

N-Channel Enhancement Mode MOSFET

TDM3482

**DESCRIPTION**

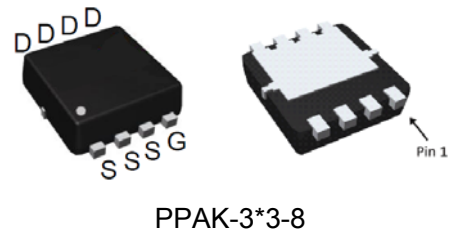
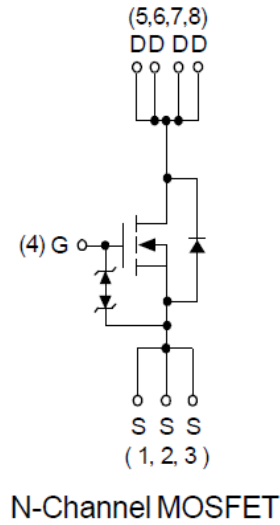
The TDM3482 uses advanced trench technology to provide excellent RDS(ON) and low gate charge. This device is suitable for use as a load switch or in PWM applications.

**GENERAL FEATURES**

- RDS(ON) < 16mΩ @ VGS=4.5V  
RDS(ON) < 9.5mΩ @ VGS=10V
- High Power and current handling capability
- ESD protection
- Lead free product is available
- Surface Mount Package

**Application**

- PWM applications
- Load switch
- Power management



**ABSOLUTE MAXIMUM RATINGS**(T<sub>A</sub>=25°C unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V <sub>DS</sub>	40	V
Gate-Source Voltage	V <sub>GS</sub>	±20	V
Diode Continuous Forward Current	I <sub>S</sub>	10	A
Drain Current @ Continuous	I <sub>D</sub> (T <sub>C</sub> =25°C)	43	A
	I <sub>D</sub> (T <sub>C</sub> =100°C)	28	A
Drain Current @ Current-Pulsed (Note 1)	I <sub>DM</sub> (T <sub>C</sub> =25°C)	60	A
Maximum Power Dissipation	P <sub>D</sub> (T <sub>C</sub> =25°C)	27.8	W
	P <sub>D</sub> (T <sub>C</sub> =100°C)	11.1	W
Drain Current @ Continuous	I <sub>D</sub> (T <sub>A</sub> =25°C)	12	A
	I <sub>D</sub> (T <sub>A</sub> =70°C)	9.6	A
Maximum Power Dissipation	P <sub>D</sub> (T <sub>A</sub> =25°C)	2.08	W
	P <sub>D</sub> (T <sub>A</sub> =70°C)	1.3	W
Maximum Operating Junction Temperature	T <sub>J</sub>	150	°C
Storage Temperature Range	T <sub>STG</sub>	-55 To 150	°C

**N-Channel Enhancement Mode MOSFET**
**TDM3482**
**THERMAL CHARACTERISTICS**

Thermal Resistance, Junction-to-Ambient (Note 4)	R <sub>θJA</sub> (t ≤ 10s)	40	°C/W
	R <sub>θJA</sub> (Steady State)	60	°C/W
Thermal Resistance-Junction to Case	R <sub>θJC</sub> (Steady State)	4.5	°C/W

