

Dual N-Channel Enhancement Mode MOSFET

TDM2472

DESCRIPTION

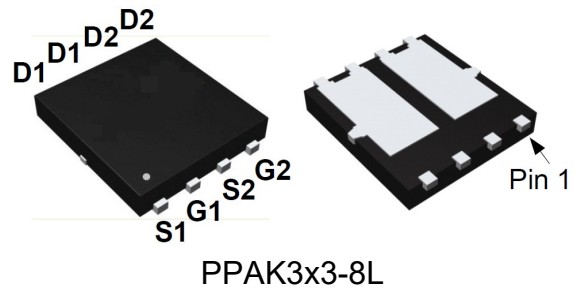
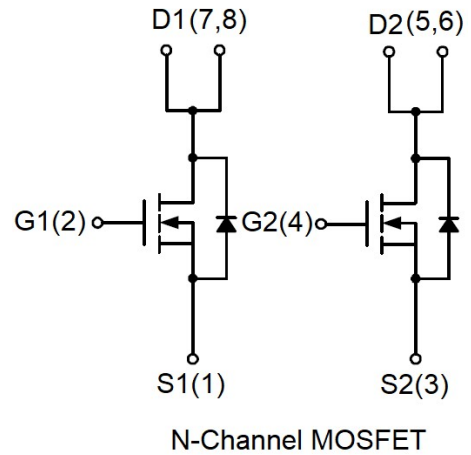
The TDM2472 uses advanced trench technology to provide excellent $R_{DS(ON)}$ and low gate charge. This device is suitable for use as a load switch or in PWM applications.

GENERAL FEATURES

- Channel 1 & Channel 2
- $R_{DS(ON)} < 13m\Omega$ @ $V_{GS}=10V$
- $R_{DS(ON)} < 20m\Omega$ @ $V_{GS}=4.5V$
- High Power and current handling capability
- Lead free product is available
- Surface Mount Package

Application

- PWM applications
- Load switch
- Power management

ABSOLUTE MAXIMUM RATINGS($T_c=25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Channel 1	Channel 2	Unit
Drain-Source Voltage	V_{DS}	40	40	V
Gate-Source Voltage	V_{GS}	± 20	± 20	V
Continuous Drain Current ^(note1)	$I_D(T_c=25^\circ\text{C})$	40	40	A
	$I_D(T_c=100^\circ\text{C})$	25	25	A
Pulse Drain Current Tested	$I_{DM}(T_c=25^\circ\text{C})$	160	160	A
Maximum Power Dissipation	$P_D(T_c=25^\circ\text{C})$	93	93	W
Thermal Resistance-Junction to Ambient ^(note 4)	$R_{\theta JA}(t \leq 10s)$	50	50	$^\circ\text{C}/\text{W}$
	$R_{\theta JA}(\text{Steady State})$	88	88	
Thermal Resistance-Junction to Case	$R_{\theta JC}(\text{Steady State})$	6	6	$^\circ\text{C}/\text{W}$
Operating Junction Temperature Range	T_J	-55 To 150		$^\circ\text{C}$
Storage Temperature Range	T_{STG}	-55 To 150		$^\circ\text{C}$

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ELECTRICAL CHARACTERISTICS (T_c=25°C unless otherwise noted)

Parameter	Symbol	Condition	Channel1& Channel2			Unit
			Min	Typ	Max	
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _D =250μA	40	-	-	V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =40V, V _{GS} =0V	-	-	1	μ A
Gate-Body Leakage Current	I _{GSS}	V _{GS} =±20V, V _{DS} =0V	-	-	± 100	nA
ON CHARACTERISTICS (Note 2)						
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	1.0	1.5	2.2	V
Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} =10V, I _D =20A	-	9.6	13	mΩ
		V _{GS} =4.5V, I _D =10A	-	13.7	20	mΩ
DYNAMIC CHARACTERISTICS (Note3)						
Gate Resistance	R _G	V _{GS} =0V, V _{DS} =0V,F=1MHz	-	4.4	-	Ω
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
SWITCHING CHARACTERISTICS (Note 3)						
Turn-on Delay Time	t _{d(on)}	V _{DS} =30V, R _L =0.3 Ω, V _{GS} =10V, I _D =40A, R _G =4.7Ω	-	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
DRAIN-SOURCE DIODE CHARACTERISTICS						
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 ≤ 300μs, Duty Cycle ≤ 2%.
3. Guaranteed by design, not subject to production testing.
4. R_{θJA} steady state t=999s

