N-Channel Enhancement Mode MOSFET   TDM3726
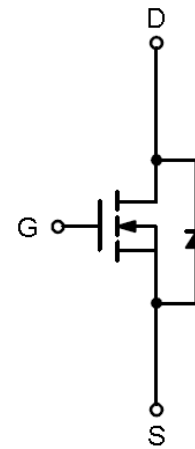
DESCRIPTION

The TDM3726 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.
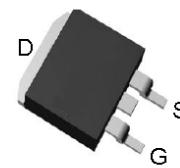
GENERAL FEATURES

- RDS(ON) < 3.3mΩ @ VGS=4.5V
  RDS(ON) < 2.6mΩ @ VGS=10V
- High Power and current handling capability
- Lead free product is available
- Surface Mount Package

Application

- PWM applications
- Load switch
- Power management

N-Channel MOSFET

Top View of TO-263-3

ABSOLUTE MAXIMUM RATINGS(T$_A$=25℃unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V$_{DS}$	40	V
Gate-Source Voltage	V$_{GS}$	+20	V
Drain Current @ Continuous(Silicon Limited)	I$_D$（T$_C$=25℃）	200	A
	I$_D$（T$_C$=100℃）	142	A
Drain Current @ Continuous(Package Limited)	I$_D$（T$_C$=25℃）	69	A
Drain Current @ Current-Pulsed (Note 1)	I$_{DM}$（T$_C$=25℃）	540	A
Maximum Power Dissipation	P$_D$ (T$_C$=25℃)	250	W
Avalanche Energy, Single Pulse	EAS(L=0.4mH)	320	mJ
Maximum Operating Junction Temperature	T$_J$	150	℃
Storage Temperature Range	T$_{STG}$	-55 To 150	℃

THERMAL CHARACTERISTICS

Thermal Resistance,Junction-to-Case	R$_{θJC}$	0.6	℃/W
Thermal Resistance,Junction-to-Ambient (Note 1)	R$_{θJA}$	60	℃/W

N-Channel Enhancement Mode MOSFET   TDM3726

ELECTRICAL CHARACTERISTICS (T$_A$=25℃ unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Static 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	μA
Gate-Body Leakage Current	I$_{GSS}$	V$_{GS}$=±20V,V$_{DS}$=0V	-	-	±100	nA
Gate Threshold Voltage	V$_{GS(th)}$	V$_{DS}$=VGS,I$_D$=250μA	1	1.8	2.2	V
Drain-Source On-State Resistance	R$_{DS(ON)}$	V$_{GS}$=4.5V, I$_D$=20A	-	2.6	3.3	mΩ
		V$_{GS}$=10V, I$_D$=20A	-	2.2	2.6	mΩ
DYNAMIC CHARACTERISTICS (Note3)						
Input Capacitance	C$_{iss}$	V$_{DS}$=20V,V$_{GS}$=0V, F=1.0MHz	-	7356	-	PF
Output Capacitance	C$_{oss}$		-	814	-	PF
Reverse Transfer Capacitance	C$_{rss}$		-	547	-	PF
Turn-on Delay Time	t$_{d(on)}$	V$_{DS}$=20V, R$_L$=10Ω, V$_{GEN}$=10V, R$_G$=10Ω I$_D$=20A	-	26	-	nS
Turn-on Rise Time	t$_r$		-	21	-	nS
Turn-Off Delay Time	t$_{d(off)}$		-	75	-	nS
Turn-Off Fall Time	t$_f$		-	25	-	nS
Total Gate Charge	Q$_g$	V$_{DS}$=20V,I$_D$=20A,V$_{GS}$=10V	-	70	-	nC
Gate-Source Charge	Q$_{gs}$		-	20	-	nC
Gate-Drain Charge	Q$_{gd}$		-	35	-	nC
Body Diode Reverse Recovery Time	T$_{rr}$	I$_F$=20A, dI/dt=200A/μs	-	40	-	nS
Body Diode Reverse Recovery Charge	Q$_{rr}$		-	50	-	nC
DRAIN-SOURCE DIODE CHARACTERISTICS						
Diode Forward Voltage (Note 2)	V$_{SD}$	V$_{GS}$=0V,I$_S$=20A	-	0.9	1.2	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

