N-Channel Enhancement Mode MOSFET TDM31526

DESCRIPTION

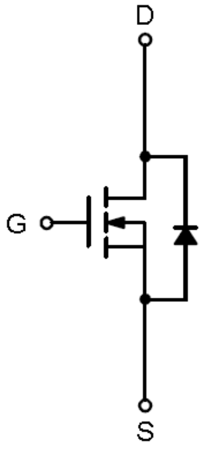
The TDM31526 uses advanced trench technology to provide excellent RDS(ON) and low gate charge. This device is suitable for use as a load switch or in PWM applications.

GENERAL FEATURES

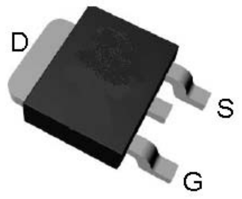
- RDS(ON) < 38mΩ @ VGS=10V
- High Power and current handling capability
- Lead free product is available
- Surface Mount Package

Application

- PWM applications
- Load switch
- Power management



N-Channel MOSFET



Top View of TO-252-2

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

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	150	V
Gate-Source Voltage	V_{GS}	±25	V
Drain Current @ Continuous	I_D（T_A=25℃）	5	A
	I_D（T_A=70℃）	4	A
Drain Current @ Current-Pulsed (Note 1)	I_{DM}（T_C=25℃）	105	A
Maximum Power Dissipation (T_A=25℃)	P_D	2.5	W
Maximum Operating Junction Temperature	T_J	150	℃
Storage Temperature Range	T_{STG}	-55 To 150	℃

THERMAL CHARACTERISTICS

Thermal Resistance,Junction-to-Ambient (Note 1)	$R_{\theta JA}$	50	℃/W

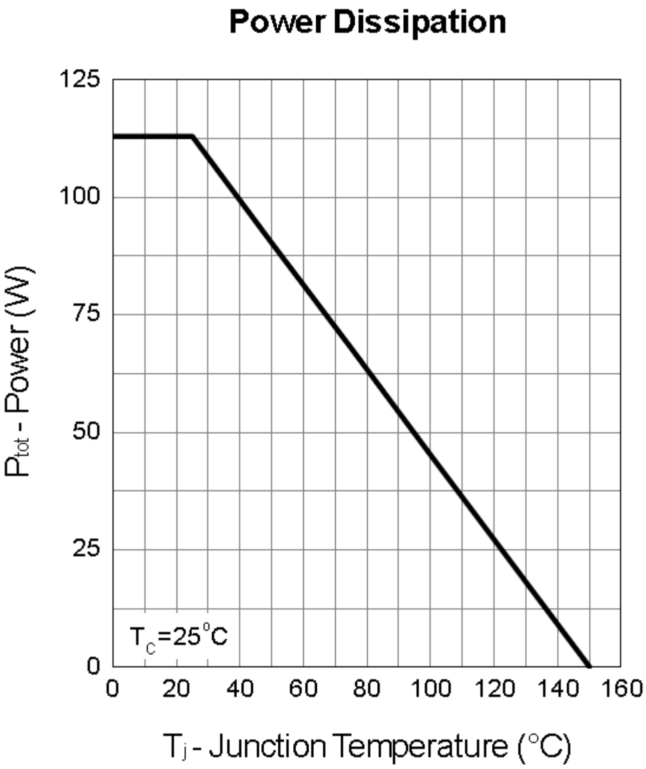
ELECTRICAL CHARACTERISTICS (T_A=25℃unless otherwise noted)