**ELECTRICAL CHARACTERISTICS (T<sub>A</sub>=25°C unless otherwise noted)**

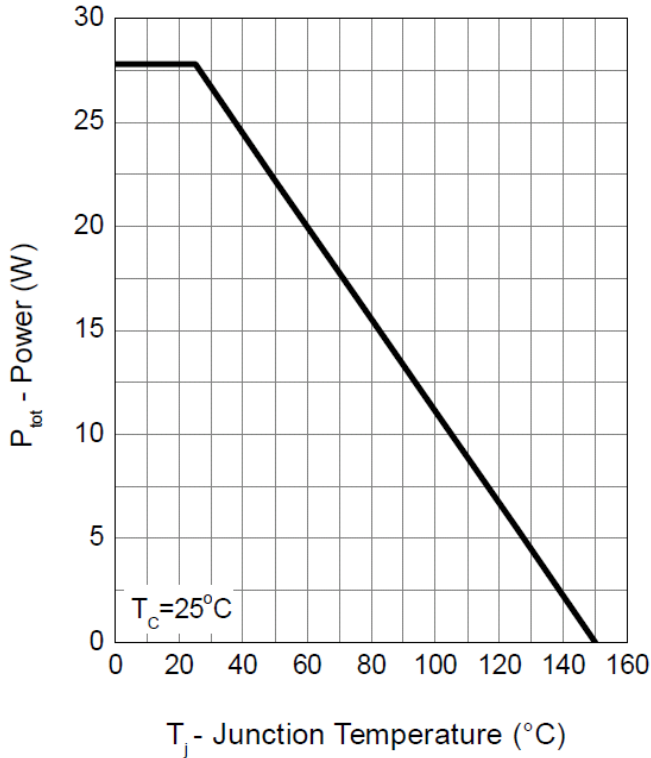
Parameter	Symbol	Condition	Min	Typ	Max	Unit
<b>OFF CHARACTERISTICS</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	V <sub>GS</sub> =0V I <sub>D</sub> =250μA	40	-	-	V
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =32V, V <sub>GS</sub> =0V	-	-	1	μA
Gate-Body Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V	-	-	±10	μA
<b>ON CHARACTERISTICS (Note 2)</b>						
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	1.4	1.7	2.5	V
Drain-Source On-State Resistance	R <sub>DS(ON)</sub>	V <sub>GS</sub> =4.5V, I <sub>D</sub> =8A	-	11.5	16	mΩ
		V <sub>GS</sub> =10V, I <sub>D</sub> =15A	-	7.9	9.5	mΩ
		T <sub>J</sub> =125°C	-	11.8	-	mΩ
<b>DYNAMIC CHARACTERISTICS (Note 3)</b>						
Gate Resistance	R <sub>G</sub>	V <sub>DS</sub> =20V, V <sub>GS</sub> =0V, F=1.0MHz	-	1.7	-	Ω
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =20V, V <sub>GS</sub> =0V, F=1.0MHz	-	700	-	PF
Output Capacitance	C <sub>oss</sub>		-	191	-	PF
Reverse Transfer Capacitance	C <sub>rss</sub>		-	30	-	PF
<b>SWITCHING CHARACTERISTICS (Note 3)</b>						
Turn-on Delay Time	t <sub>d(on)</sub>	V <sub>DS</sub> =20V, R <sub>L</sub> =20Ω, V <sub>GEN</sub> =10V, R <sub>G</sub> =6Ω I <sub>D</sub> =1A	-	10	-	nS
Turn-on Rise Time	t <sub>r</sub>		-	6.6	-	nS
Turn-Off Delay Time	t <sub>d(off)</sub>		-	18	-	nS
Turn-Off Fall Time	t <sub>f</sub>		-	12	-	nS
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> =20V, I <sub>D</sub> =15A, V <sub>GS</sub> =4.5V	-	5.1	-	nC
Gate-Source Charge	Q <sub>gs</sub>		-	2.9	-	nC
Gate-Drain Charge	Q <sub>gd</sub>		-	1.1	-	nC
Body Diode Reverse Recovery Time	T <sub>rr</sub>	I <sub>F</sub> =5A, di/dt=100A/μs	-	18.8	-	nS
Body Diode Reverse Recovery Charge	Q <sub>rr</sub>		-	4.5	-	nC
<b>DRAIN-SOURCE DIODE CHARACTERISTICS</b>						
Diode Forward Voltage (Note 2)	V <sub>SD</sub>	V <sub>GS</sub> =0V, I <sub>S</sub> =20A	-	0.8	1.1	V