N-Channel Enhancement Mode MOSFET TDM3726

Typical Operating Characteristics

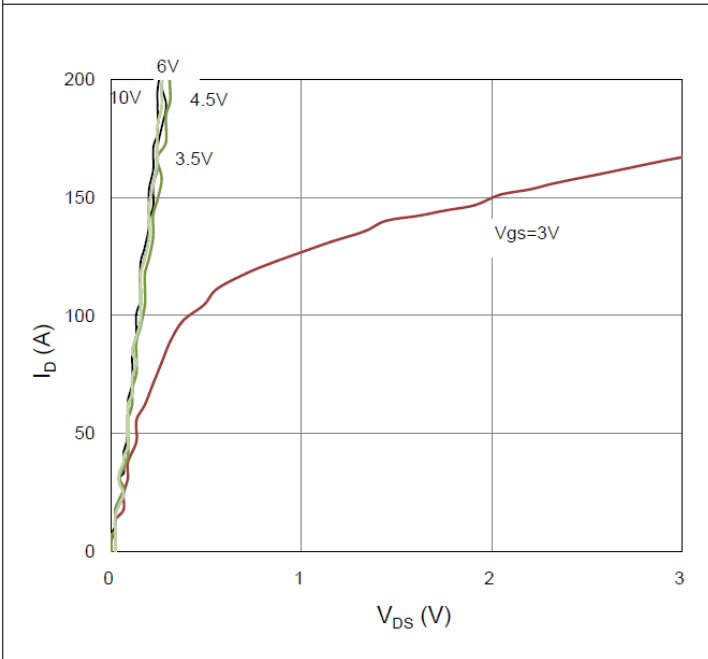Fig 1. Typical Output Characteristics

Figure 2. On-Resistance vs. Gate-Source Voltage
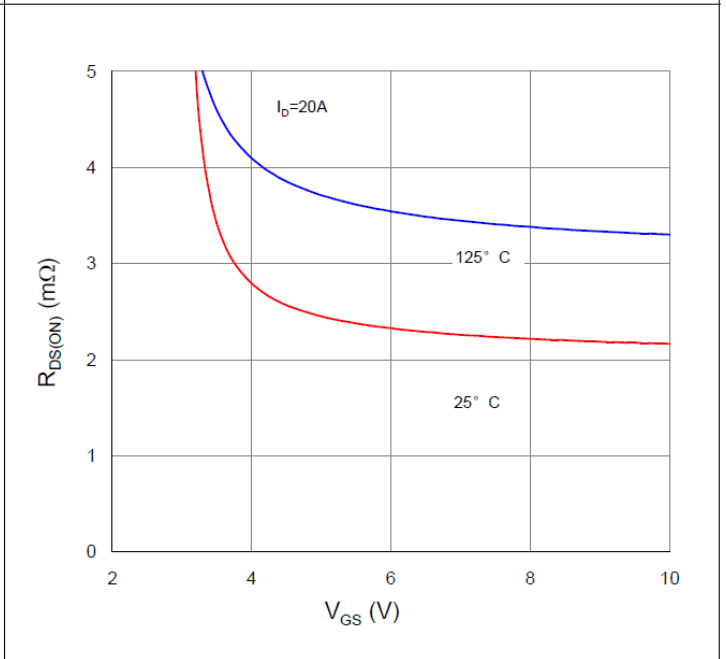