Channel 1&2 Typical Operating Characteristics

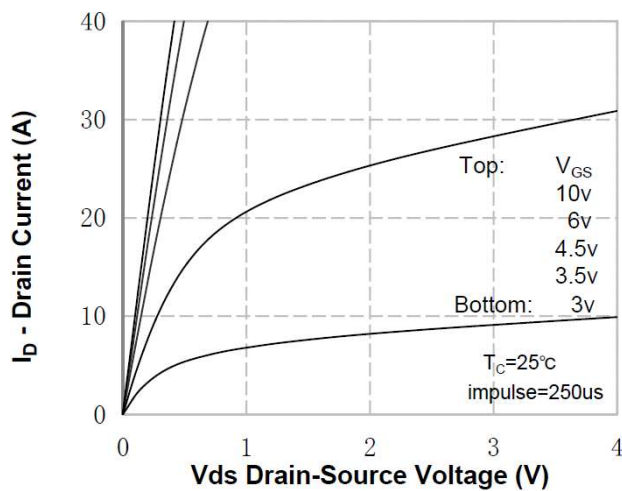


Figure 1. On-Region Characteristics

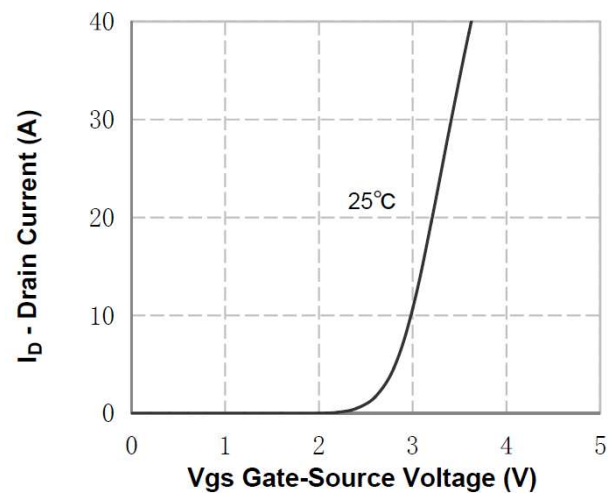


Figure 2. Transfer Characteristics

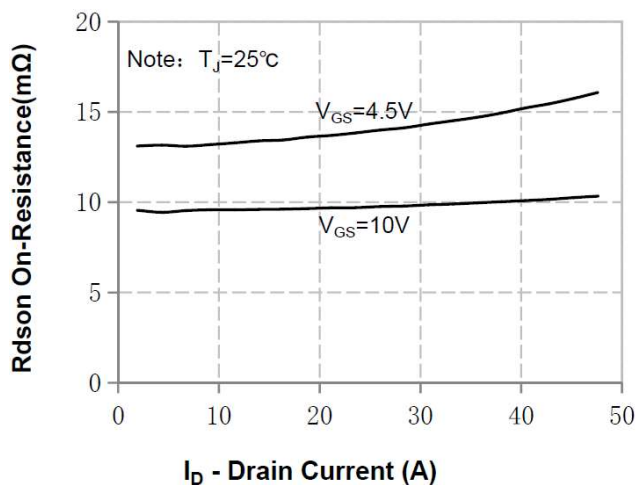


Figure 3. On-Resistance Variation vs Drain Current and Gate Voltage

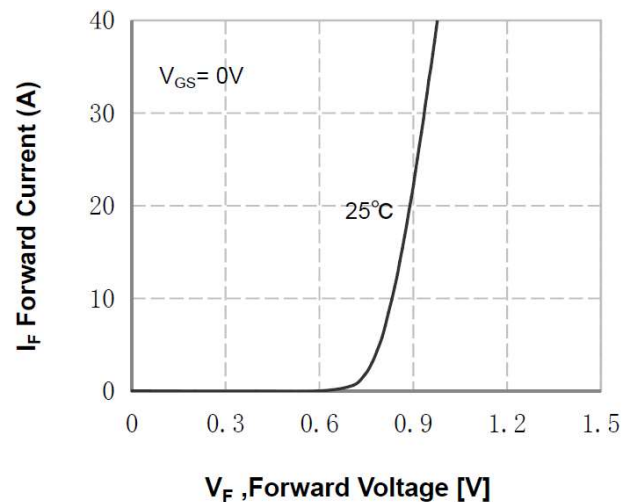


Figure 4. Body Diode Forward Voltage Variation with Source Current and Temperature

