N-Channel Enhancement Mode MOSFET TDM3434

DESCRIPTION

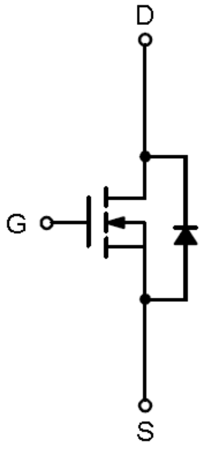
The TDM3434 uses advanced trench technology to provide excellent RDS(ON) and low gate charge. This device is suitable for use as a load switch or in PWM applications.

GENERAL FEATURES

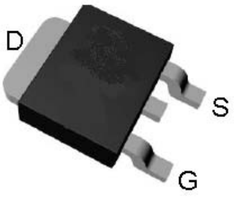
- RDS(ON) < 4mΩ @ VGS=4.5V
  RDS(ON) < 2.9mΩ @ VGS=10V
- High Power and current handling capability
- Lead free product is available
- Surface Mount Package

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}	40	V
Gate-Source Voltage	V_{GS}	$\pm$20	V
Drain Current @ Continuous	I_D（T_C=25℃）	100	A
	I_D（T_C=100℃）	78	A
Drain Current @ Current-Pulsed (Note 1)	I_{DM}（T_C=25℃）	300	A
Maximum Power Dissipation	P_D(T_C=25℃)	100	W
	P_D(T_C=100℃)	50	W
Drain Current @ Continuous	I_D（T_A=25℃）	25	A
	I_D（T_A=70℃）	20	A
Maximum Power Dissipation	P_D(T_A=25℃)	2.72	W
	P_D(T_A=70℃)	1.9	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)	$R_{\theta JA}$(t≤10s)	18	℃/W
	$R_{\theta JA}$(Steady State)	55	℃/W
Thermal Resistance,Junction-to-Case	$R_{\theta JC}$(Steady State)	1.5	℃/W

ELECTRICAL CHARACTERISTICS (T_A=25℃unless otherwise noted)

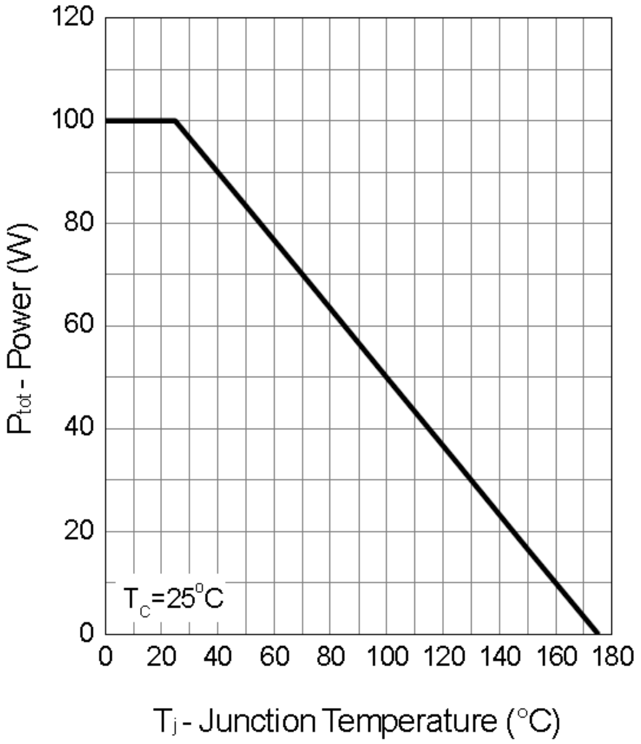
Parameter	Symbol	Condition	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V I_D=250µA	40	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=32V,V_{GS}=0V	-	-	1	µA
Gate-Body Leakage Current	I_{GSS}	V_{GS}=±20V,V_{DS}=0V	-	-	±100	nA
ON CHARACTERISTICS (Note 2)						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=VGS,I_D=250µA	1.4	1.7	2.5	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=4.5V, I_D=20A	-	3.1	4	mΩ
		V_{GS}=10V, I_D=25A	-	2.4	2.9	mΩ
		T_J=100° C	-	3.3	-	mΩ
DYNAMIC CHARACTERISTICS (Note4)						
Gate Resistance	R_G	V_{DS}=0V,V_{GS}=0V, F=1.0MHz	-	0.88	-	Ω
Input Capacitance	C_{iss}	V_{DS}=20V,V_{GS}=0V, F=1.0MHz	-	2650	-	PF
Output Capacitance	C_{oss}		-	750	-	PF
Reverse Transfer Capacitance	C_{rss}		-	88	-	PF
SWITCHING CHARACTERISTICS (Note 3)						
Turn-on Delay Time	$t_{d(on)}$	V_{DS}=20V, R_L=20Ω, V_{GEN}=10V,R_G=6Ω I_D=1A	-	17	-	nS
Turn-on Rise Time	t_r		-	11.5	-	nS
Turn-Off Delay Time	$t_{d(off)}$		-	36	-	nS
Turn-Off Fall Time	t_f		-	31	-	nS
Total Gate Charge	Q_g	V_{DS}=20V,I_D=25A,V_{GS}=4.5V	-	17	-	nC
Gate-Source Charge	Q_{gs}		-	7	-	nC
Gate-Drain Charge	Q_{gd}		-	5.3	-	nC
Body Diode Reverse Recovery Time	T_{rr}	I_F=5A, dI/dt=100A/µs	-	38	-	nS
Body Diode Reverse Recovery Charge	Q_{rr}		-	35	-	nC
DRAIN-SOURCE DIODE CHARACTERISTICS						
Diode Forward Voltage (Note 2)	V_{SD}	V_{GS}=0V,I_S=20A	-	0.8	1.1	V

