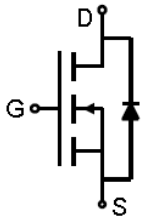
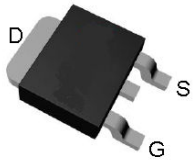
N-Channel Enhancement Mode MOSFET TDM3428

DESCRIPTION

The TDM3428 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.



Schematic diagram



Top View of TO-252-3

GENERAL FEATURES

- RDS(ON) < 9.8mΩ @ VGS=4.5V
  RDS(ON) < 7.2mΩ @ VGS=10V
- High Power and current handing capability
- Lead free product is acquired
- Surface Mount Package

Application

- PWM applications
- Load switch
- Power management

ABSOLUTE MAXIMUM RATINGS(T_A=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(Note 1)	I_D（25℃）	50	A
	I_D（100℃）	40	A
Drain Current @ Current-Pulsed (Note 1)	I_{DM}	125	A
Maximum Power Dissipation (T_A=25℃)	P_D	50	W
Operating Junction and Storage Temperature Range	T_J,T_{STG}	-55 To 150	℃

THERMAL CHARACTERISTICS

Thermal Resistance,Junction-to-Ambient (Note 2)	$R_{\theta JA}$	20	℃/W

ELECTRICAL CHARACTERISTICS (T_A=25℃unless otherwise noted)

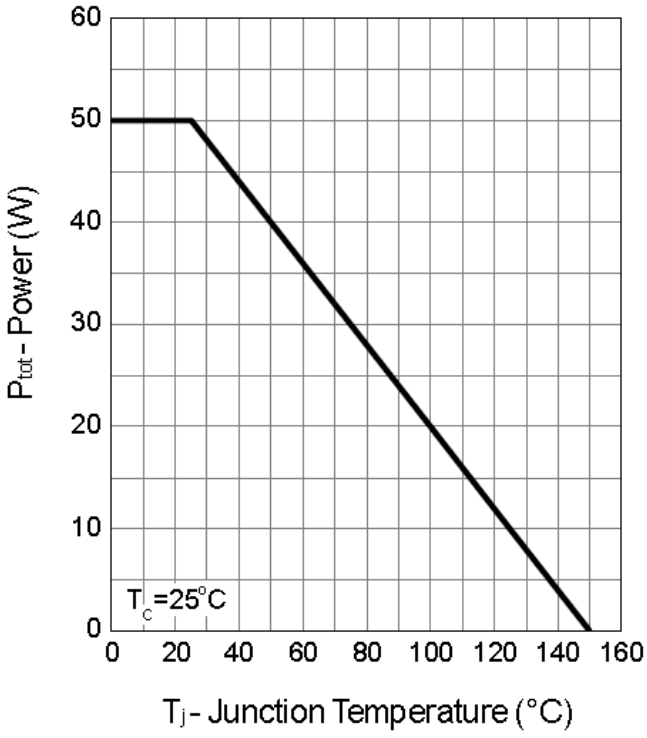
Parameter	Symbol	Condition	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V I_D=250μA	30			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=24V,V_{GS}=0V			1	μA
Gate-Body Leakage Current	I_{GSS}	V_{GS}=±20V,V_{DS}=0V			±100	nA
ON CHARACTERISTICS (Note 3)						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=VGS,I_D=250μA	1.5	1.8	2.5	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=4.5V, I_D=15A		7.6	9.8	mΩ
		V_{GS}=10V, I_D=30A		5.9	7.2	mΩ
DYNAMIC CHARACTERISTICS (Note4)						
Input Capacitance	C_{iss}	V_{DS}=15V,V_{GS}=0V, F=1.0MHz	980	1180	1400	PF
Output Capacitance	C_{oss}		158	190	228	PF
Reverse Transfer Capacitance	C_{rss}		90	115	140	PF
SWITCHING CHARACTERISTICS (Note 4)						
Turn-on Delay Time	$t_{d(on)}$	V_{DS}=15V, RL=15Ω, V_{GS}=10V,R_{GEN}=6Ω		11	20	nS
Turn-on Rise Time	t_r	ID=1A		12	22	nS
Turn-Off Delay Time	$t_{d(off)}$			36	60	nS
Turn-Off Fall Time	t_f			10	19	nS
Total Gate Charge	Q_g	V_{DS}=15V,I_D=30A,V_{GS}=10V		20	24	nC
Gate-Source Charge	Q_{gs}			2.2	2.7	nC
Gate-Drain Charge	Q_{gd}			3.5	4.1	nC
Body Diode Reverse Recovery Time	T_{rr}	I_F=5A, dI/dt=100A/μs		20		nS
Body Diode Reverse Recovery Charge	Q_{rr}			10		nC
DRAIN-SOURCE DIODE CHARACTERISTICS						
Diode Forward Voltage (Note 3)	V_{SD}	V_{GS}=0V,I_S=15A		0.85	1.1	V