**NOTES:**

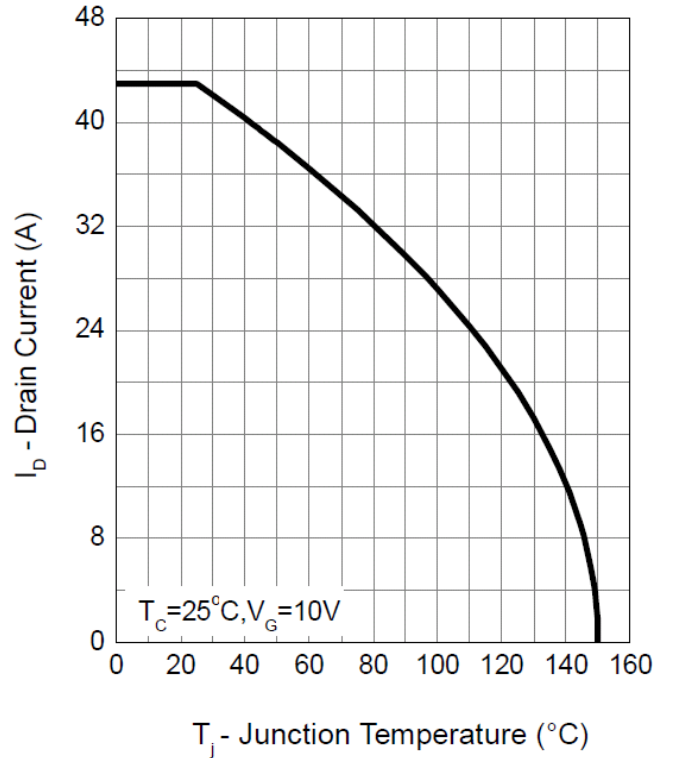
1. Pulse width limited by max. junction temperature.
2. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
3. Guaranteed by design, not subject to production testing
4. R<sub>θJA</sub> steady state t=100s. R<sub>θJA</sub> is measured with the device mounted on 1in2, FR-4 board with 2oz. Copper.