NOTES:

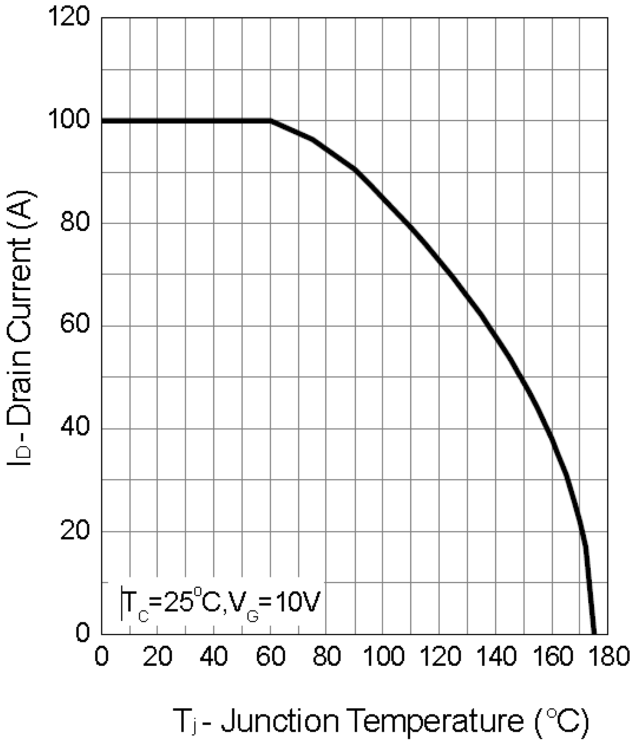
1. Pulse width limited by max. junction temperature.
2. Pulse Test: Pulse Width ≤ 300µs, Duty Cycle ≤ 2%.
3. Guaranteed by design, not subject to production testing