NOTES:

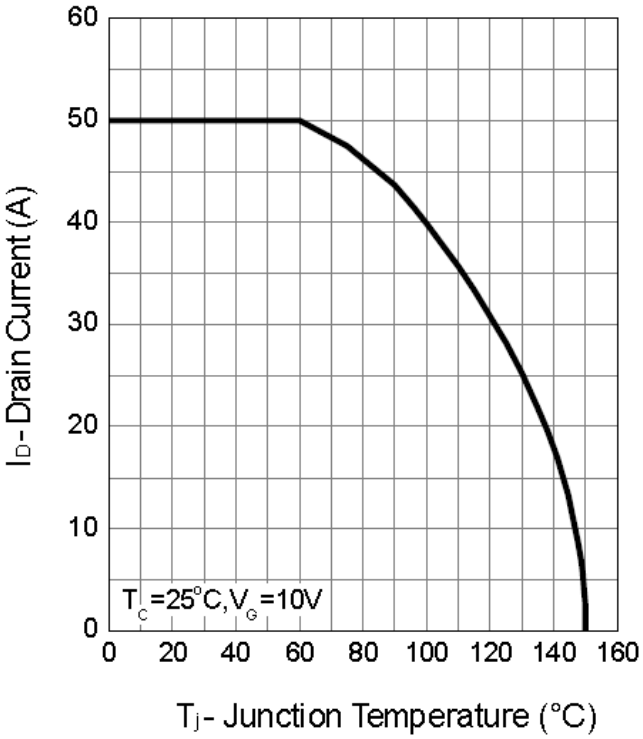
1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on 1in2 FR4 Board, t ≤ 10 sec.
3. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
4. Guaranteed by design, not subject to production testing