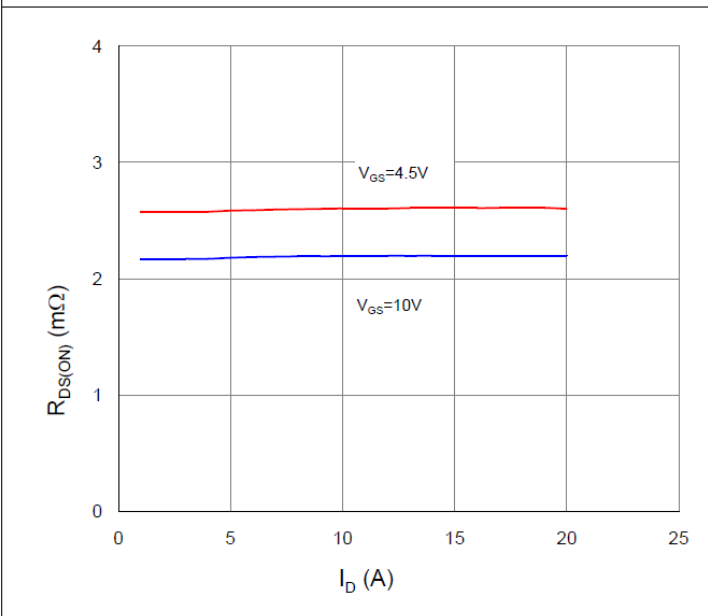Figure 3. On-Resistance vs. Drain Current and Gate Voltage
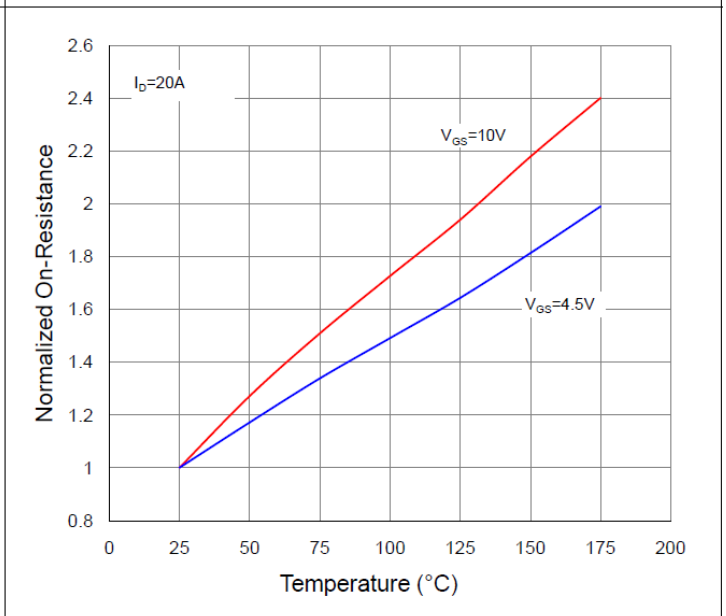

Figure 4. Normalized On-Resistance vs. Junction Temperature

Typical Operating Characteristics(Cont.)
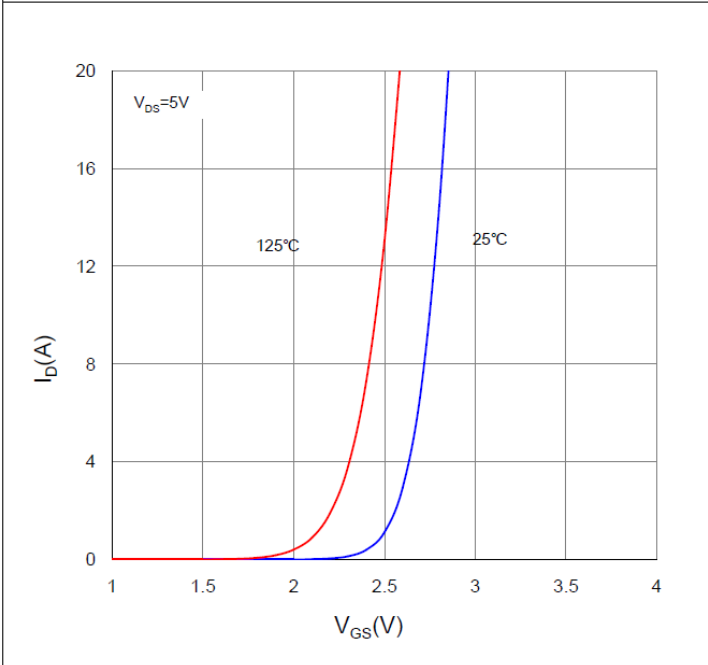
Figure 5. Typical Transfer Characteristics