Typical Operating Characteristics

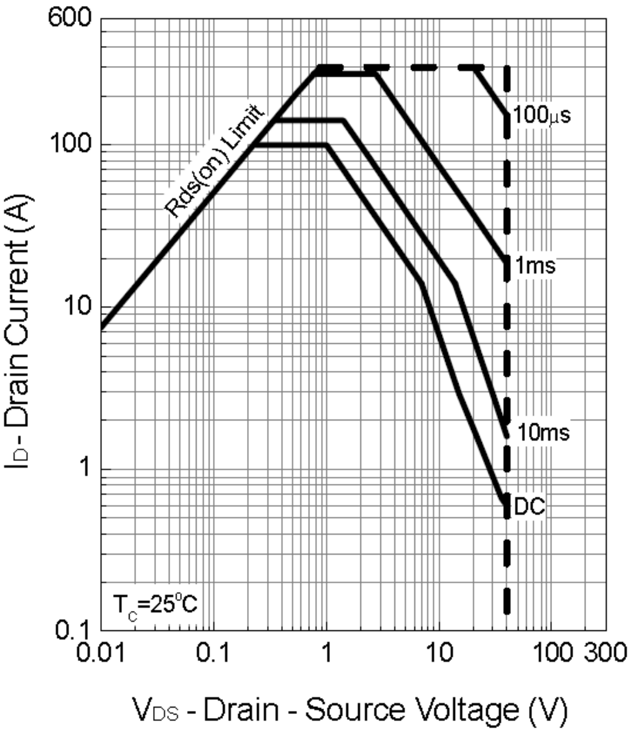
Power Dissipation



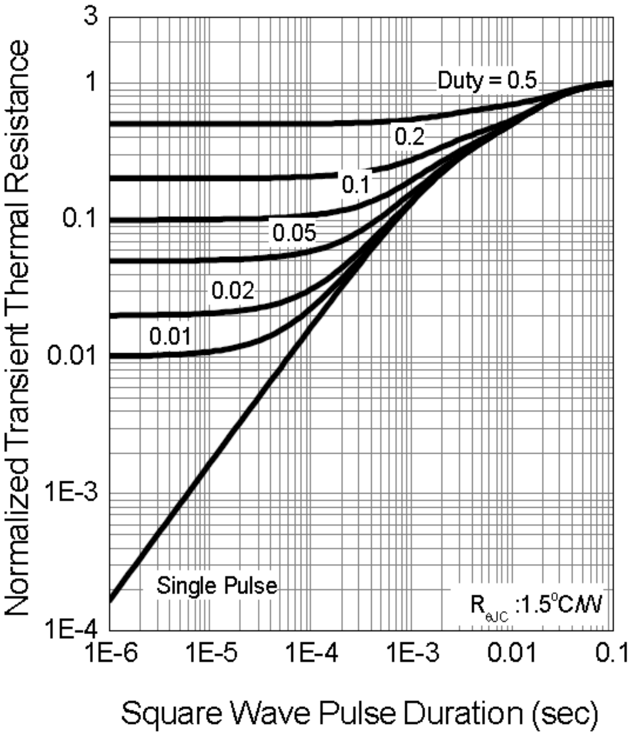
Drain Current



Safe Operation Area

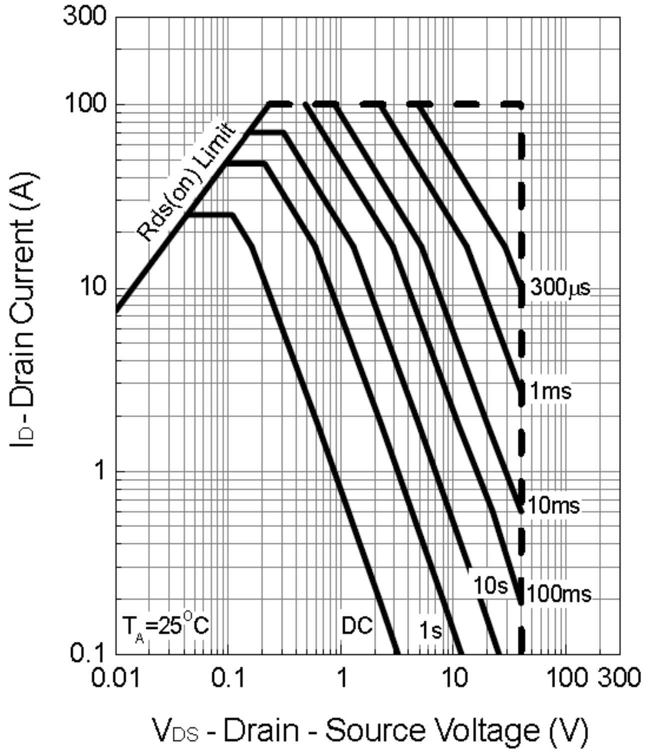


Thermal Transient Impedance

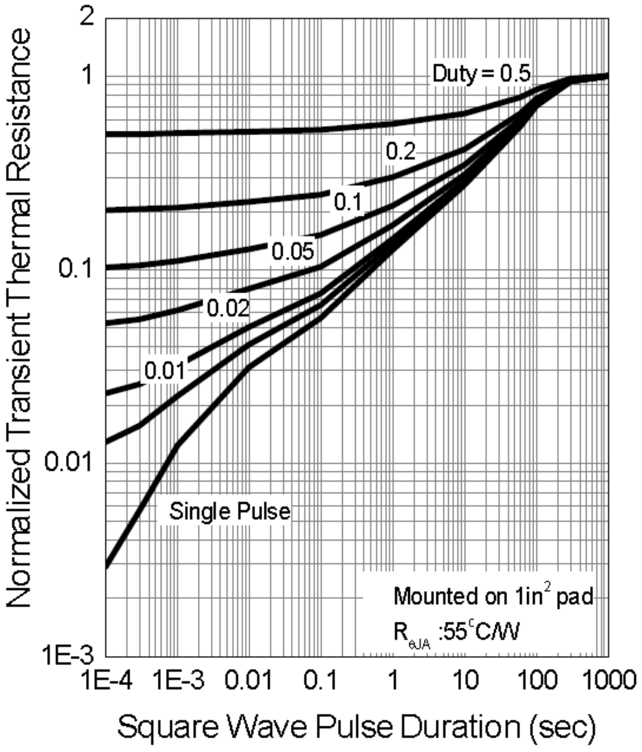


Typical Operating Characteristics(Cont.)