Typical Operating Characteristics

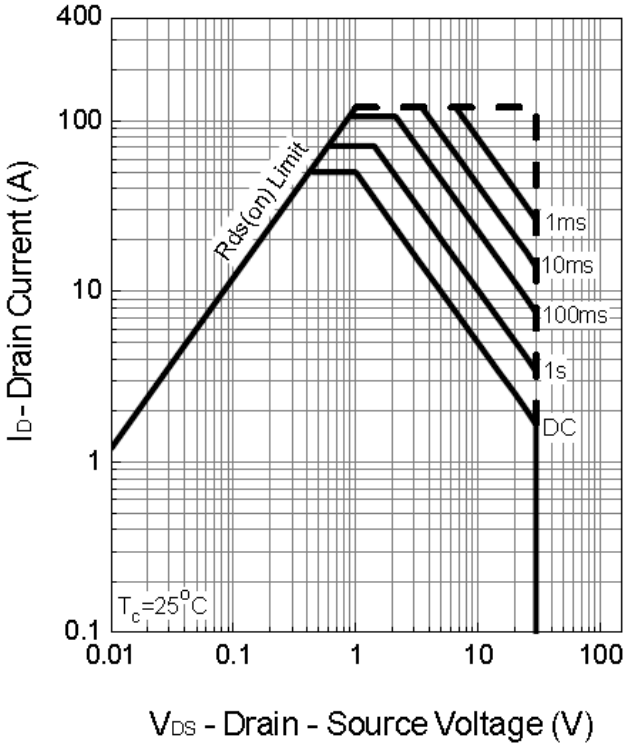
Power Dissipation



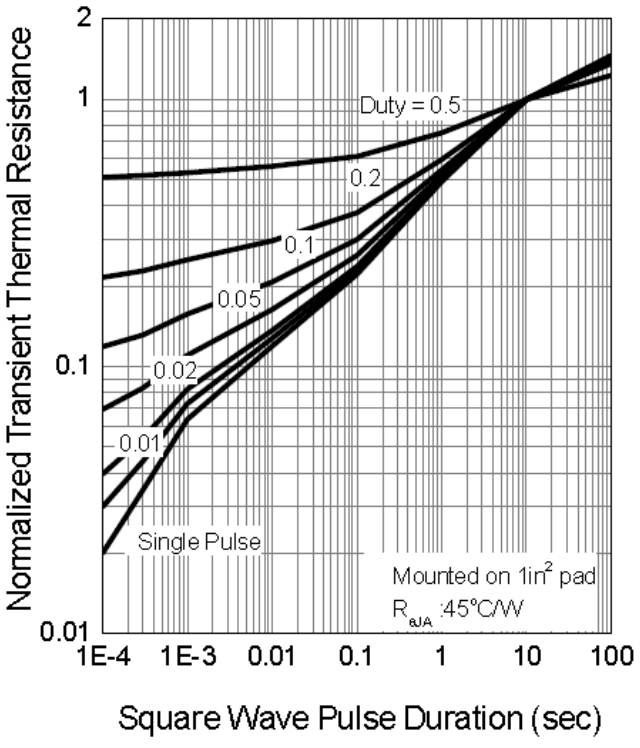
Drain Current



Safe Operation Area