Typical Operating Characteristics

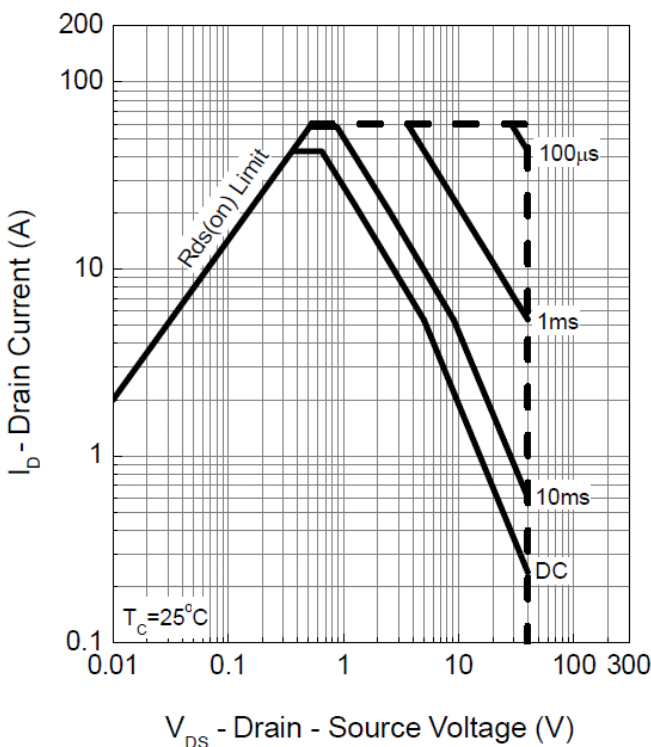
Power Dissipation



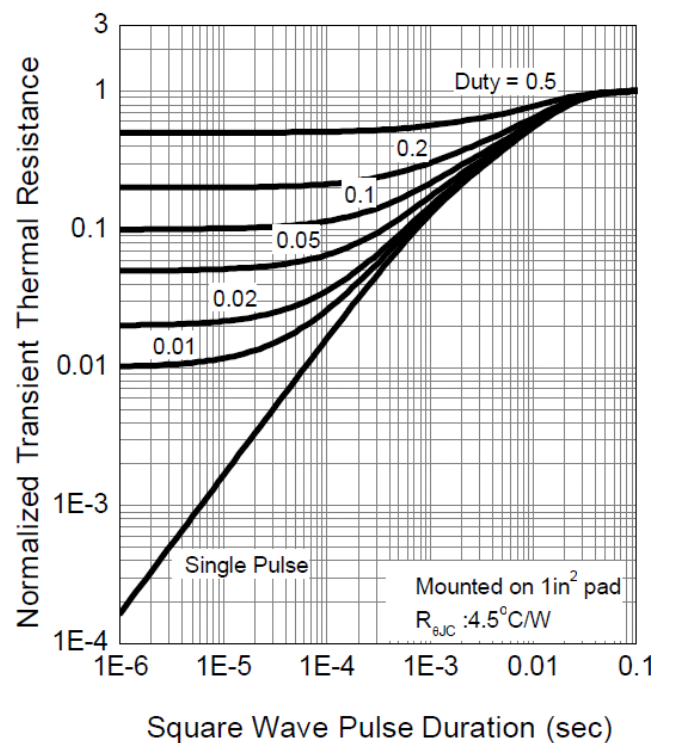
Drain Current



Safe Operation Area

