

60V, 11A, 90mΩ N-Channel Power MOSFET

FEATURES

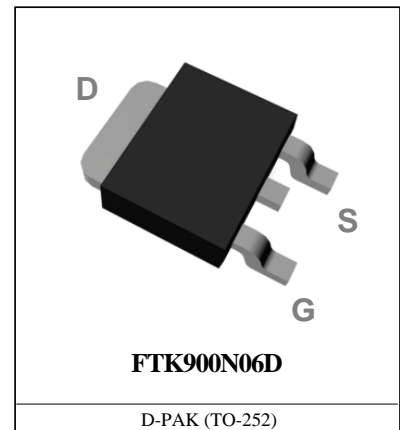
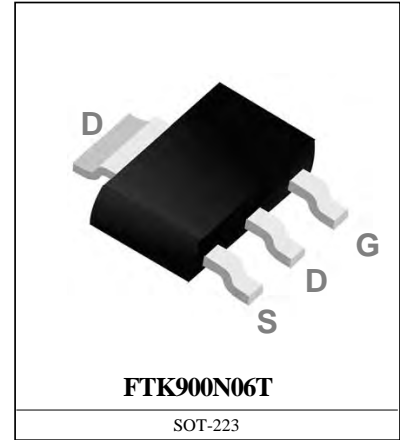
- 100% UIS and Rg tested
- Logic-level gate drive
- Fast switching
- RoHS Compliant
- Halogen-Free according to IEC 61249-2-21

APPLICATIONS

- DC-DC Converters
- Solenoid and Motor Drivers

PRODUCT SUMMARY			
PARAMETER		VALUE	UNIT
V_{DS}		60	V
$R_{DS(on)}$ (max)	$V_{GS} = 10V$	110	mΩ
	$V_{GS} = 4.5V$	130	
Q_g	$V_{GS} = 10V$	11	nC

Note: MSL 3 (Moisture Sensitivity Level) per J-STD-020



ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ C$ unless otherwise noted)					
PARAMETER		SYMBOL	LIMIT	UNIT	
Drain-Source Voltage		V_{DS}	60	V	
Gate-Source Voltage		V_{GS}	± 20	V	
Continuous Drain Current (Note 1)	$T_C = 25^\circ C$	I_D	22	A	
	$T_C = 100^\circ C$		7		
Pulsed Drain Current (Note 2)		I_{DM}	44	A	
Single Pulse Avalanche Current (Note 3)		I_{AS}	7	A	
Single Pulse Avalanche Energy (Note 3)		E_{AS}	25	mJ	
Total Power Dissipation	$T_C = 25^\circ C$	P_D	SOT-223	7.8	W
			TO-252	20	W
Operating Junction and Storage Temperature Range		T_J, T_{STG}	- 55 to +150	$^\circ C$	

THERMAL RESISTANCE				
PARAMETER		SYMBOL	MAXIMUM	UNIT
Thermal Resistance – Junction to Case	SOT-223	$R_{\theta JC}$	16	$^\circ C/W$
	TO-252	$R_{\theta JC}$	6	$^\circ C/W$
Thermal Resistance – Junction to Ambient	SOT-223	$R_{\theta JA}$	70	$^\circ C/W$
	TO-252	$R_{\theta JC}$	62	$^\circ C/W$

Note: $R_{\theta JA}$ is the sum of the junction-to-case and case-to-ambient thermal resistances. The case-thermal reference is defined at the solder mounting surface of the drain pins. $R_{\theta JC}$ is guaranteed by design while $R_{\theta CA}$ is determined by the user's board design.



