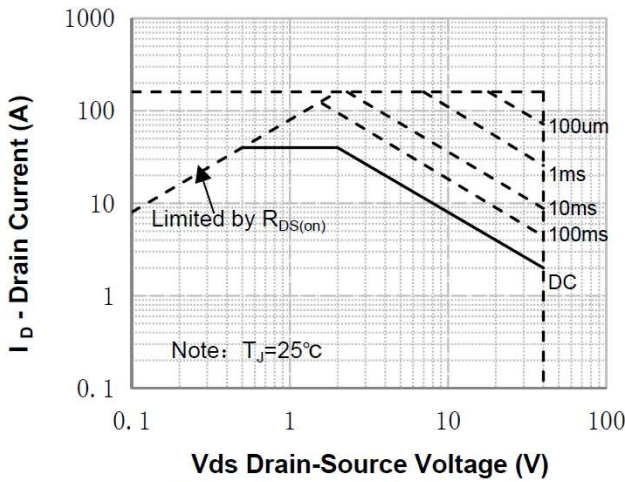


Figure 9. Maximum Safe Operating Area

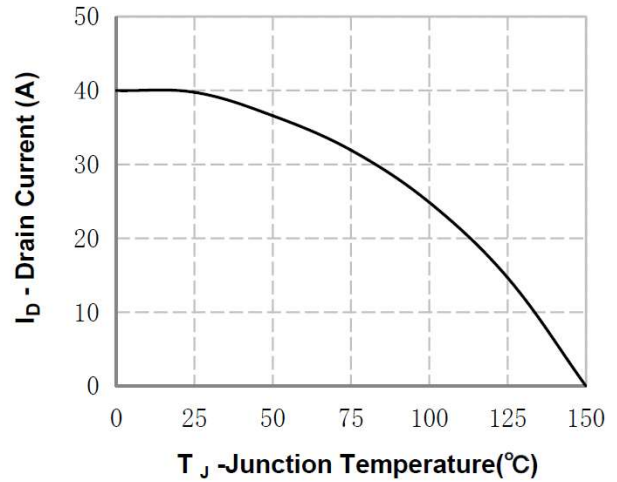


Figure 10. Maximum Continuous Drain Current vs Temperature

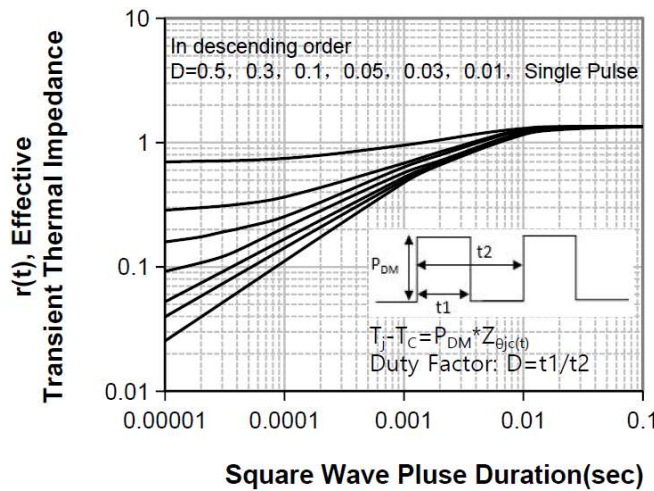
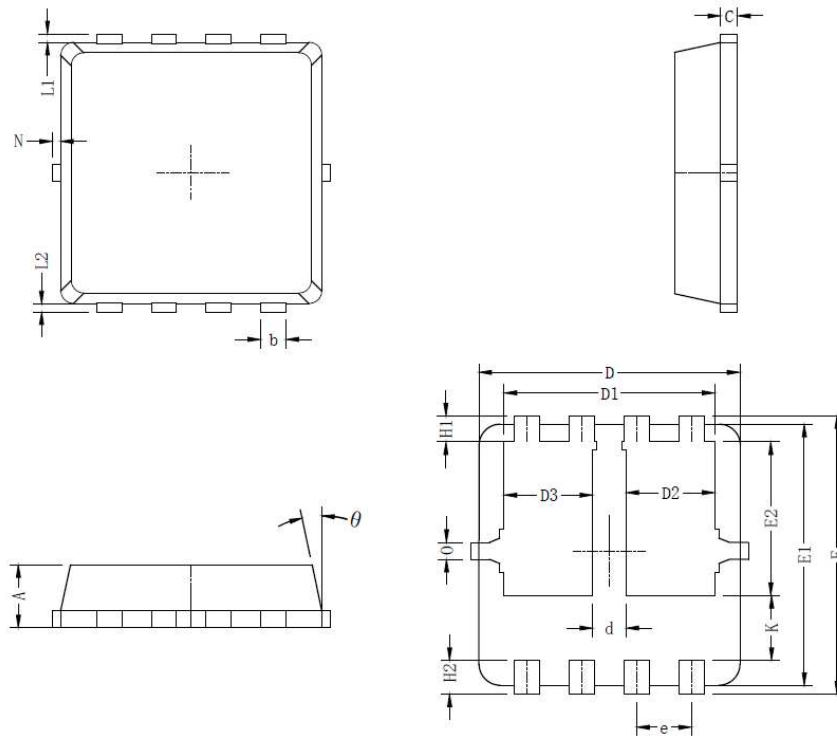


Figure 11. Transient Thermal Response Curve

Package Information

PPAK3x3-8L Package



Symbol	Millimeters	
	Min	Nom
A	0.65	0.85
b	0.25	0.35
C	0.10	0.25
D	3.00	3.30
D1	2.40	2.60
D2/D3	1.00	1.10
d	0.30	0.50
E	3.10	3.40
E1	3.00	3.20
E2	1.7	1.95
e	0.65BSC	
H1	0.20	0.42
H2	0.30	0.50
K	0.66	0.88
L1/L2	0.10REF	
θ	-	13°
N	0	0.15
0	0.2REF	

Design Notes

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