

General Features

- High density cell design for ultra low R_{ds(on)}
- Fully characterized avalanche voltage and current
- Good stability and uniformity with high E_{AS}
- Excellent package for good heat dissipation

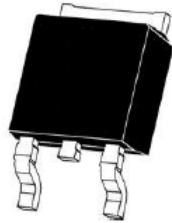
Application

- High side switch for full bridge converter
- DC/DC converter for LCD display

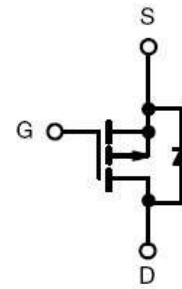


Product Summary

BVDSS	-60	V
RDS(on),Typ.@VGS=-10V	30	mΩ
ID	-25	A



TO-252-2L top view



Schematic diagram

Absolute Maximum Ratings (T_C=25°C unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V _{DS}	-60	V
Gate-Source Voltage	V _{GS}	±20	V
Drain Current-Continuous	I _D	-25	A
Drain Current-Continuous(T _C =100°C)	I _D (100°C)	-12.7	A
Pulsed Drain Current	I _{DM}	-72	A
Maximum Power Dissipation	P _D	60	W
Derating factor		0.4	W/°C
Single pulse avalanche energy ^(Note 5)	E _{AS}	50	mJ
Operating Junction and Storage Temperature Range	T _J , T _{STG}	-55 To 175	°C

Thermal Characteristics

Parameter	Symbol	Limit	Units
Thermal Resistance, Junction-to-Case	R _{θJC}	2.5	°C/W
Thermal Resistance, Junction-to-Ambient	R _{θJA}	50	°C/W

Electrical Characteristics (T_c=25°C unless otherwise noted)

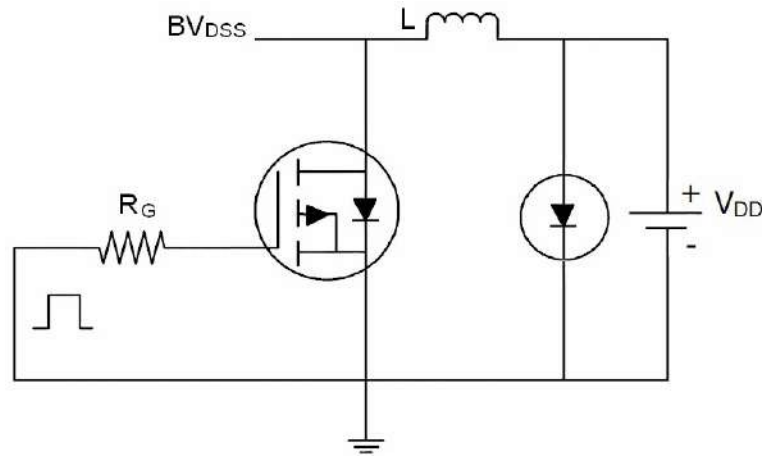
Parameter	Symbol	Condition	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _D =-250μA	-60	-	-	V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =-60V, V _{GS} =0V	-	-	-1	μA
Gate-Body Leakage Current	I _{GSS}	V _{GS} =±20V, V _{DS} =0V	-	-	±100	nA
On Characteristics (Note 3)						
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =-250μA	-1	-1.7	-2.2	V
Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} =-10V, I _D =-5 A	-	30	40	mΩ
		V _{GS} =-4.5V, I _D =-5 A	-	37	46	mΩ
Forward Transconductance	g _{FS}	V _{DS} =-5V, I _D =-12A	-	10	-	S
Dynamic Characteristics (Note4)						
Input Capacitance	C _{ISS}	V _{DS} =-30V, V _{GS} =0V, F=1.0MHz	-	1981	-	PF
Output Capacitance	C _{OSS}		-	109	-	PF
Reverse Transfer Capacitance	C _{RSS}		-	92	-	PF
Switching Characteristics (Note 4)						
Turn-on Delay Time	t _{d(on)}	V _{DD} =-30V, R _L =1.5Ω, V _{GS} =-10V, R _G =3Ω	-	11	-	nS
Turn-on Rise Time	t _r		-	14	-	nS
Turn-Off Delay Time	t _{d(off)}		-	33	-	nS
Turn-Off Fall Time	t _f		-	13	-	nS
Total Gate Charge	Q _g	V _{DS} =-30, I _D =-12A, V _{GS} =-10V	-	37.6	-	nC
Gate-Source Charge	Q _{gs}		-	4.3	-	nC
Gate-Drain Charge	Q _{gd}		-	7.2	-	nC
Drain-Source Diode Characteristics						
Diode Forward Voltage (Note 3)	V _{SD}	V _{GS} =0V, I _S =-12A	-	-0.8	-1.2	V
Diode Forward Current (Note 2)	I _S		-	-	-25	A
Reverse Recovery Time	t _{rr}	T _J = 25°C, I _F = -12A di/dt = -100A/μs (Note3)	-	35	-	nS
Reverse Recovery Charge	Q _{rr}		-	38	-	nC
Forward Turn-On Time	t _{on}	Intrinsic turn-on time is negligible (turn-on is dominated by LS+LD)				