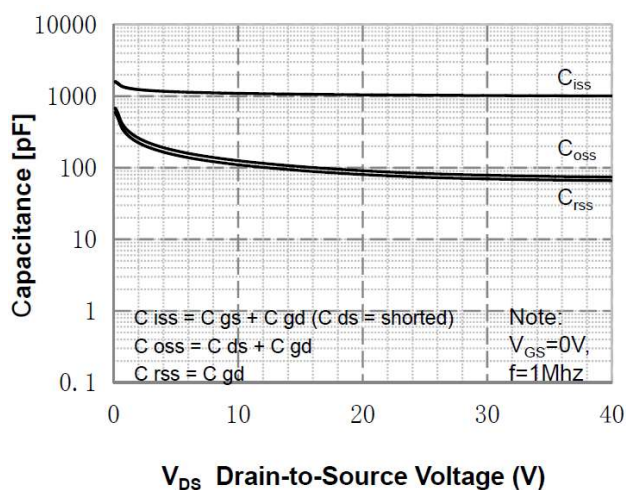


Figure 5. Capacitance Characteristics

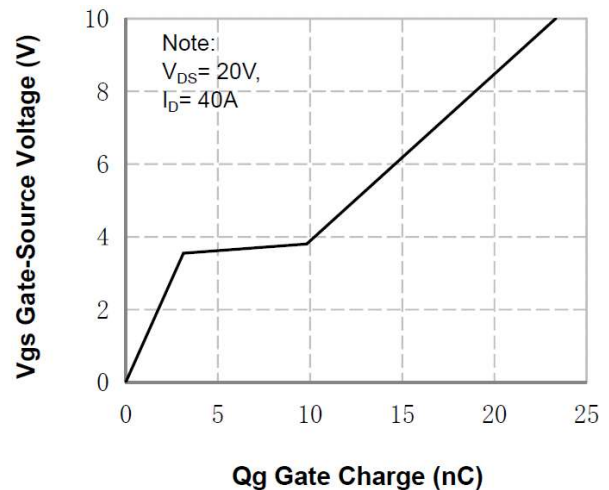


Figure 6. Gate Charge Characteristics

Channel 1&2 Typical Operating Characteristics(Cont.)