FTK900N06T/D

ELECTRICAL CHARACTERISTICS (T _A = 25°C unless otherwise noted)						
PARAMETER	CONDITIONS	SYMBOL	MIN	TYP	MAX	UNIT
Static						
Drain-Source Breakdown Voltage	V _{GS} = 0V, I _D = 250μA	BV _{DSS}	60	--	--	V
Gate Threshold Voltage	V _{GS} = V _{DS} , I _D = 250μA	V _{GS(TH)}	0.8	1.4	2.5	V
Gate-Source Leakage Current	V _{GS} = ±20V, V _{DS} = 0V	I _{GSS}	--	--	±100	nA
Drain-Source Leakage Current	V _{GS} = 0V, V _{DS} = 60V	I _{DSS}	--	--	1	μA
	V _{GS} = 0V, V _{DS} = 48V T _J = 125°C		--	--	10	
Drain-Source On-State Resistance (Note 4)	V _{GS} = 10V, I _D = 3A	R _{DS(on)}	--	90	110	mΩ
	V _{GS} = 4.5V, I _D = 1.5A		--	110	130	
Dynamic						
Total Gate Charge	V _{GS} = 10V, V _{DS} = 30V, I _D = 3A	Q _g	--	11	--	nC
Gate-Source Charge		Q _{gs}	--	1.4	--	
Gate-Drain Charge		Q _{gd}	--	1.8	--	
Input Capacitance	V _{GS} = 0V, V _{DS} = 30V, f = 1.0MHz	C _{iss}	--	525	--	pF
Output Capacitance		C _{oss}	--	30	--	
Reverse Transfer Capacitance		C _{rss}	--	24	--	
Gate Resistance	f = 1.0MHz	R _g	--	1.7	--	Ω
Switching (Note 5)						
Turn-On Delay Time	V _{GS} = 10V, V _{DS} = 30V, I _D = 3A, R _G = 1.5Ω	t _{d(on)}	--	6.5	--	ns
Rise Time		t _r	--	12	--	
Turn-Off Delay Time		t _{d(off)}	--	16	--	
Fall Time		t _f	--	1.8	--	
Source-Drain Diode						
Diode Forward Voltage (Note 4)	V _{GS} = 0V, I _S = 3A	V _{SD}	--	--	1.2	V
Reverse Recovery Time	I _S = 3A, V _{GS} = 30V di/dt = 100A/μS	t _{rr}	--	14	--	ns
Reverse Recovery Charge		Q _{rr}	--	10	--	nC

Notes:

- Limited by maximum junction temperature.
- Pulsed width limited by maximum junction temperature.
- L = 1mH, V_{GS} = 10V, R_G = 25Ω, Starting T_J = 25°C.
- Pulse test: Pulse Width ≤ 300μs, duty cycle ≤ 2%.
- Switching time is essentially independent of operating temperature.

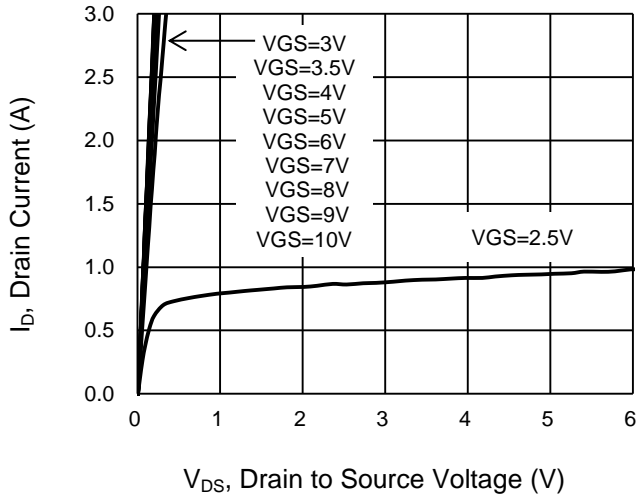
ORDERING INFORMATION

ORDERING CODE	PACKAGE	PACKING
FTK900N06T	SOT-223	4.0kpcs / 13" Reel
FTK900N06D	TO-252	2.5kpcs / 13" Reel

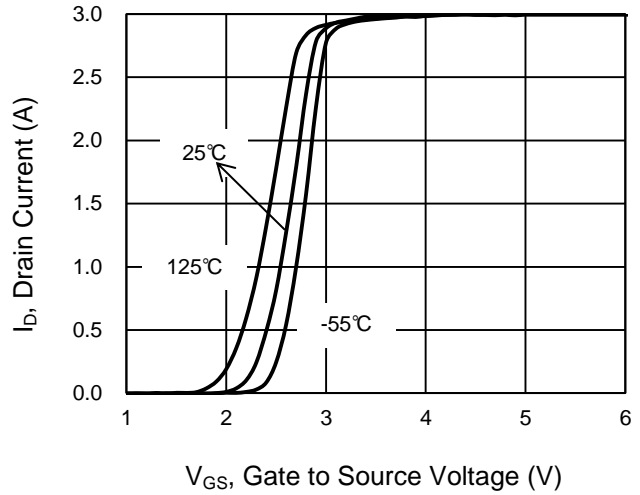
CHARACTERISTICS CURVES

($T_A = 25^\circ\text{C}$ unless otherwise noted)