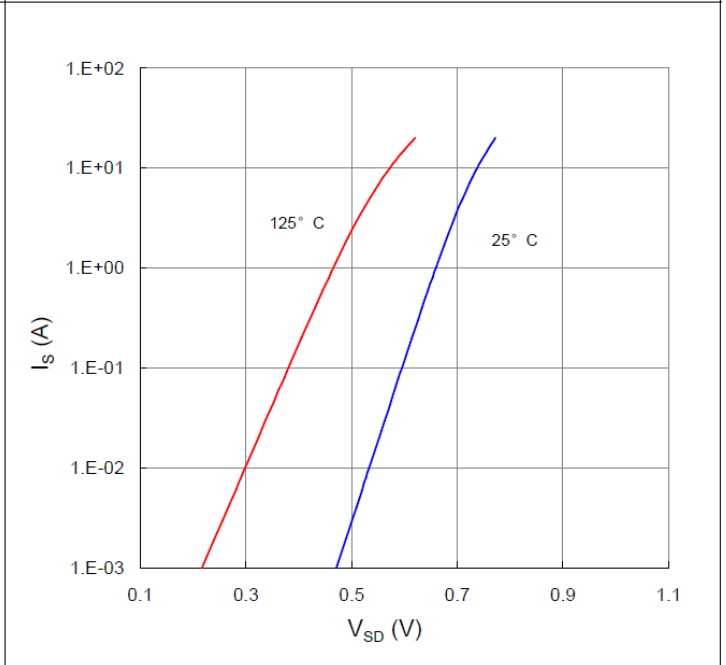
Figure 6. Typical Source-Drain Diode Forward Voltage

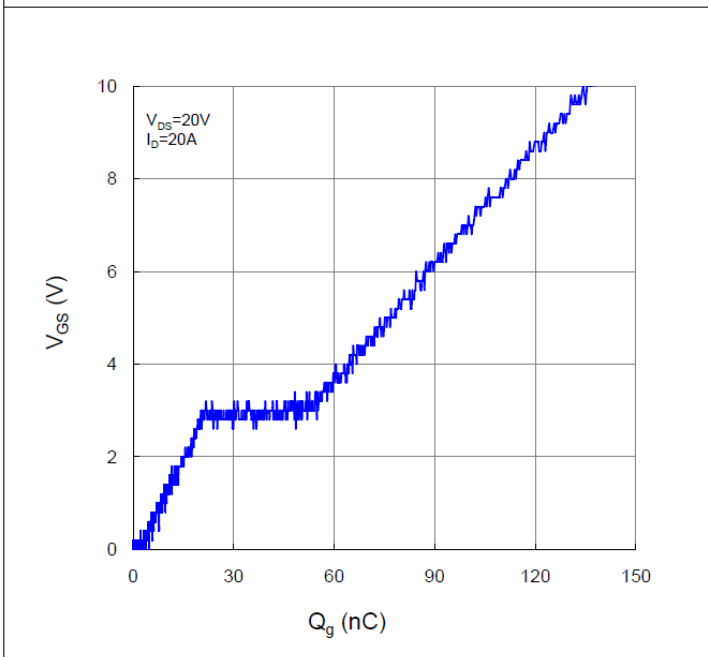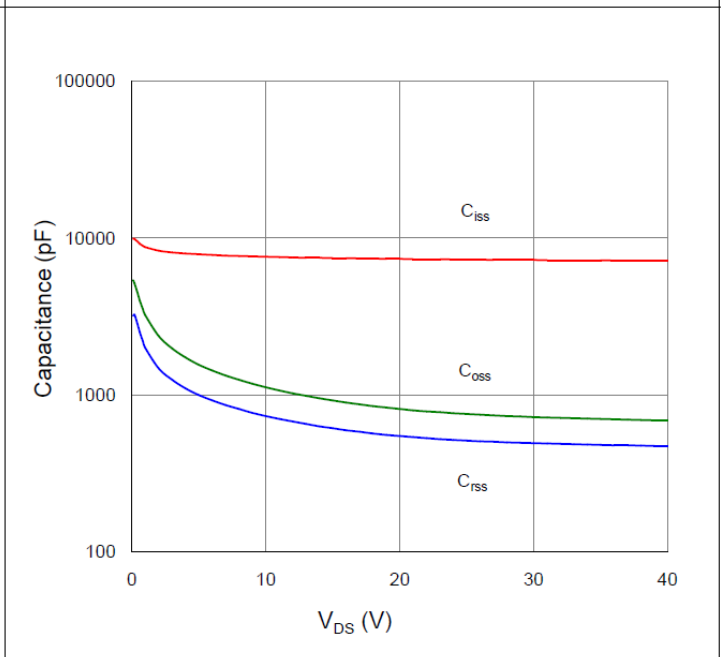Figure 7. Typical Gate-Charge vs. Gate-to-Source Voltage