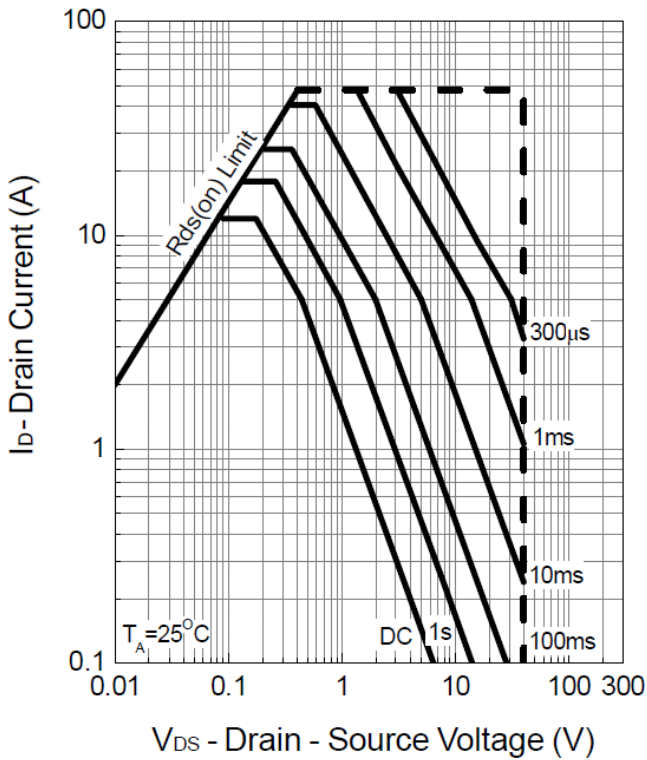


Thermal Transient Impedance

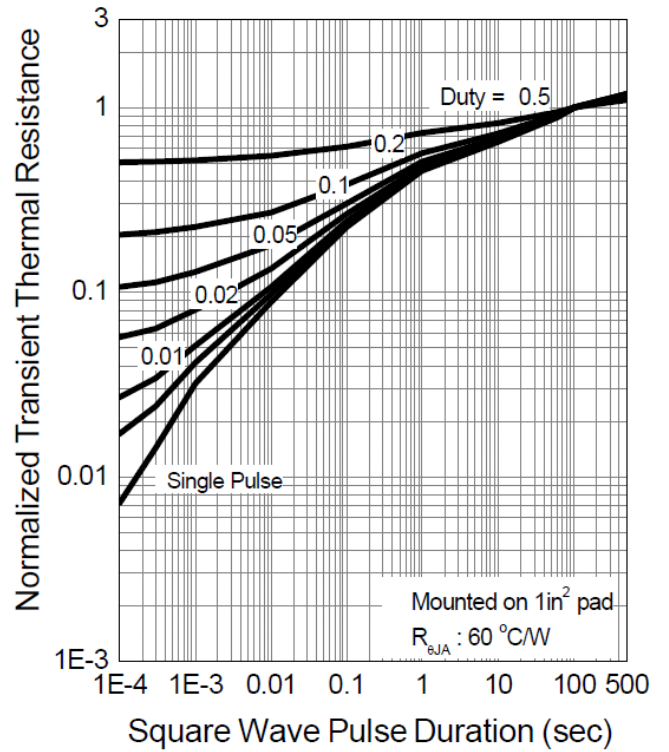


Typical Operating Characteristics(Cont.)