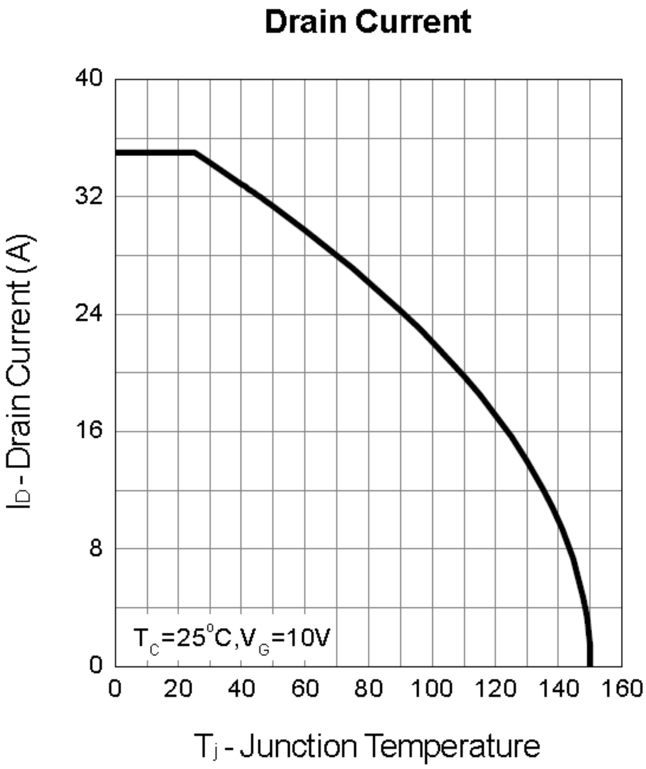
Parameter	Symbol	Condition	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V I_D=250μA	150			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=120V,V_{GS}=0V			1	μA
Gate-Body Leakage Current	I_{GSS}	V_{GS}=±25V,V_{DS}=0V			±100	nA
ON CHARACTERISTICS (Note 2)						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=VGS,I_D=250μA	2	3	4	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=20A		32	38	mΩ
DYNAMIC CHARACTERISTICS (Note4)						
Input Capacitance	C_{iss}	V_{DS}=30V,V_{GS}=0V, F=1.0MHz		2300	2990	PF
Output Capacitance	C_{oss}			190		PF
Reverse Transfer Capacitance	C_{rss}			40		PF
SWITCHING CHARACTERISTICS (Note 3)						
Turn-on Delay Time	$t_{d(on)}$	V_{DS}=30V, R_L=30Ω, V_{GEN}=10V,R_G=1Ω I_D=1A		21	28	nS
Turn-on Rise Time	t_r			7	13	nS
Turn-Off Delay Time	$t_{d(off)}$			40	72	nS
Turn-Off Fall Time	t_f			16	29	nS
Total Gate Charge	Q_g	V_{DS}=75V,I_D=20A,V_{GS}=10V		37	52	nC
Gate-Source Charge	Q_{gs}			12		nC
Gate-Drain Charge	Q_{gd}			7		nC
Body Diode Reverse Recovery Time	T_{rr}	I_F=10A, dI/dt=100A/μs		88		nS
Body Diode Reverse Recovery Charge	Q_{rr}			190		nC
DRAIN-SOURCE DIODE CHARACTERISTICS						
Diode Forward Voltage (Note 2)	V_{SD}	V_{GS}=0V,I_S=10A		0.8	1.3	V

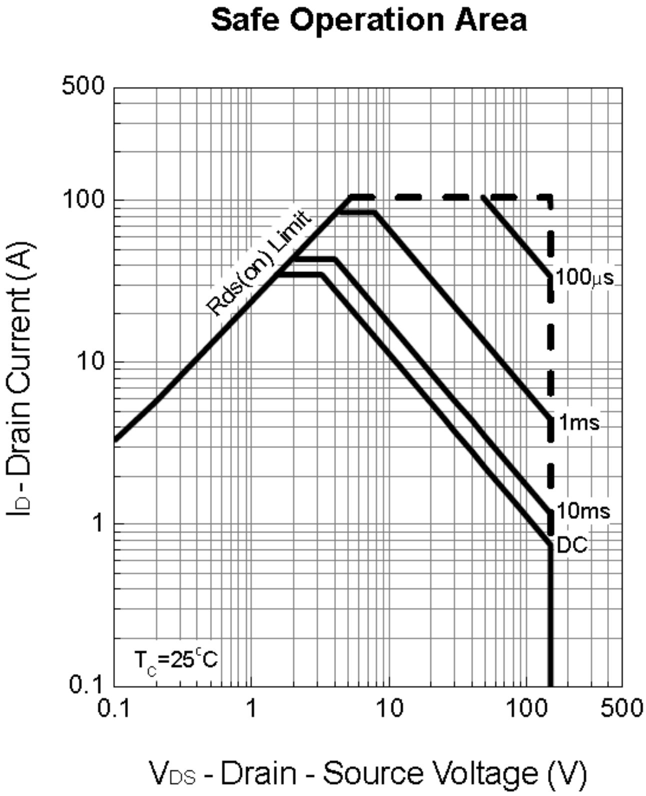
NOTES:

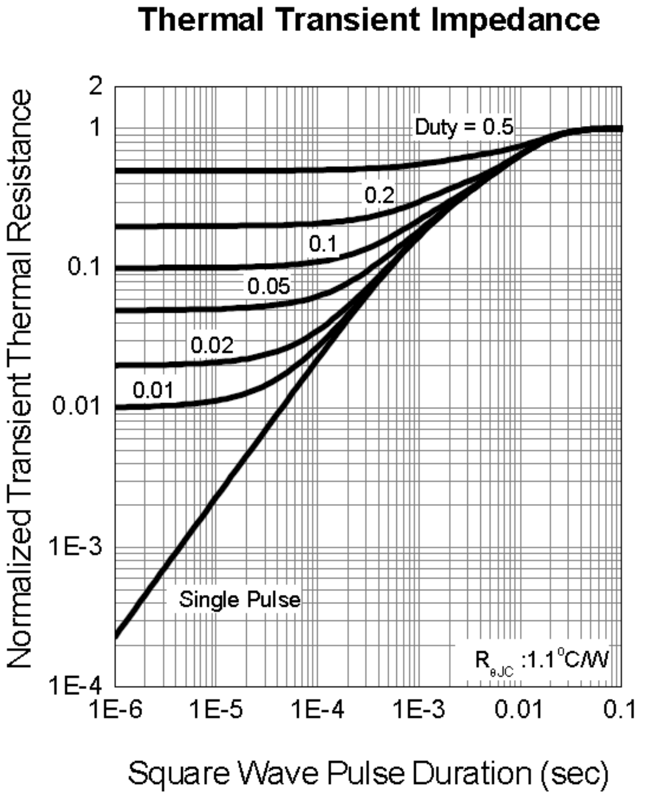
1. Pulse width limited by max. junction temperature.
2. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
3. Guaranteed by design, not subject to production testing