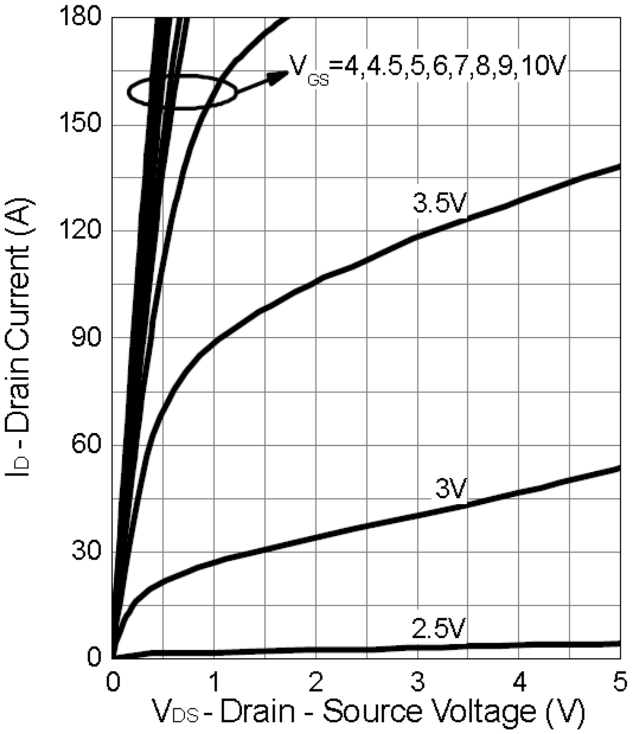
Safe Operation Area



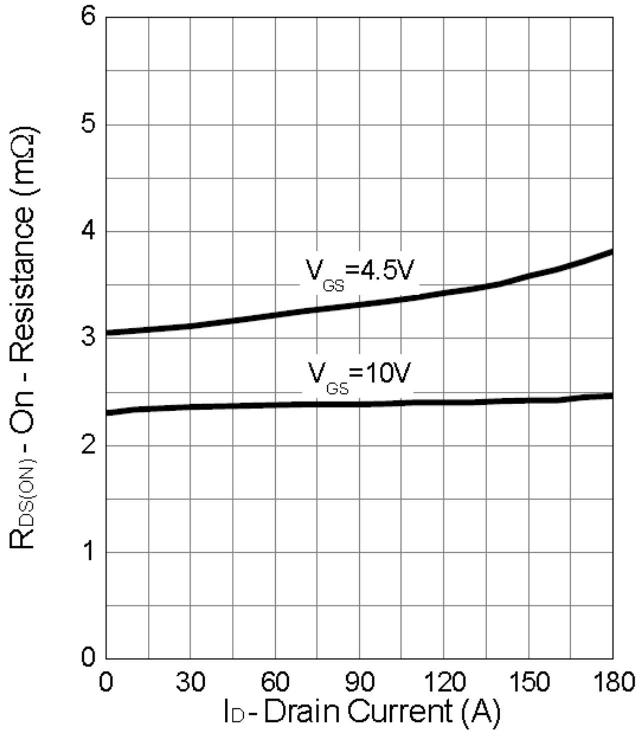
Thermal Transient Impedance



Output Characteristics