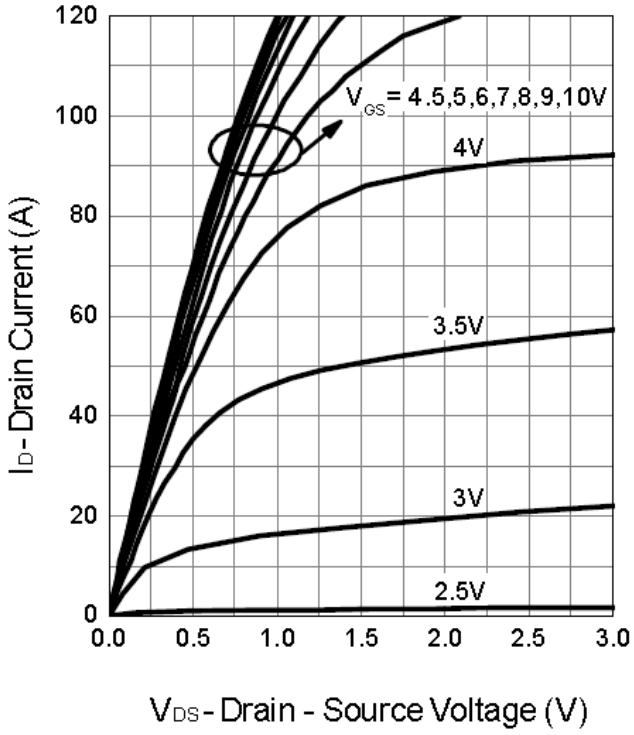


Thermal Transient Impedance

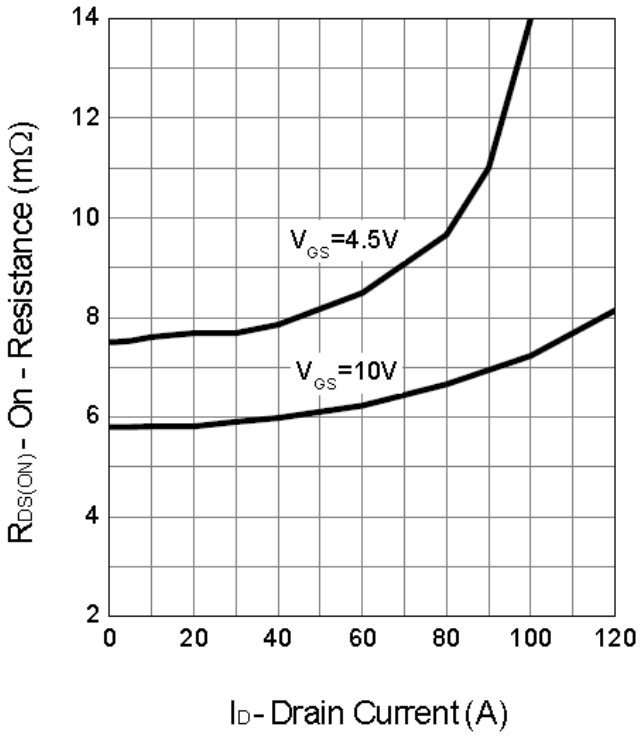


Typical Operating Characteristics(Cont.)