Notes:

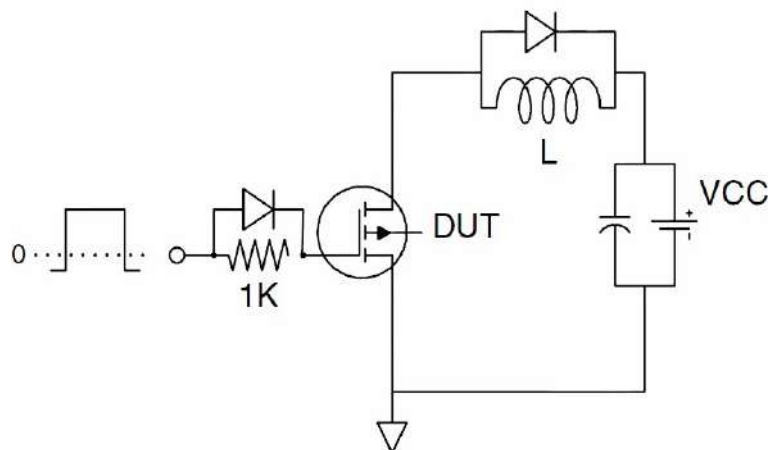
1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, t ≤ 10 sec.
3. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
4. Guaranteed by design, not subject to production
5. E_{AS} condition: T_j=25°C, V_{DD}=-30V, V_G=-10V, L=0.5mH, R_G=25Ω

Test Circuit

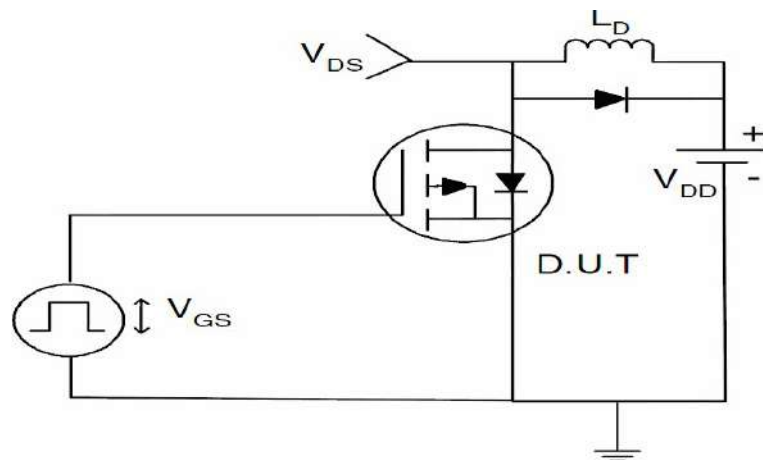
1) E_{AS} Test Circuit



2) Gate Charge Test Circuit



3) Switch Time Test Circuit



Typical Electrical and Thermal Characteristics (Curves)