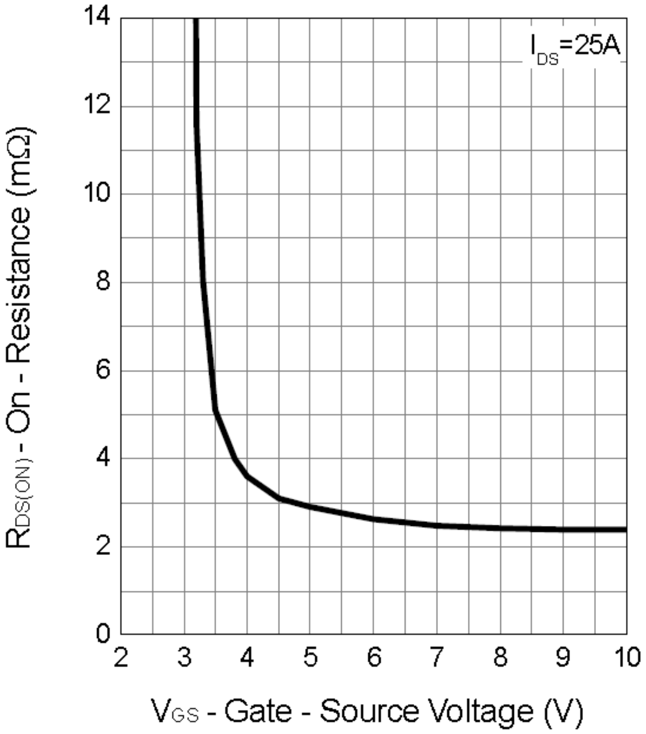


Drain-Source On Resistance

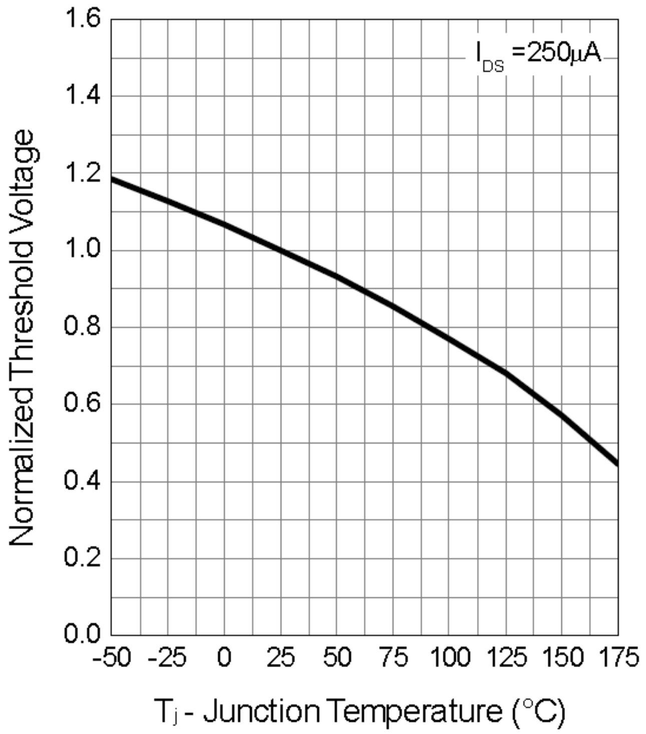


Typical Operating Characteristics (Cont.)