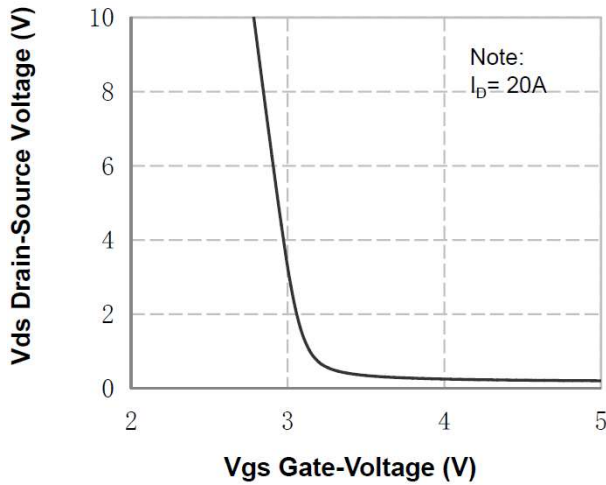


Figure 7. Vds Drain-Source Voltage vs Gate Voltage

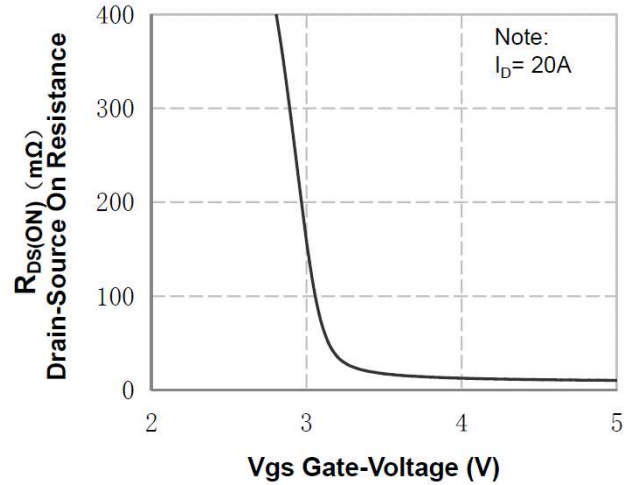


Figure 8. On-Resistance vs Gate Voltage

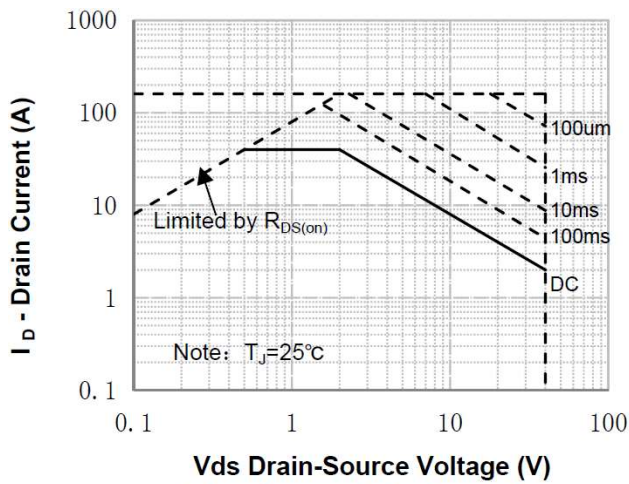


Figure 9. Maximum Safe Operating Area

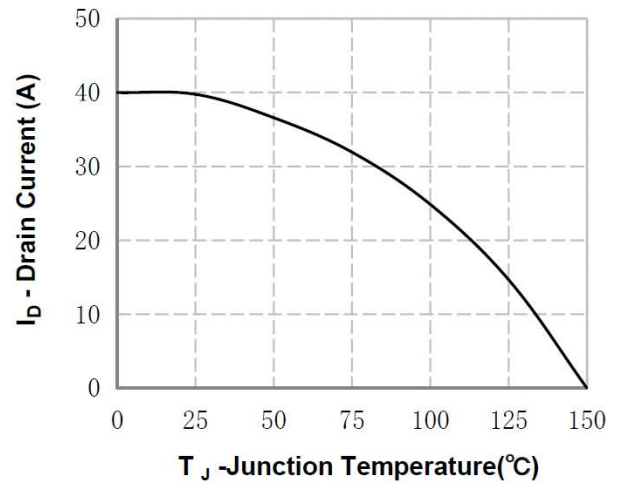


Figure 10. Maximum Continuous Drain Current vs Temperature

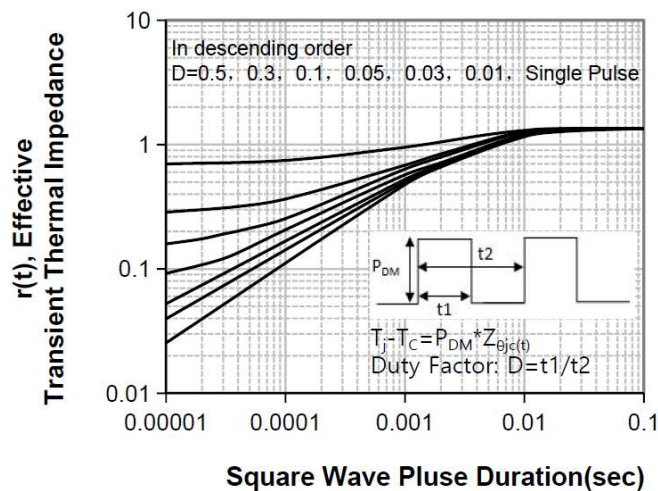
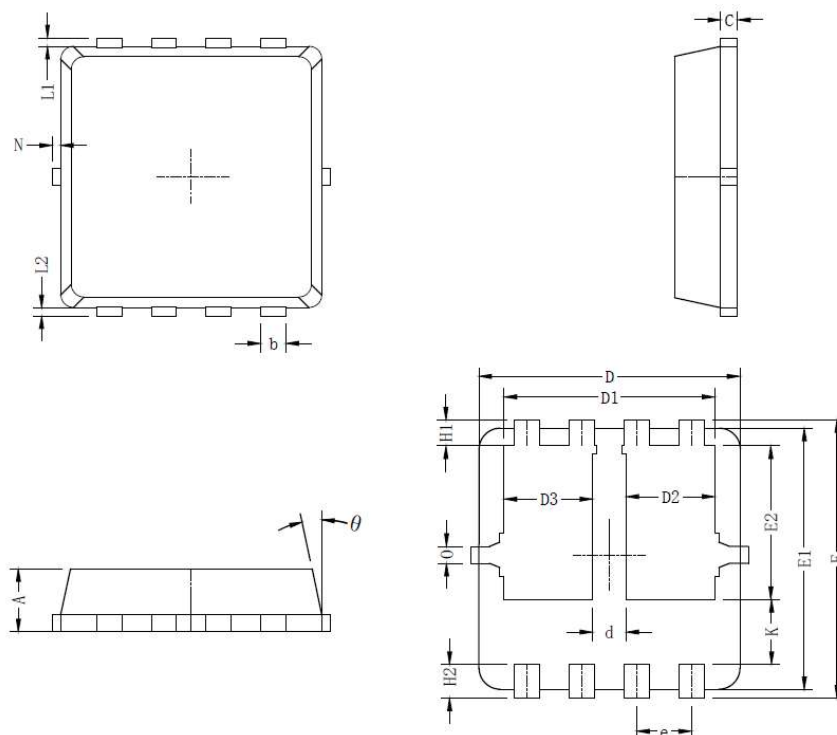


Figure 11. Transient Thermal Response Curve

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