N-Channel Enhancement Mode MOSFET

DESCRIPTION

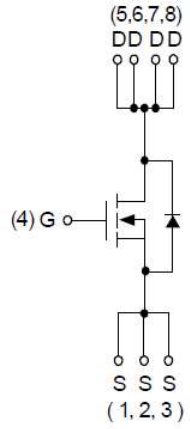
The TDM2332 uses advanced trench technology to provide excellent RDS(ON) and low gate charge. This device is suitable for use as a load switch or in PWM applications.

GENERAL FEATURES

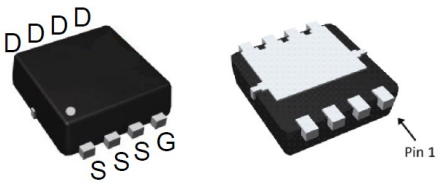
- RDS(ON) < 24mΩ @ VGS=10V
  RDS(ON) < 38mΩ @ VGS=4.5V
- High Power and current handling capability
- Surface Mount Package
- Lead Free and Green Devices available(RoHS Compliant)

Application

- PWM applications
- Load switch
- Power management
- Powered Systems



N-Channel MOSFET



PPAK-3*3-8

ABSOLUTE MAXIMUM RATINGS(T_C=25℃unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	±20	V
Drain Current @ Continuous	I_D（T_C=25℃）	5.6	A
	I_D（T_C=70℃）	4.5	A
Drain Current @ Current-Pulsed (Note 1)	I_{DM}	23	A
Maximum Power Dissipation	P_D(T_C=25℃)	1.39	W
Thermal Resistance,Junction-to-Ambient (Note 2)	$R_{\theta JA}$ (t≤10s)	40	℃/W
	$R_{\theta JA}$ (Steady State)	60	
Operating Junction Temperature Range	T_J	-55 To 150	℃
Storage Temperature Range	T_{STG}	-55 To 150	℃

N-Channel Enhancement Mode MOSFET

ELECTRICAL CHARACTERISTICS (T_A=25℃unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V I_D=250μA	30	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=30V, V_{GS}=0V	-	-	1	μA
Gate-Body Leakage Current	I_{GSS}	V_{GS}=±20V, V_{DS}=0V	-	-	±100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=VGS, I_D=250μA	1	1.5	2.2	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=5.6A	-	17.5	24	mΩ
		V_{GS}=4.5V, I_D=5A	-	24	38	
DYNAMIC CHARACTERISTICS (Note3)						
Input Capacitance	C_{iss}	V_{DS}=15V, V_{GS}=0V, F=1.0MHz	-	545	-	PF
Output Capacitance	C_{oss}		-	60	-	PF
Reverse Transfer Capacitance	C_{rss}		-	48	-	PF
SWITCHING CHARACTERISTICS (Note 3)						
Turn-on Delay Time	$t_{d(on)}$	V_{DS}=15V, R_L=2.8Ω, V_{GS}=10V, R_G=3Ω	-	2.8	-	nS
Turn-on Rise Time	t_r		-	7.2	-	nS
Turn-Off Delay Time	$t_{d(off)}$		-	15.8	-	nS
Turn-Off Fall Time	t_f		-	10	-	nS
Total Gate Charge	Q_g	V_{DS}=15V, I_D=5.6A, V_{GS}=10V	-	5.2	-	nC
Gate-Source Charge	Q_{gs}		-	0.85	-	nC
Gate-Drain Charge	Q_{gd}		-	2.55	-	nC
DRAIN-SOURCE DIODE CHARACTERISTICS						
Maximum Continuous Drain-Source Diode Forward Current	I_S		-	-	5.6	A
Maximum Pulsed Drain-Source Diode Forward Current	I_{SM}		-	-	23	A
Diode Forward Voltage (Note 2)	V_{SD}	V_{GS}=0V, I_S=5.6A	-	-	1.2	V

NOTES:

1. Pulse width limited by max. junction temperature.
2. $R_{\theta JA}$ steady state=999s. $R_{\theta JA}$ is measured with the device mounted on 1in2, Fr-4 board with 2oz.Copper
3. Guaranteed by design, not subject to production testing