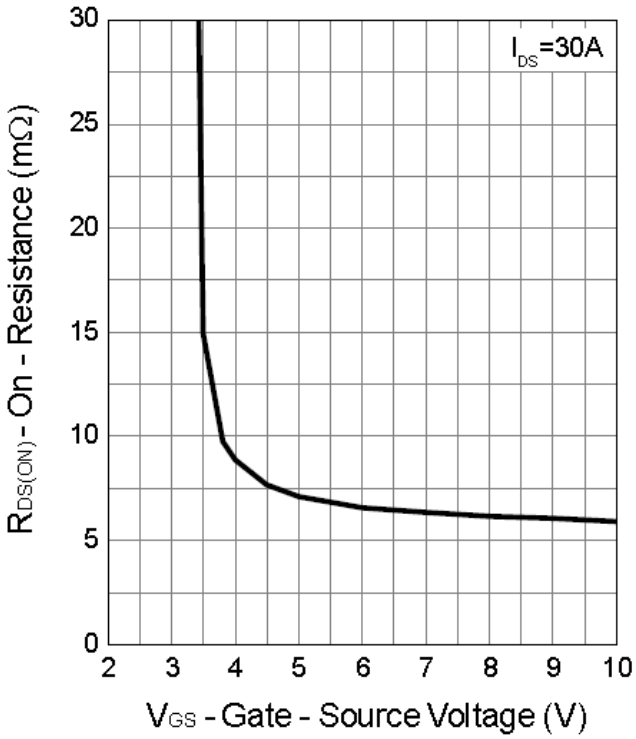
Output Characteristics



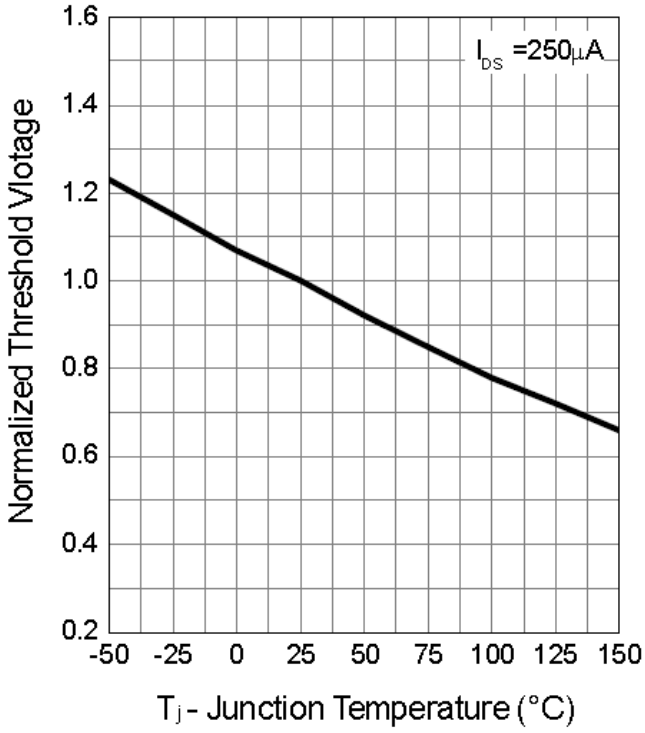
Drain-Source On Resistance



Gate-Source On Resistance

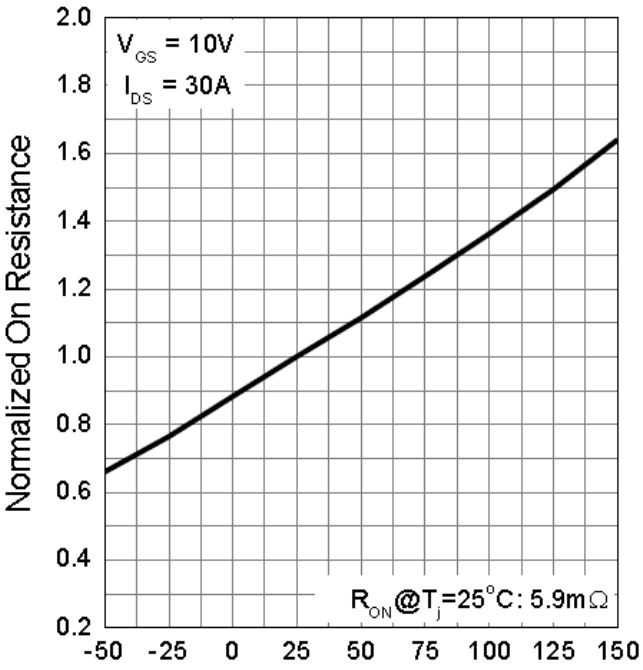


Gate Threshold Voltage

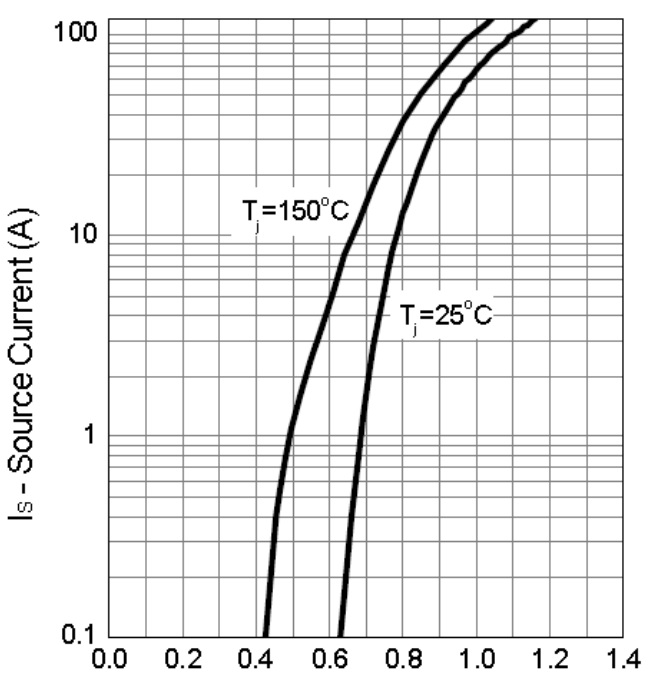


Typical Operating Characteristics (Cont.)