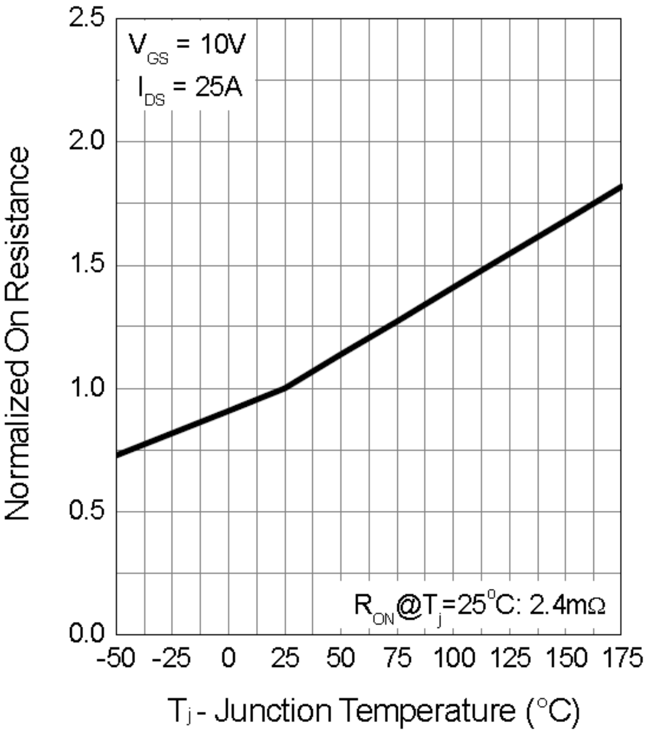
Gate-Source On Resistance



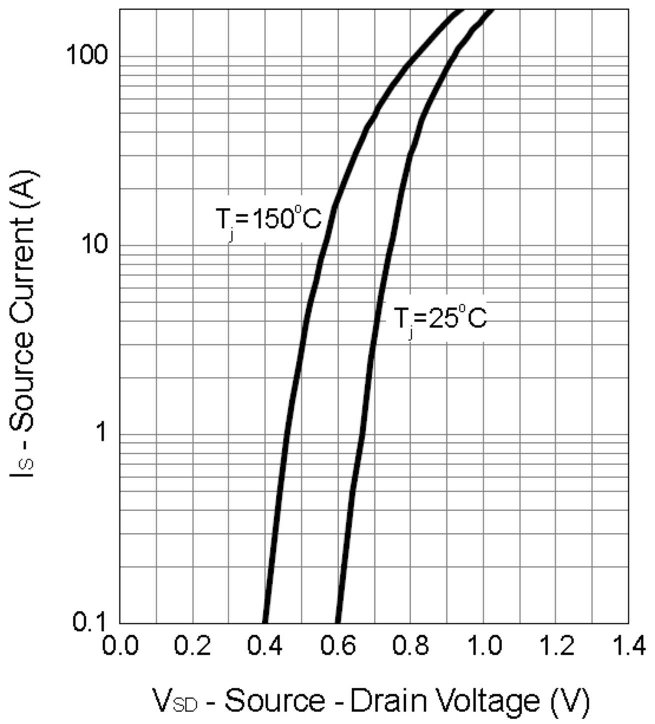
Gate Threshold Voltage



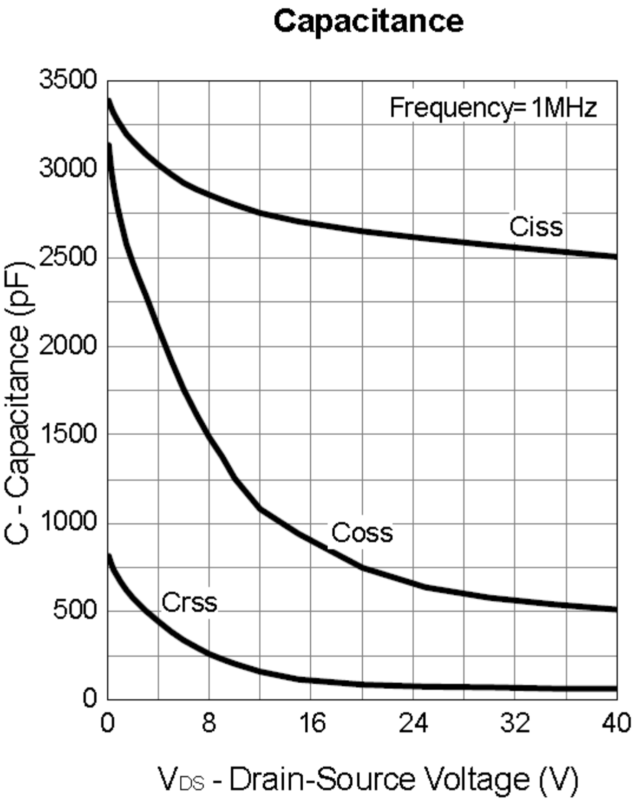