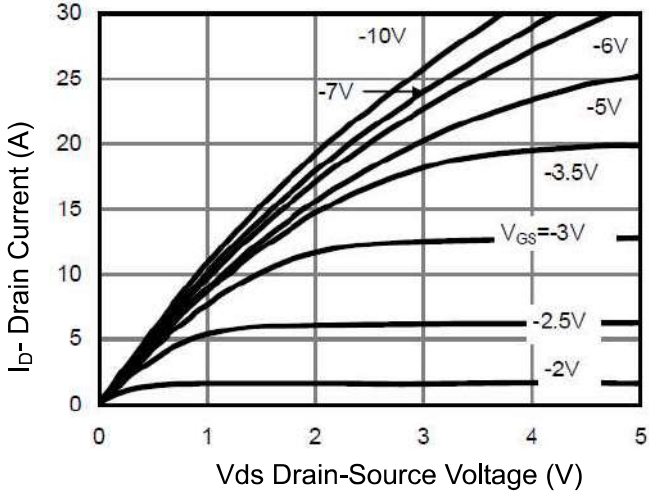


Figure 1 Output Characteristics

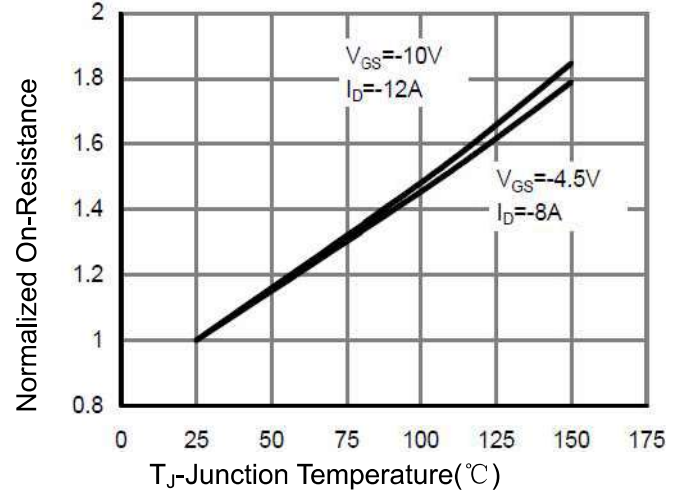


Figure 4 Rdson-Junction Temperature

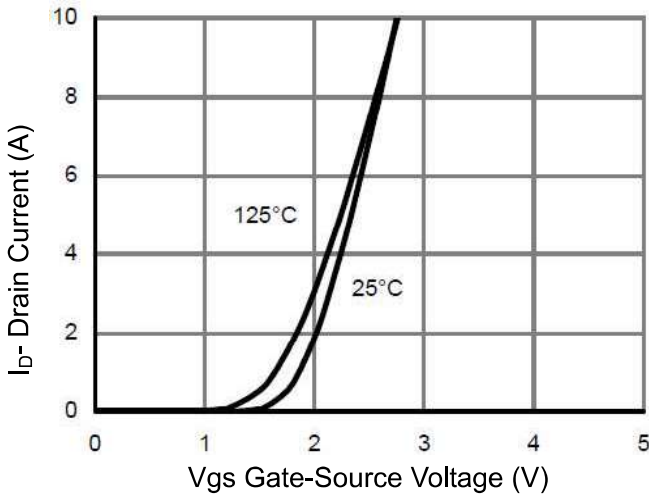


Figure 2 Transfer Characteristics

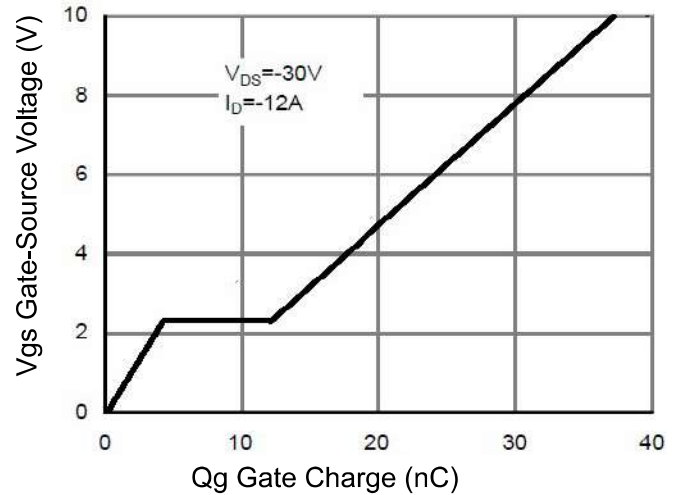