Typical Operating Characteristics

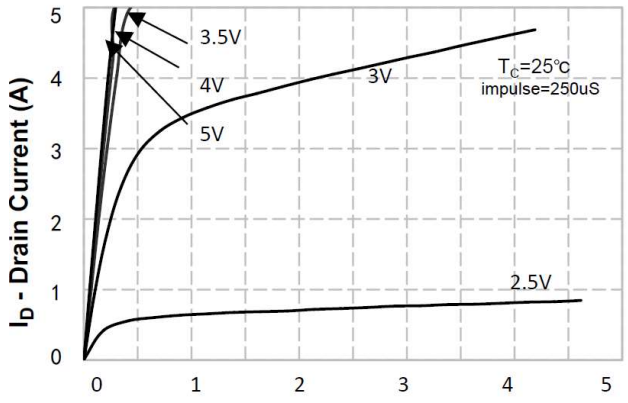


Figure 1. On-Region Characteristics

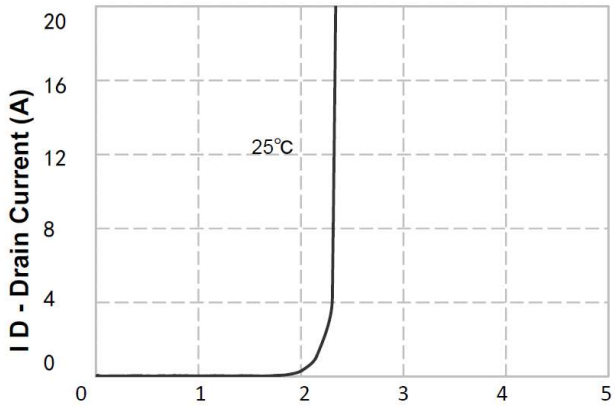


Figure 2. Transfer Characteristics

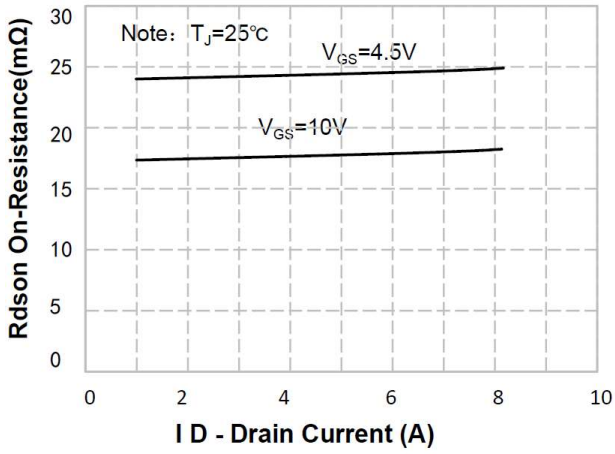


Figure 3. On-Resistance Variation vs Drain Current and Gate Voltage

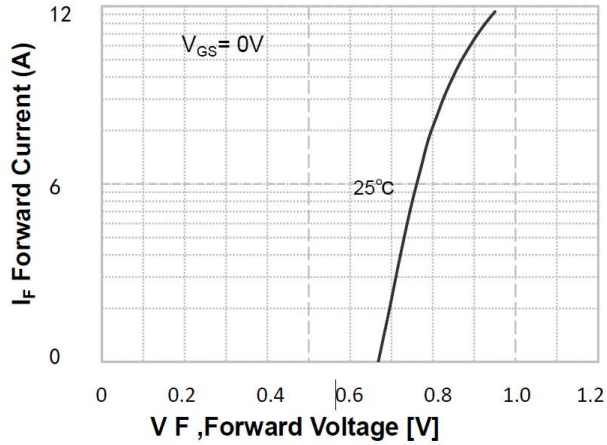


Figure 4. Body Diode Forward Voltage Variation with Source Current

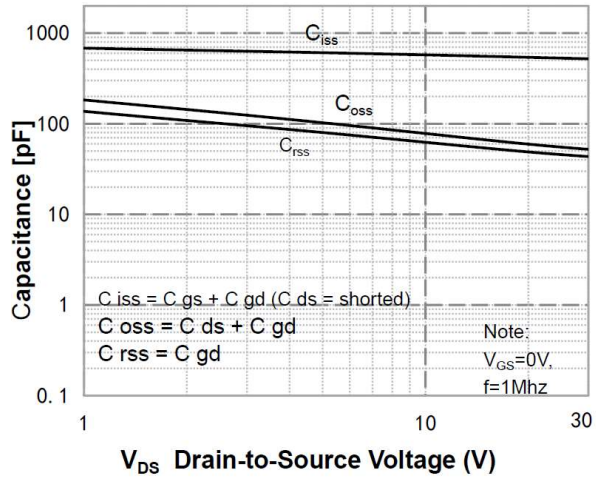


Figure 5. Capacitance Characteristics

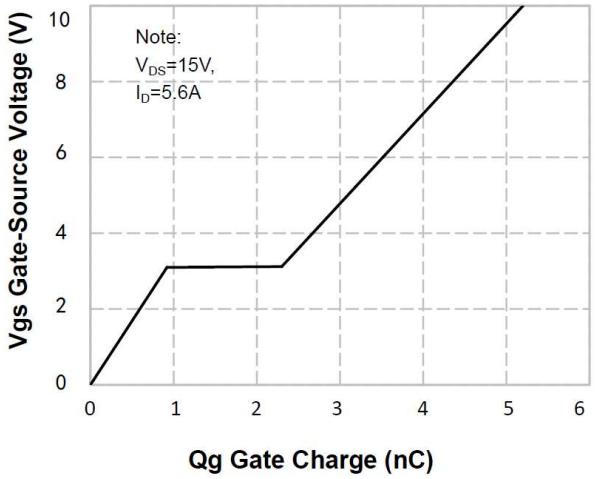


Figure 6. Gate Charge Characteristics

Typical Operating Characteristics(Cont.)