Drain-Source On Resistance

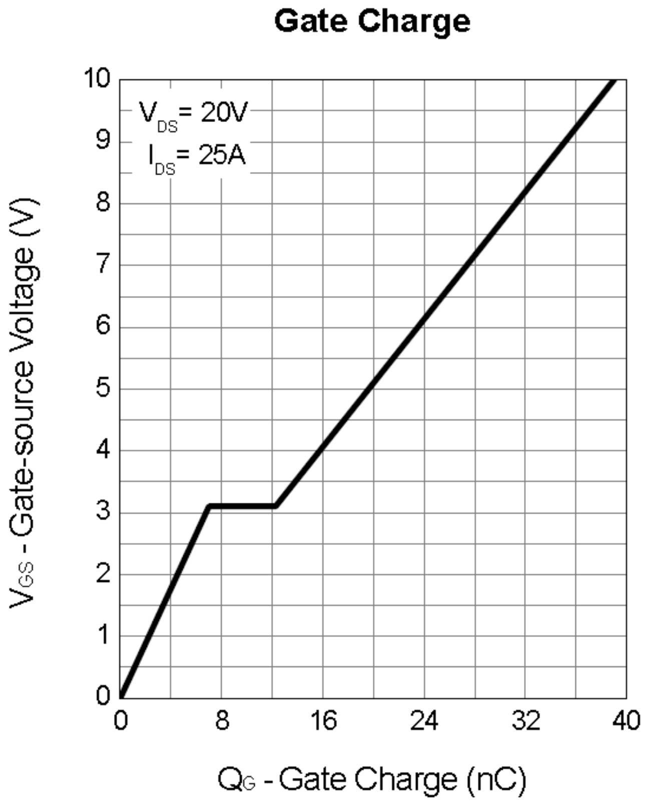


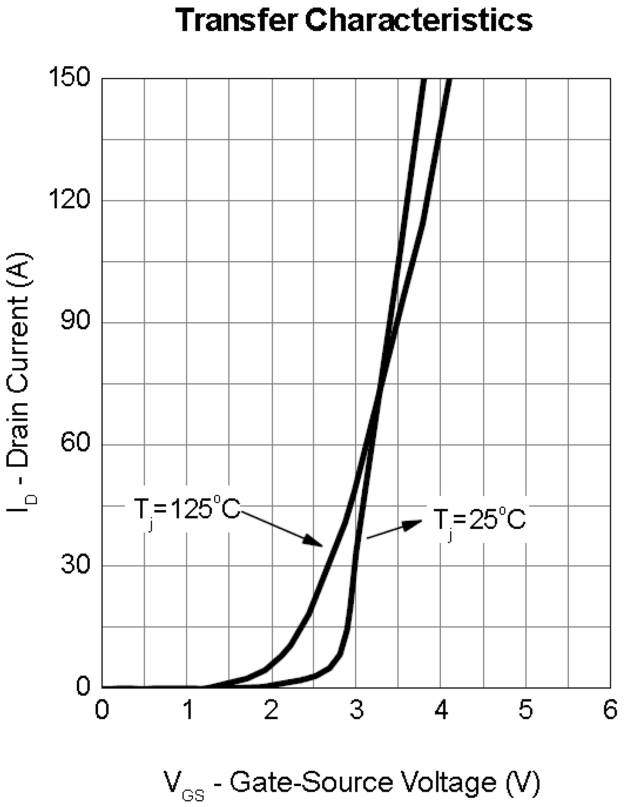
Source-Drain Diode Forward



Typical Operating Characteristics (Cont.)