Figure 5 Gate Charge

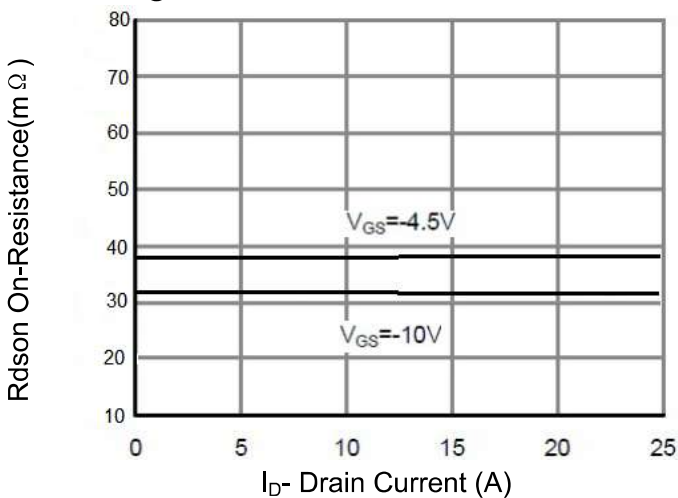


Figure 3 Rdson- Drain Current

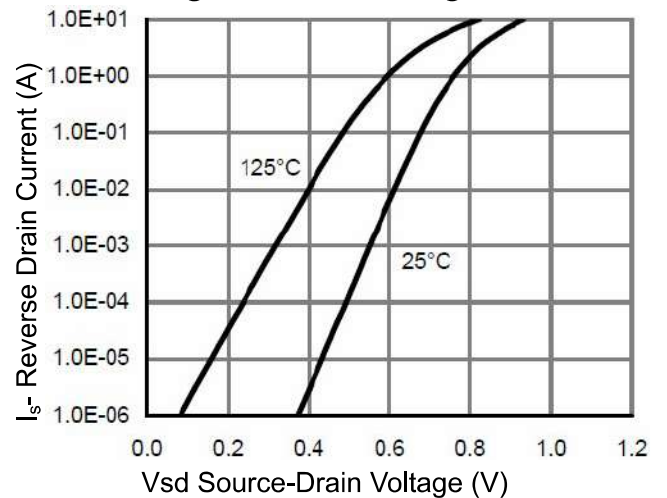


Figure 6 Source- Drain Diode Forward

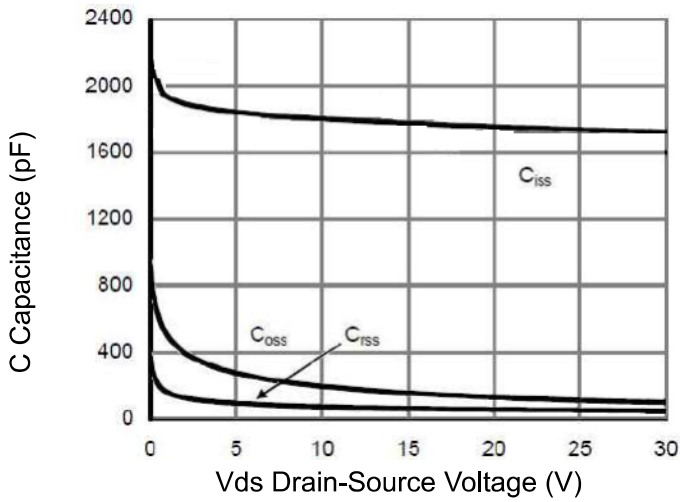


Figure 7 Capacitance vs Vds

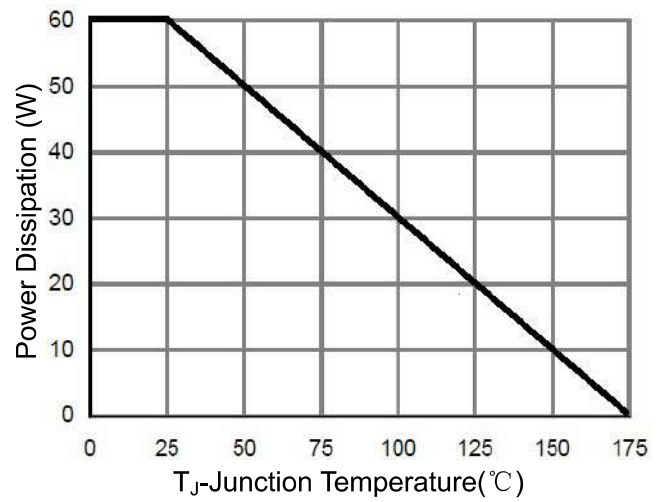