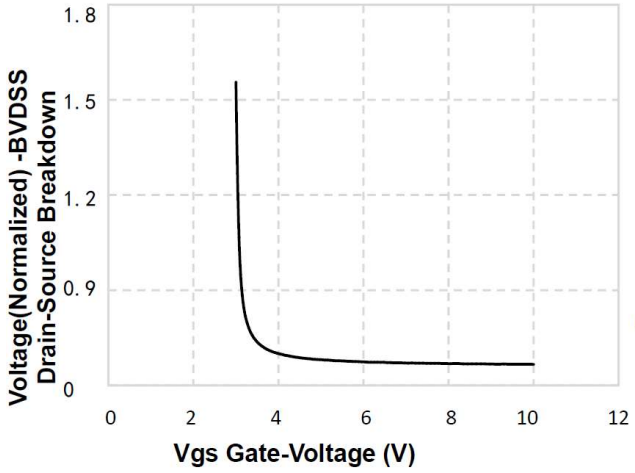


Figure 7. Breakdown Voltage Variation vs Gate-Voltage

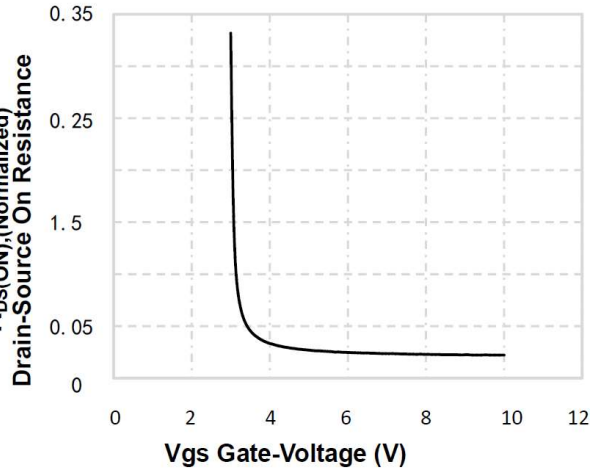


Figure 8. On-Resistance Variation vs Gate Voltage

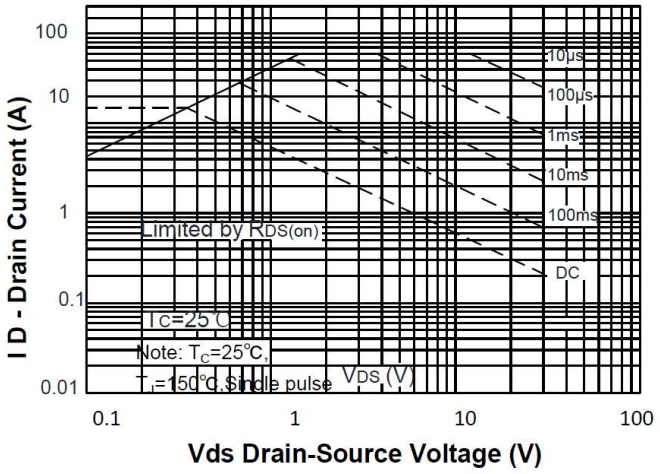


Figure 9. Maximum Safe Operating Area

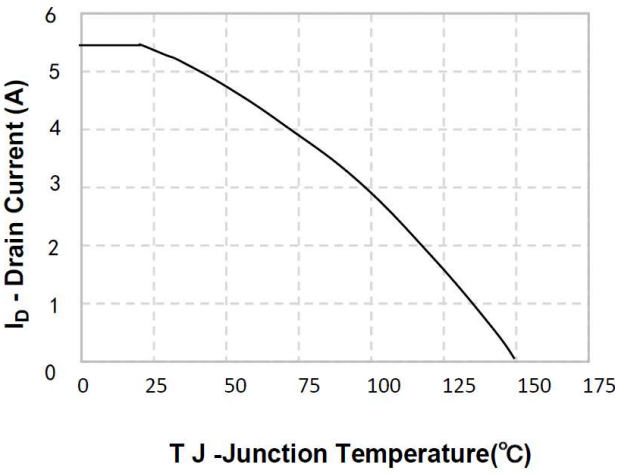


Figure 10. Maximum Continuous Drain Current vs Temperature

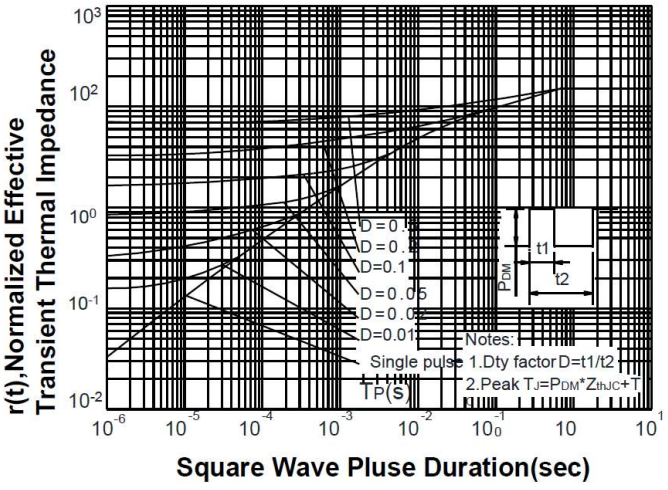
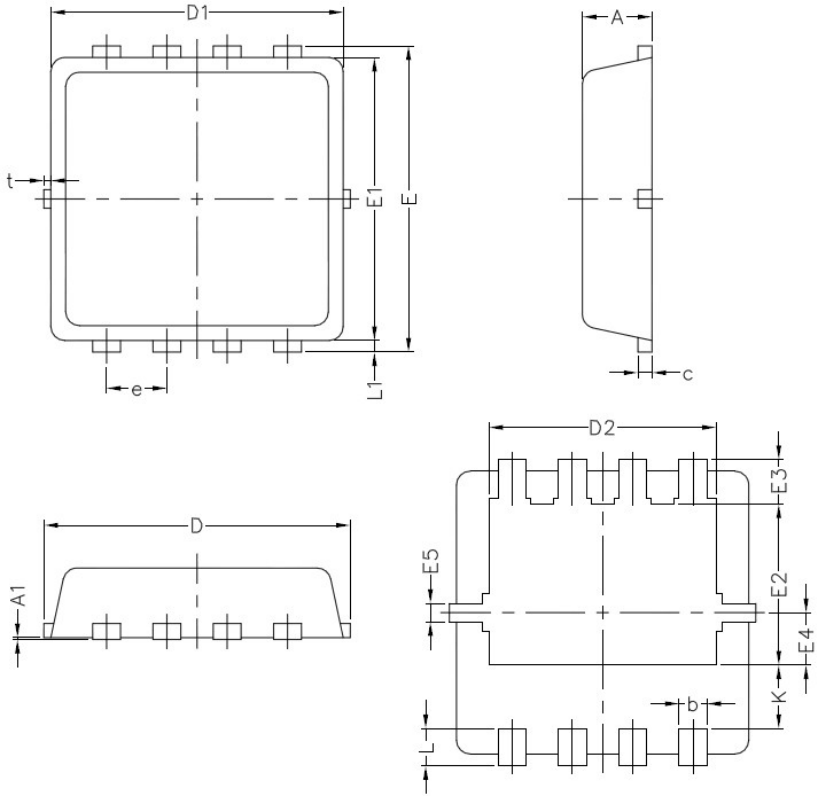


Figure 11. Transient Thermal Response Curve

Package Information

PPAK-3*3-8 Package



Symbol	PPAK-3*3-8(mm)		
	Min	Nom	Max
A	0.70	0.75	0.85
A1	/	/	0.05
b	0.20	0.30	0.40
c	0.10	0.152	0.25
D	3.15	3.3	3.45
D1	3.00	3.15	3.30
D2	2.25	2.45	2.65
E	3.15	3.30	3.45
E1	2.90	3.05	3.20
E2	1.54	1.74	1.94
E3	0.28	0.48	0.68
E4	0.37	0.57	0.77
E5	0.10	0.20	0.30
e	0.60	0.65	0.70
K	0.49	0.69	0.89
L	0.30	0.40	0.50
L1	0.06	0.125	0.20
t	/	/	0.13

Design Notes