Typical Operating Characteristics



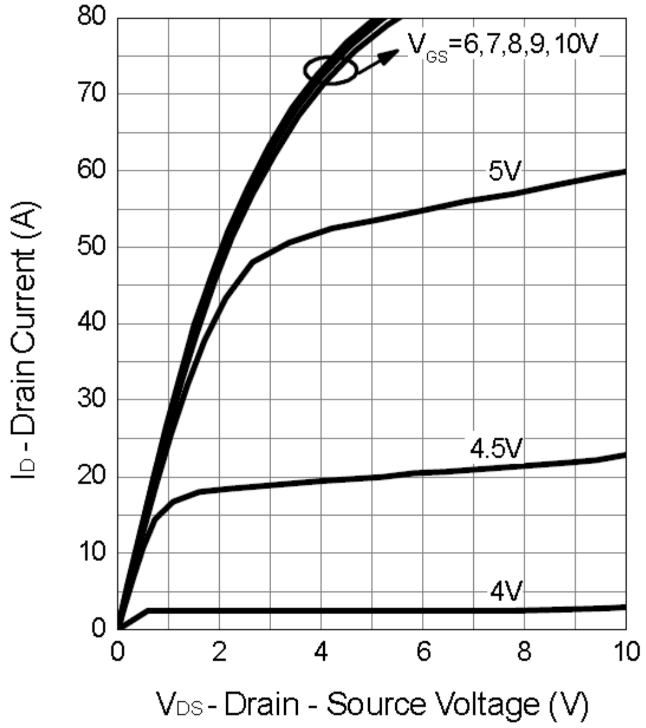




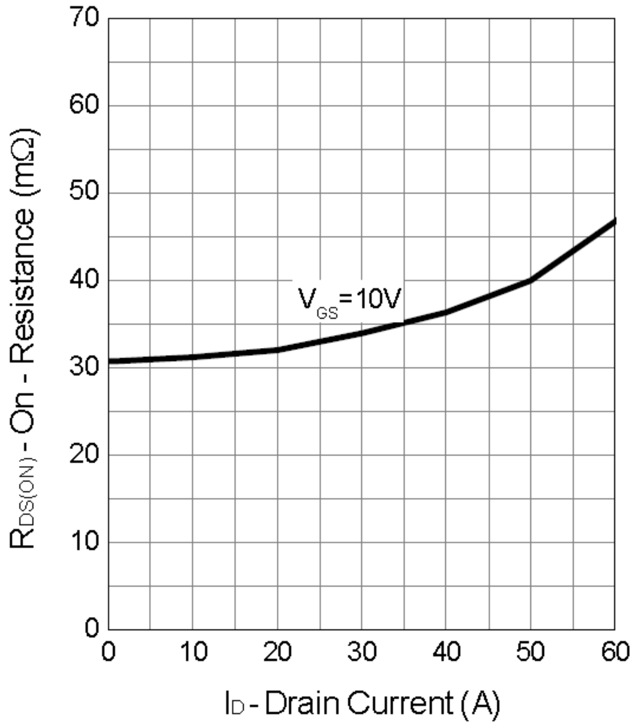


Typical Operating Characteristics(Cont.)