Figure 9 Power De-rating

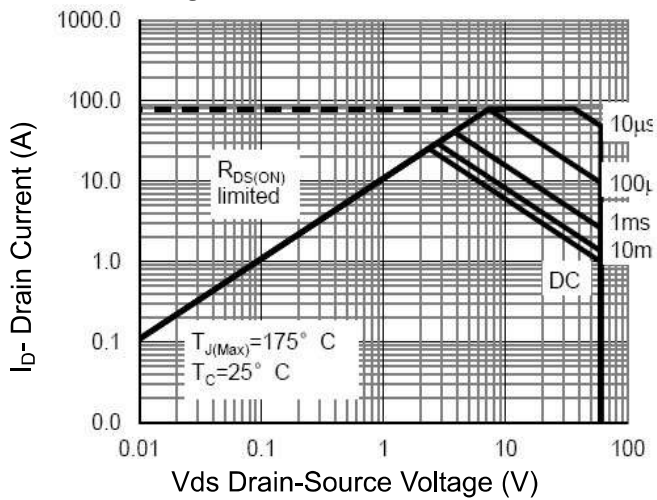


Figure 8 Safe Operation Area

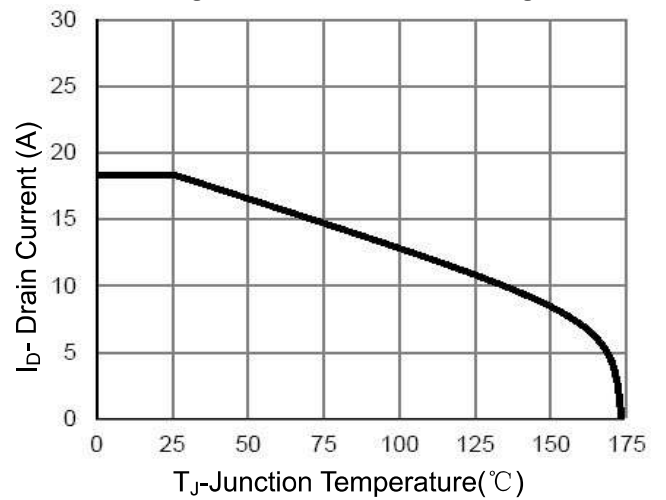


Figure 10 ID Current De-rating

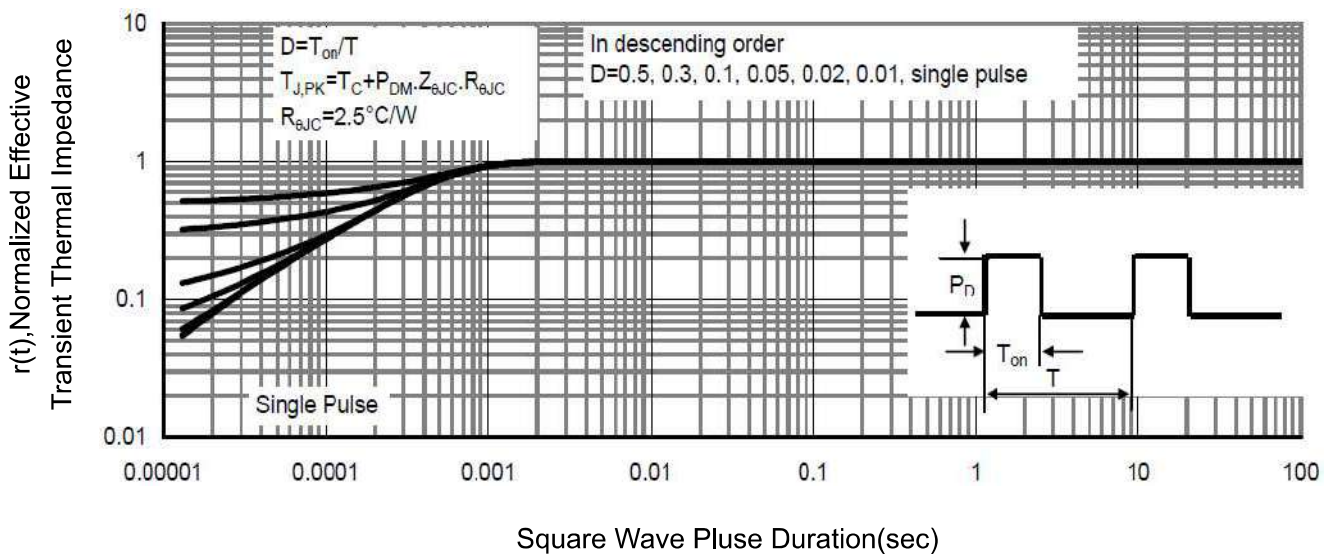
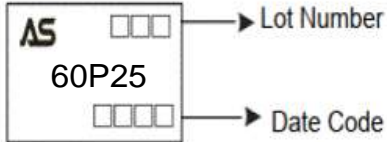