Figure 8. Typical Capacitance vs. Drain-to-Source Voltage

Typical Operating Characteristics (Cont.)
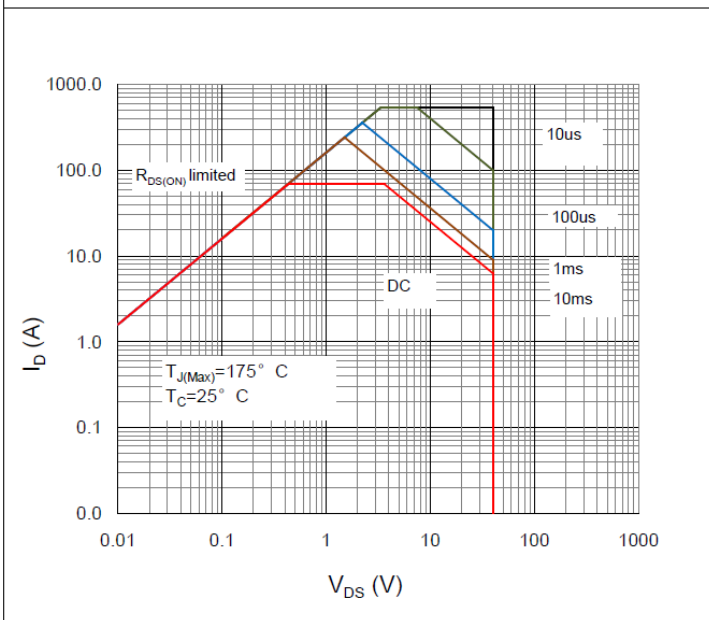