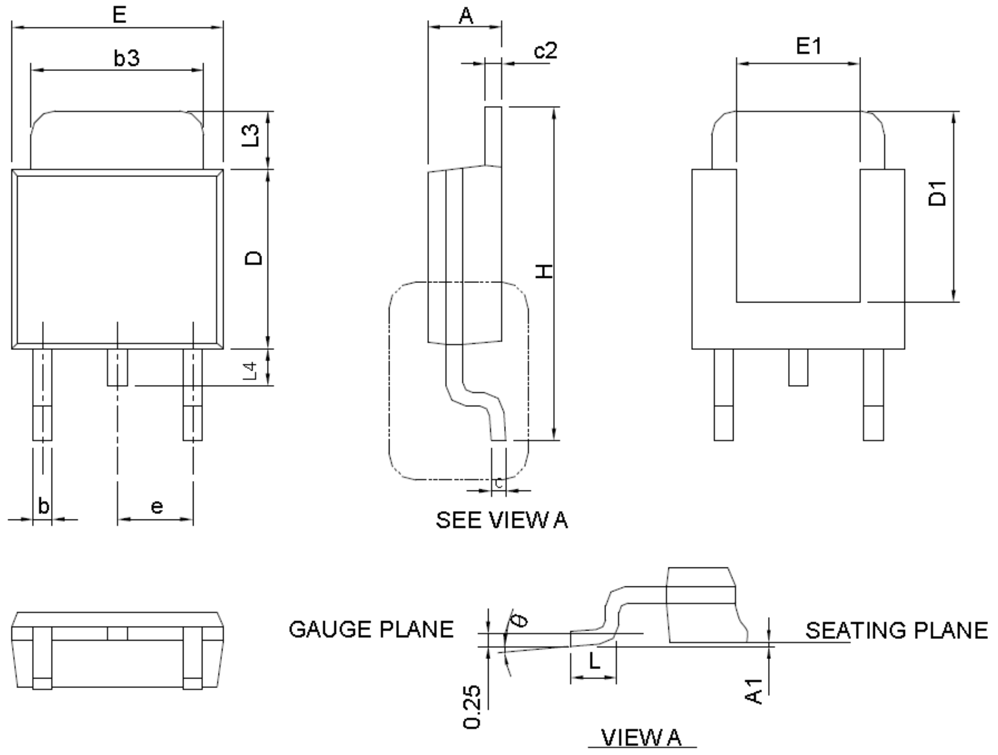






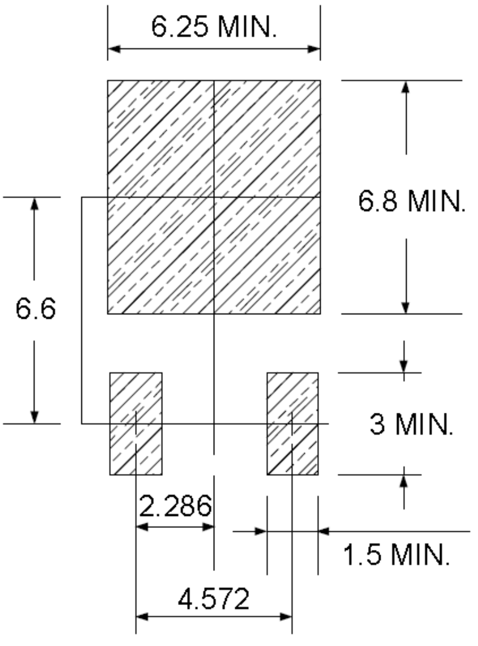
Package Information

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