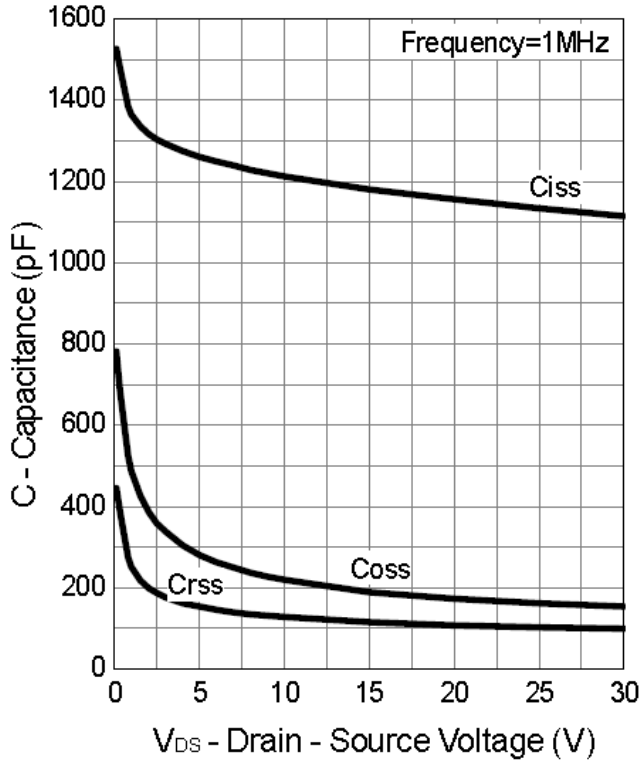
Drain-Source On Resistance



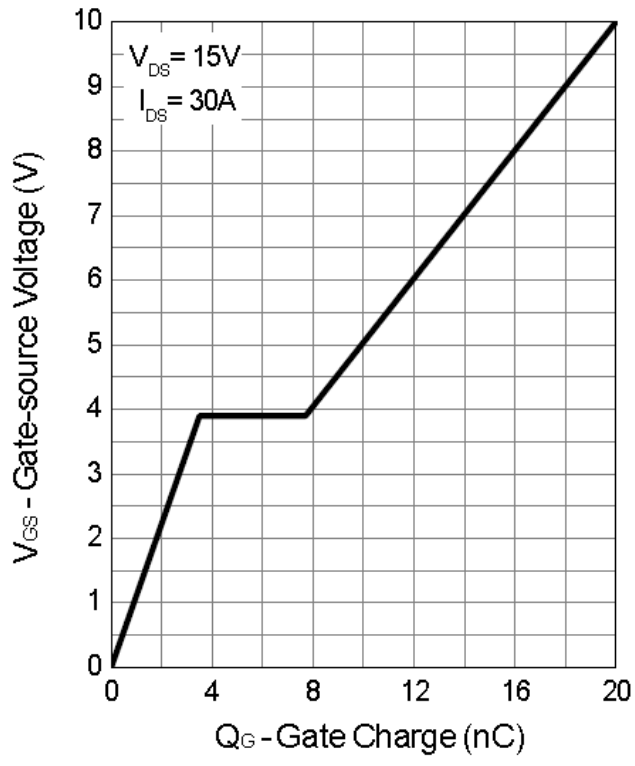
Source-Drain Diode Forward



Capacitance



Gate Charge



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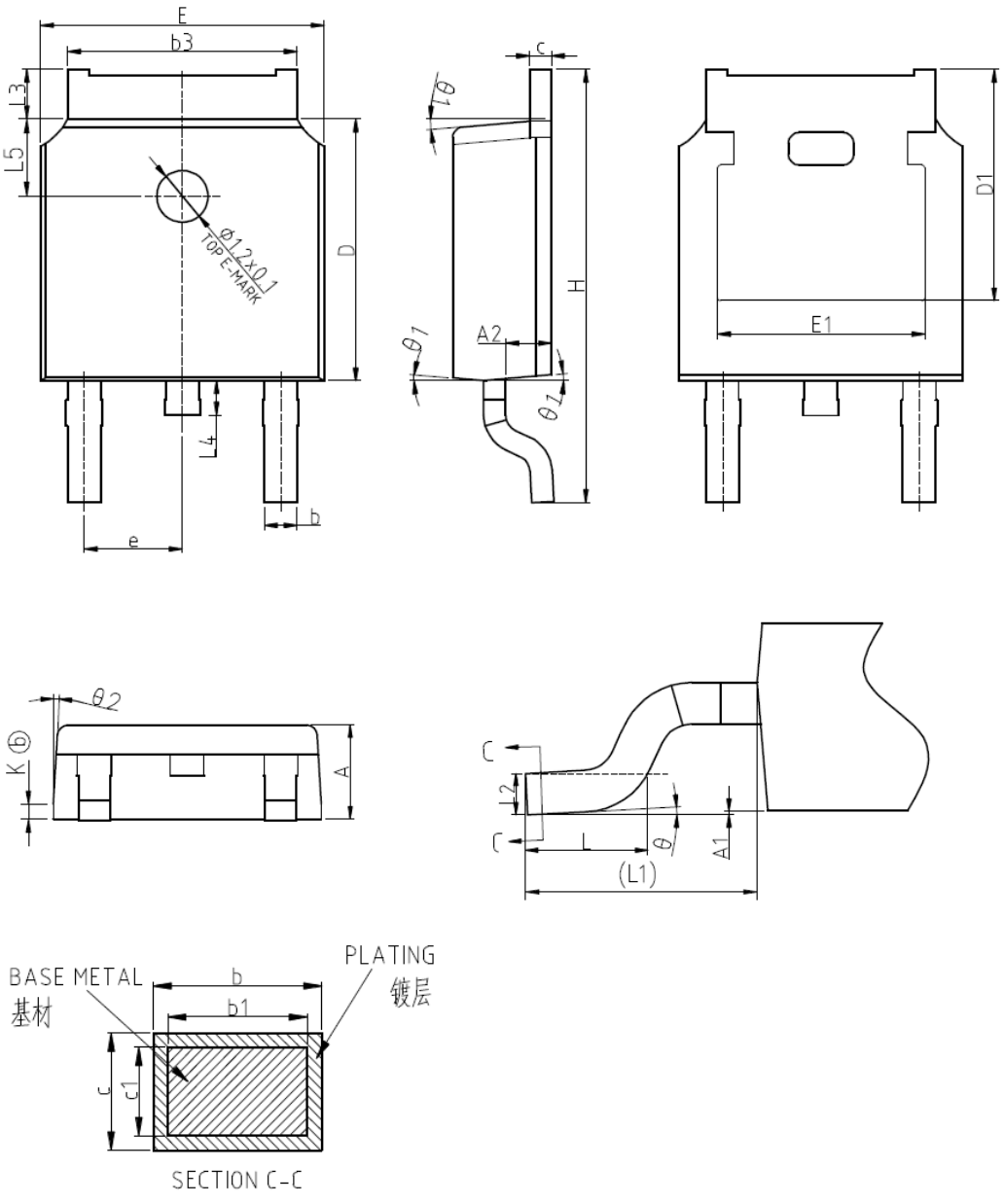
Package Information

TO252-3 Package



SYMBOL	mm		
	MIN	NOM	MAX
A	2.20	2.30	2.40
A1	0.00	-	0.20
A2	0.97	1.07	1.17
b	0.68	0.78	0.90
b1	0.66	0.76	0.88
b3	5.20	5.33	5.50
c	0.43	0.53	0.63
c1	0.41	0.51	0.61
D	5.98	6.10	6.22
D1	5.30REF		
E	6.40	6.60	6.80
E1	4.63	4.83	5.03
e	2.286BSC		
H	9.40	10.10	10.50
L	1.38	1.50	1.75
L1	2.90REF		
L2	0.51BSC		
L3	0.88	-	1.28
L4	-	-	1.00
L5	1.65	1.80	1.95
θ	0°	-	8°
θ1	5°	7°	9°
θ2	5°	7°	9°
K	0.40REF		

Design Notes