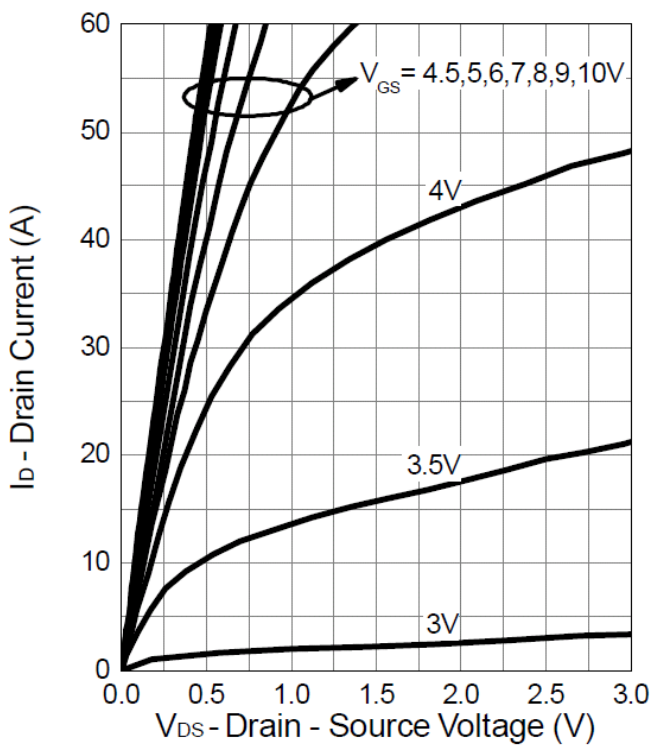
Safe Operation Area



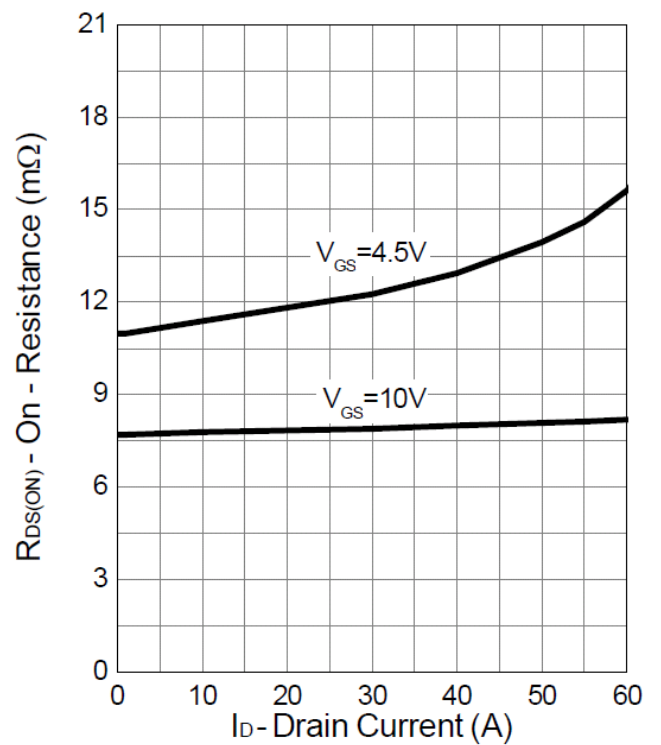
Thermal Transient Impedance



Output Characteristics

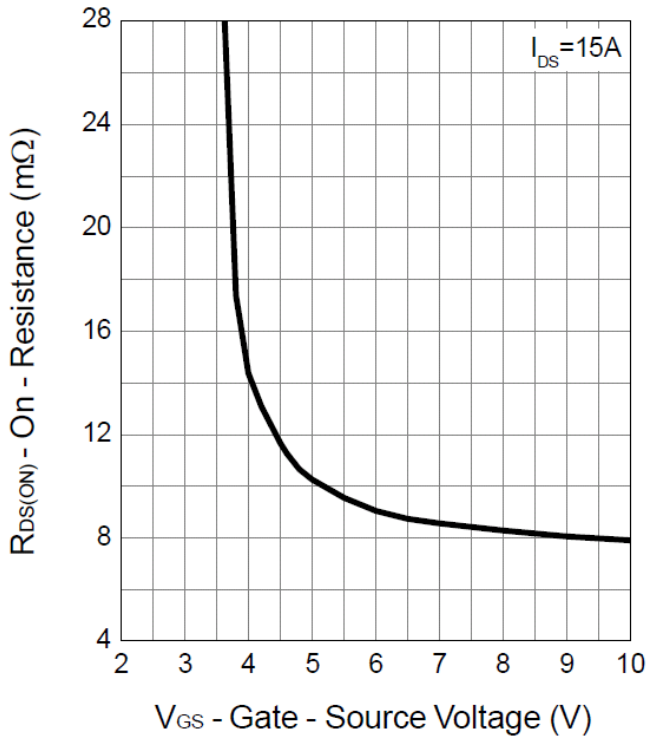


Drain-Source On Resistance

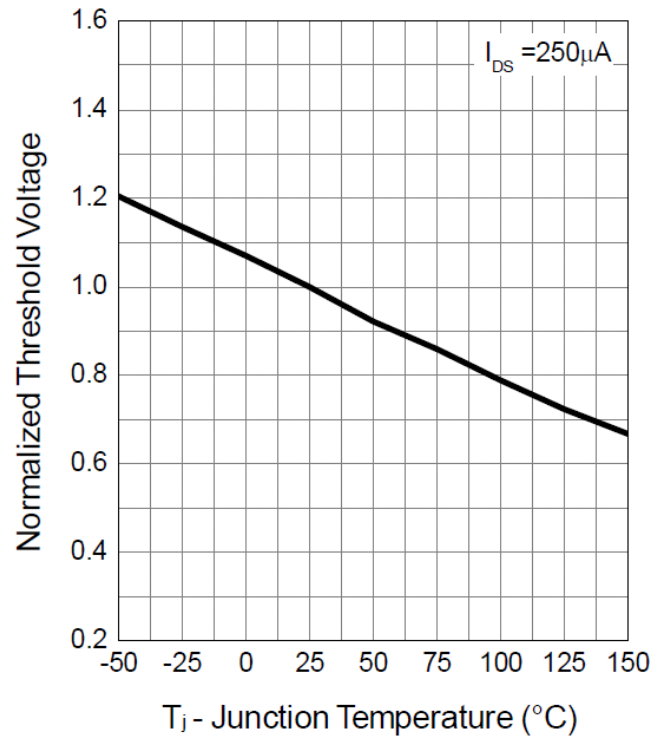


Typical Operating Characteristics(Cont.)