Figure 9. Maximum Safe Operating Area
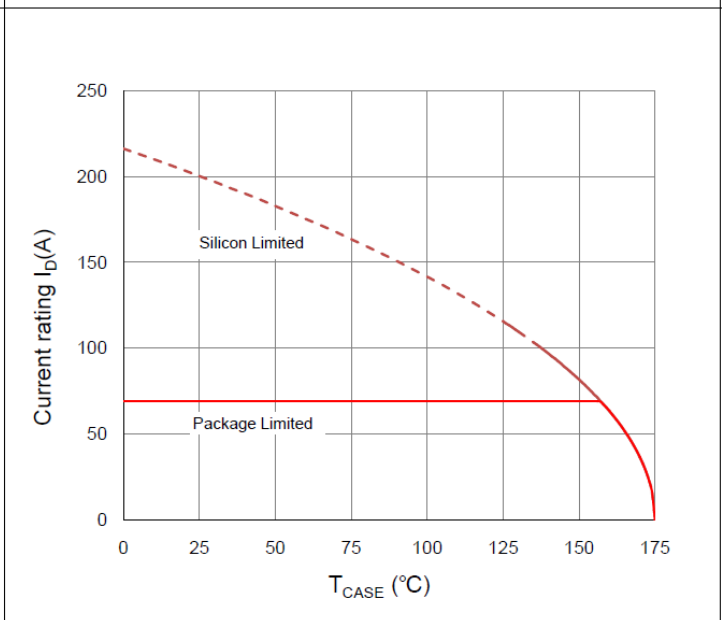

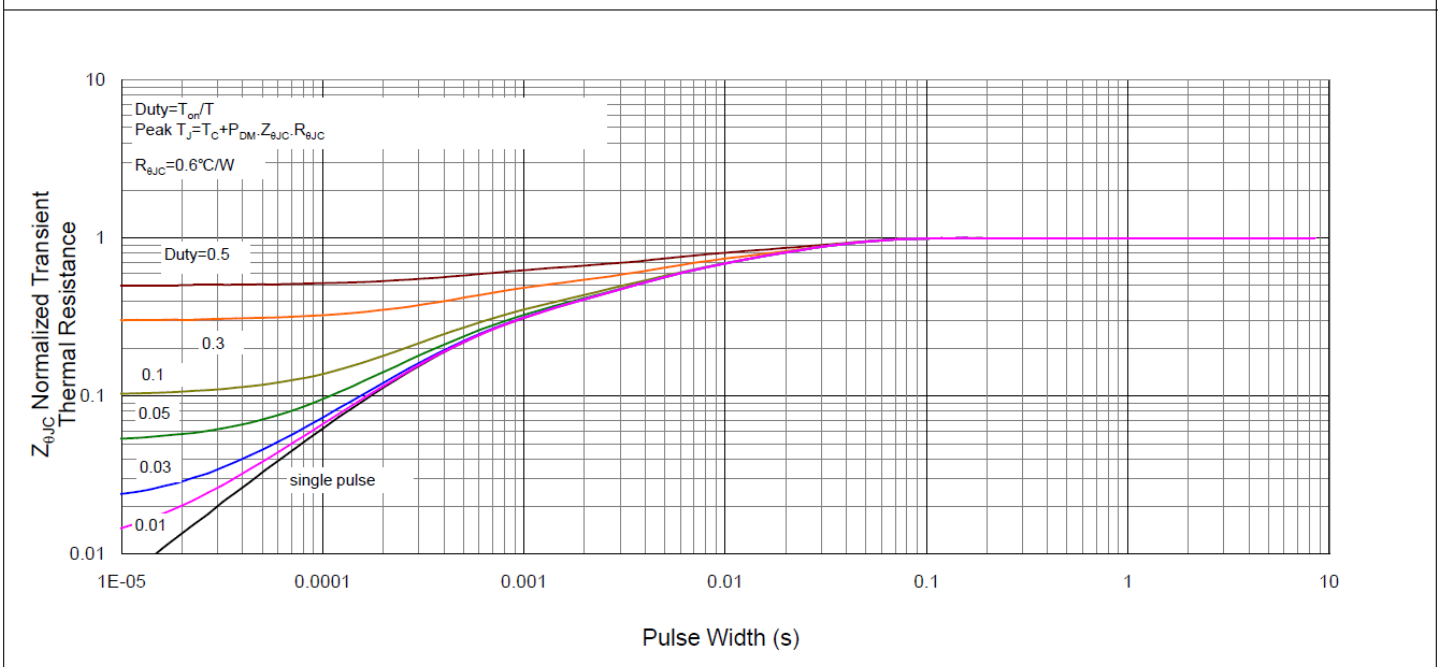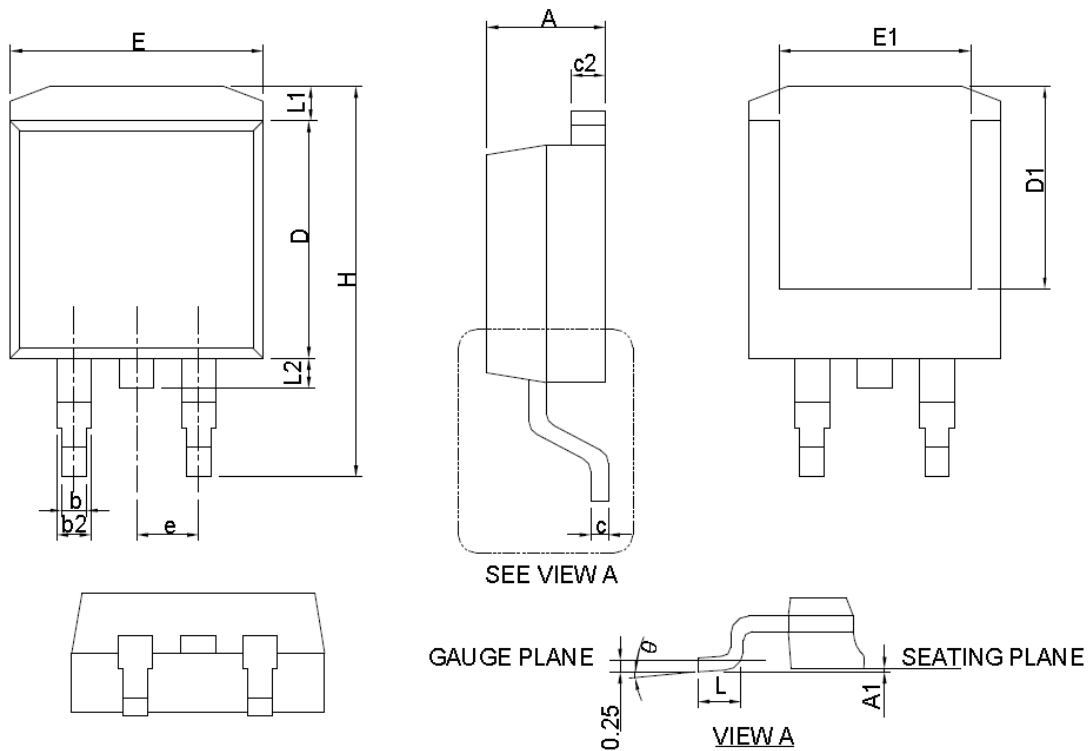Figure 10. Maximun Drain Current vs. Case Temperature

Figure 11. Normalized Maximum Transient Thermal Impedance, Junction-to-Case

Package Information

TO263-3   Package

SEE VIEW A

GAUGE PLANE

SEATING PLANE

VIEW A

S Y M B O L	TO-263-3			
	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	4.06	4.83	0.160	0.190
A1	0.00	0.25	0.000	0.010
b	0.51	0.99	0.020	0.039
b2	1.14	1.78	0.045	0.070
c	0.38	0.74	0.015	0.029
c2	1.14	1.65	0.045	0.065
D	8.38	9.65	0.330	0.380
D1	6.00	9.00	0.236	0.354
E	9.65	11.43	0.380	0.450
E1	6.22	9.00	0.245	0.354
e	2.54 BSC		0.100 BSC	
H	14.61	15.88	0.575	0.625
L	1.78	2.79	0.070	0.110
L1	-	1.68	-	0.066
L2	-	1.78	-	0.070
θ	0°	8°	0°	8°

Note : Follow JEDEC TO-263 AB.

RECOMMENDED LAND PATTERN

8.5 MIN.

9.0 MIN.

10.5

1.6 MIN.

4.0 MIN.

5.08

UNIT: mm

Design Notes

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