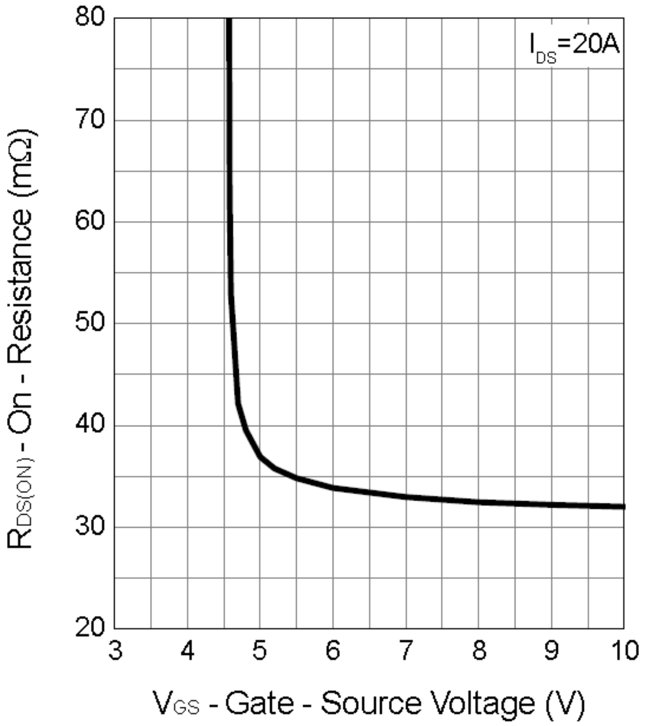
Output Characteristics



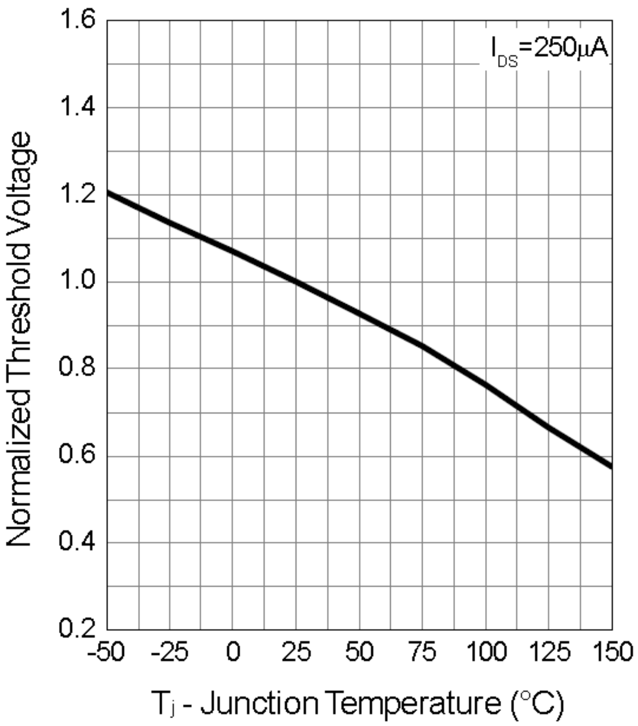
Drain-Source On Resistance



Gate-Source On Resistance

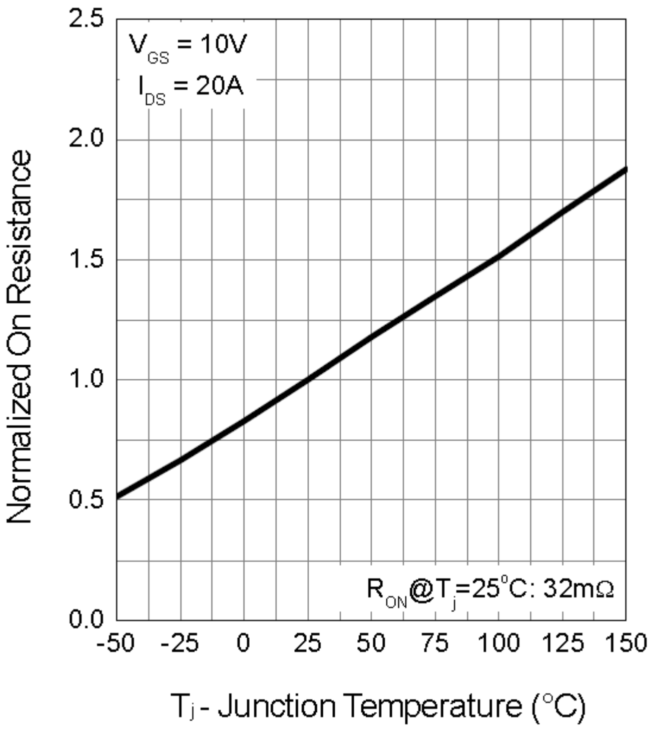


Gate Threshold Voltage

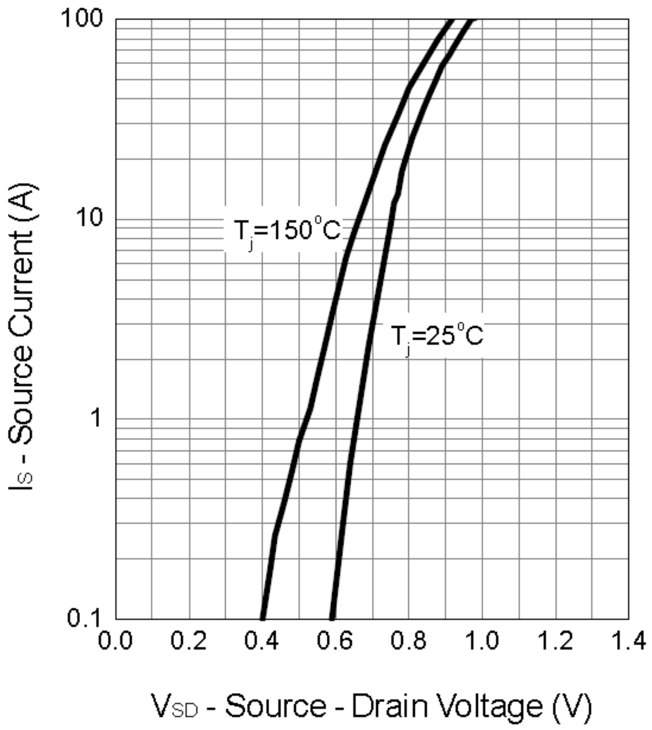


Typical Operating Characteristics (Cont.)