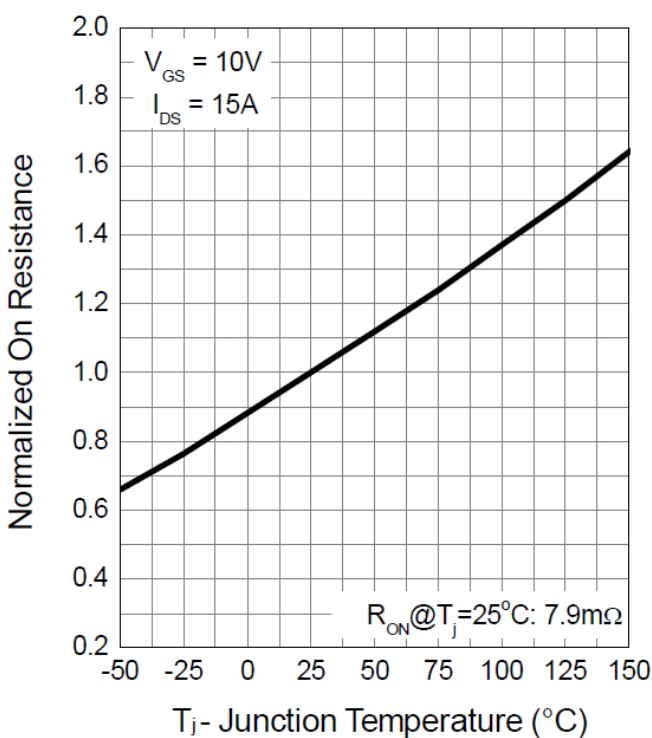
Gate-Source On Resistance



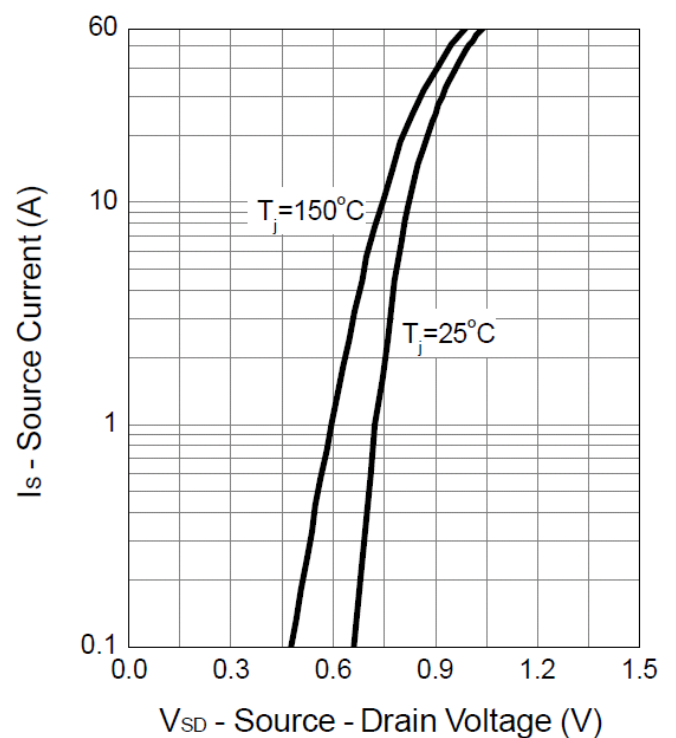
Gate Threshold Voltage



Drain-Source On Resistance

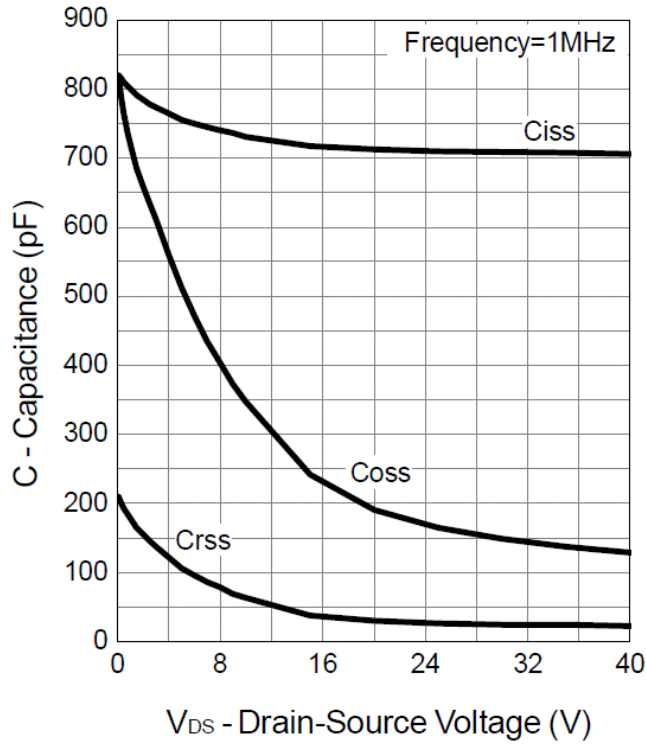


Source-Drain Diode Forward

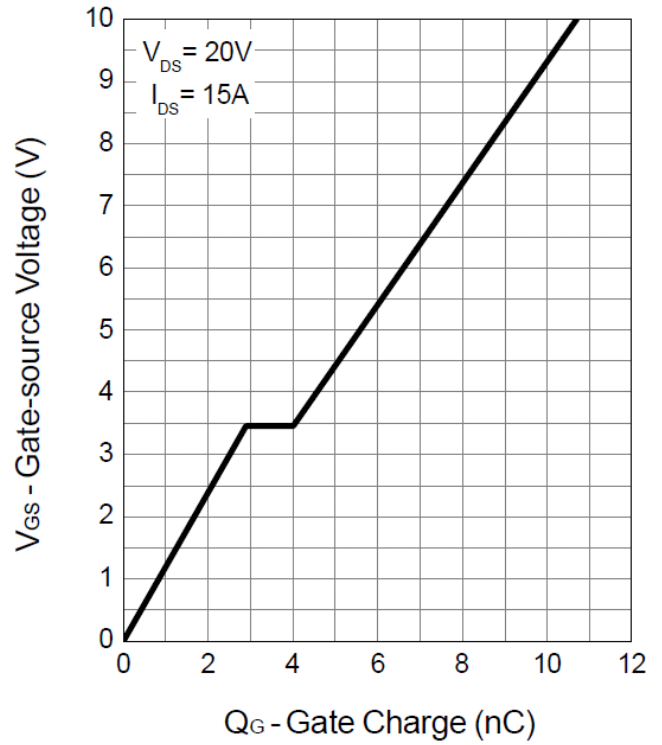


Typical Operating Characteristics(Cont.)