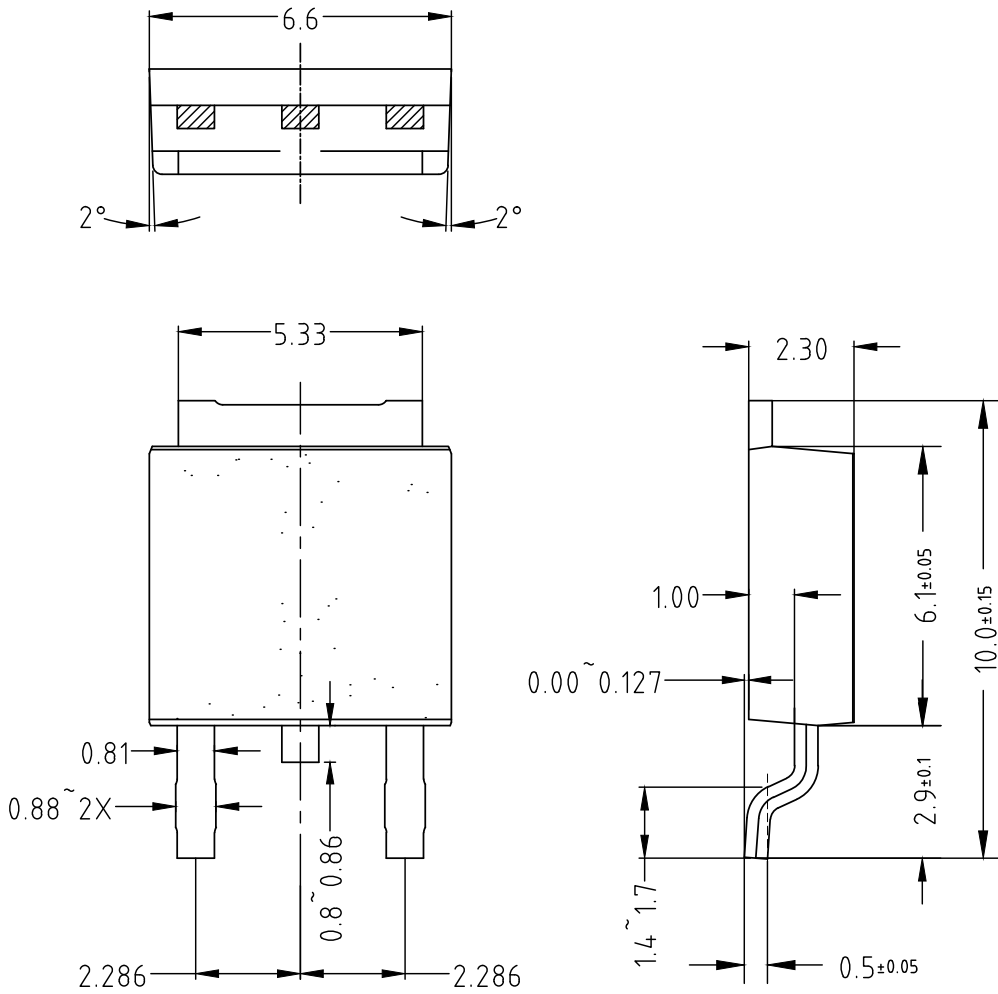
Figure 11 Normalized Maximum Transient Thermal Impedance

Ordering and Marking Information

Ordering Device No.	Marking	Package	Packing	Quantity
ASDM60P25KQ-R	60P25	TO-252	Tape&Reel	2500/Reel

PACKAGE	MARKING
TO-252	 <p>AS □□□ → Lot Number 60P25 □□□□ → Date Code</p>

TO-252



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