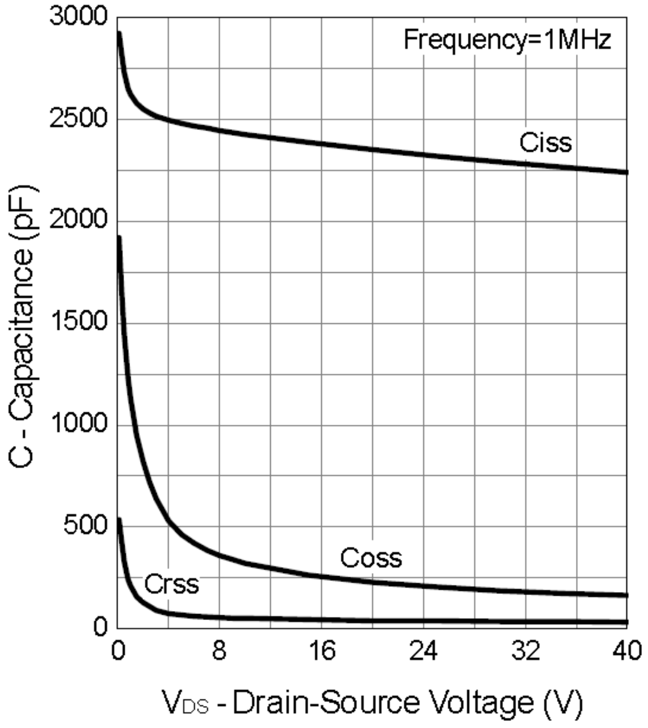
Drain-Source On Resistance



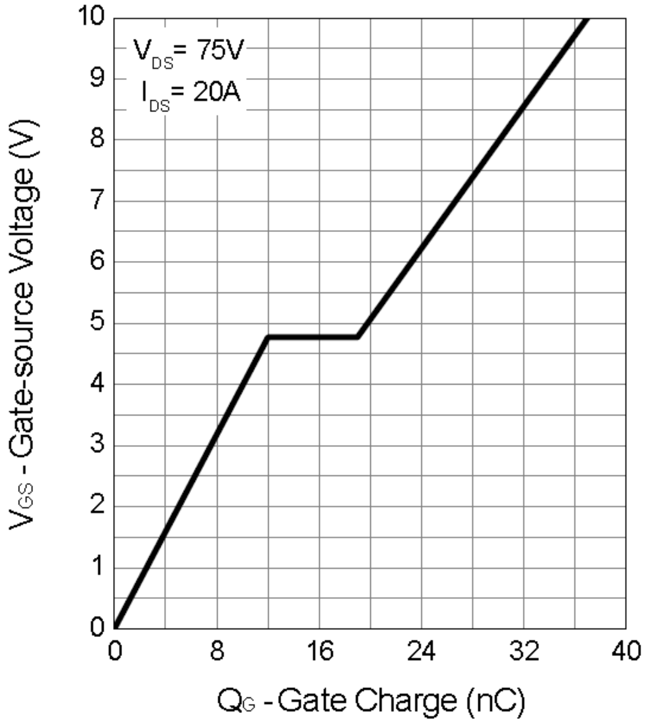
Source-Drain Diode Forward



Capacitance

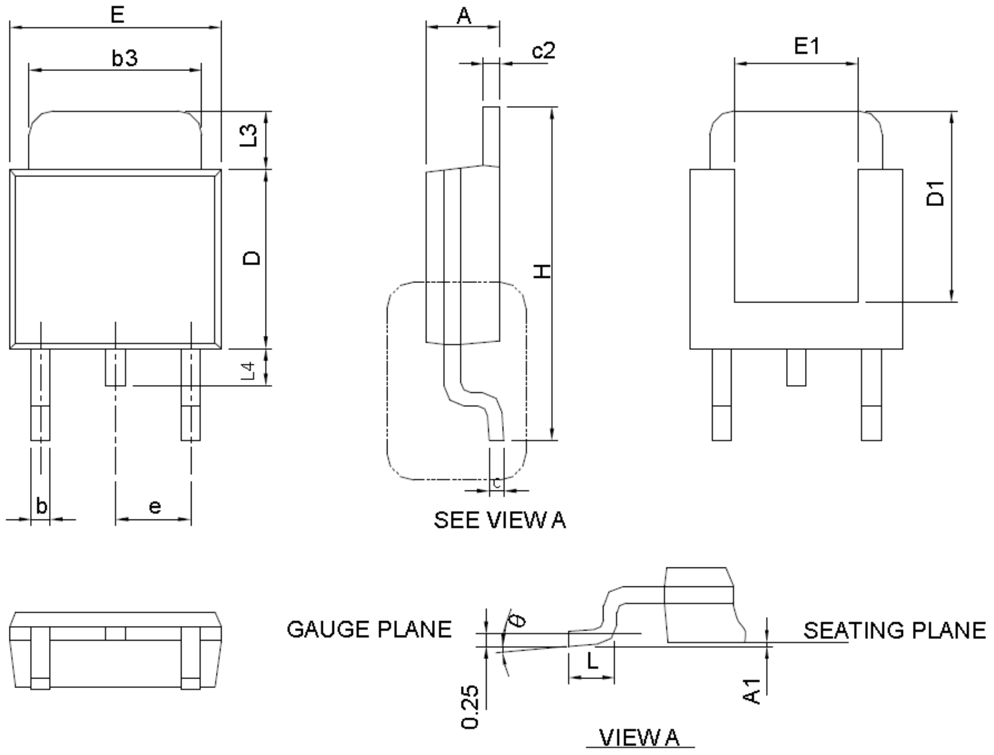


Gate Charge



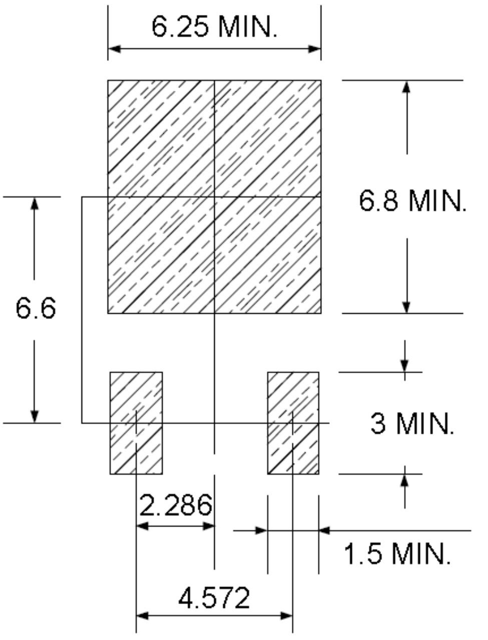
Package Information

TO252-2 Package



SYMBOL	TO-252-2			
	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	2.18	2.39	0.086	0.094
A1	-	0.13	-	0.005
b	0.50	0.89	0.020	0.035
b3	4.95	5.46	0.195	0.215
c	0.46	0.61	0.018	0.024
c2	0.46	0.89	0.018	0.035
D	5.33	6.22	0.210	0.245
D1	4.57	6.00	0.180	0.236
E	6.35	6.73	0.250	0.265
E1	3.81	6.00	0.150	0.236
e	2.29 BSC		0.090 BSC	
H	9.40	10.41	0.370	0.410
L	0.90	1.78	0.035	0.070
L3	0.89	2.03	0.035	0.080
L4	-	1.02	-	0.040
θ	0°	8°	0°	8°

RECOMMENDED LAND PATTERN



UNIT: mm

Design Notes