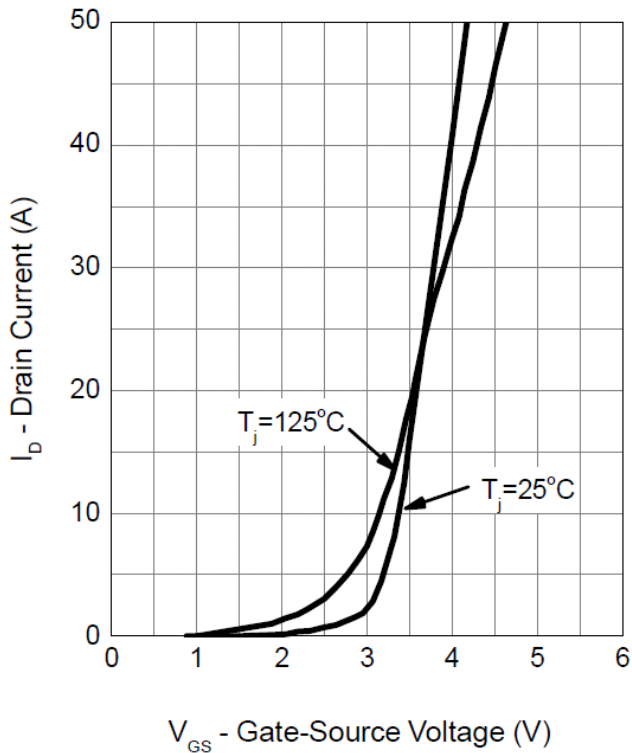
Capacitance



Gate Charge

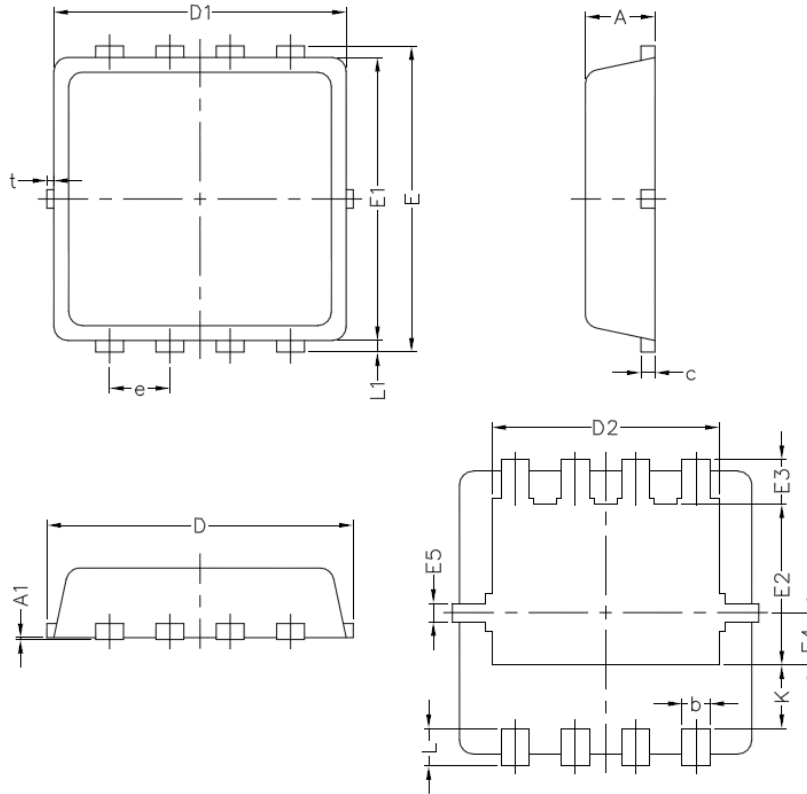


Transfer Characteristics



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