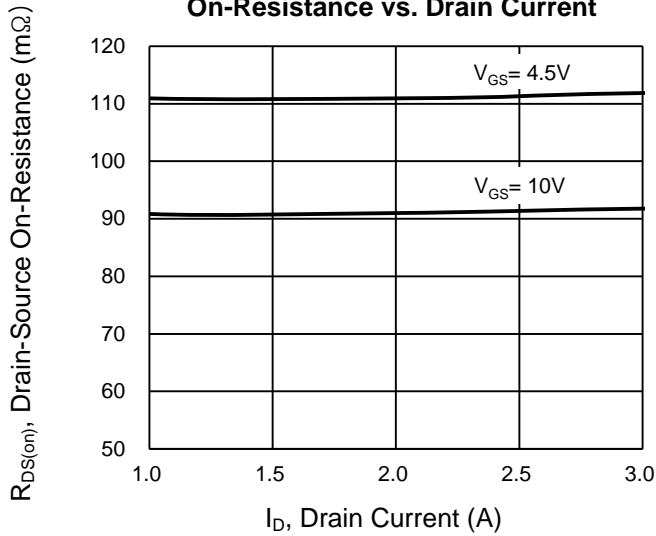
Output Characteristics



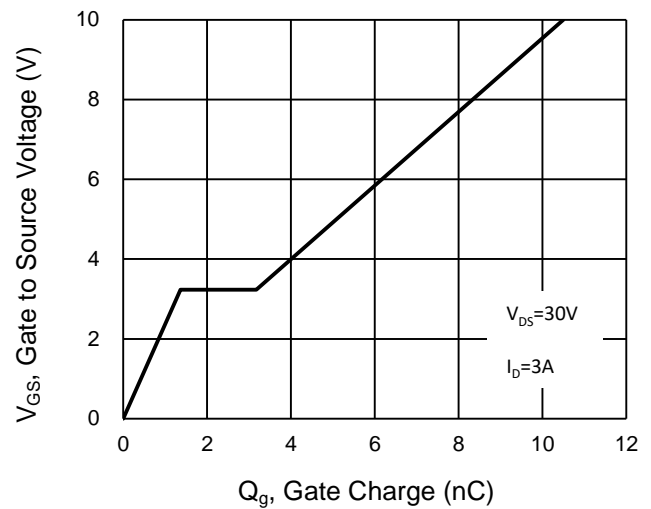
Transfer Characteristics



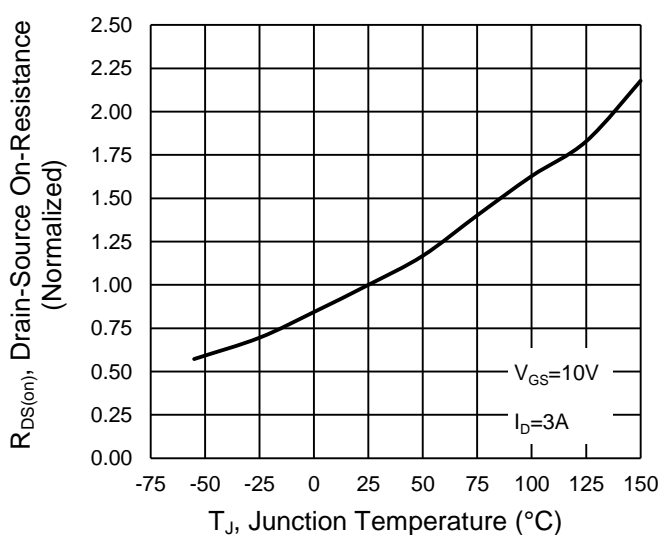
On-Resistance vs. Drain Current



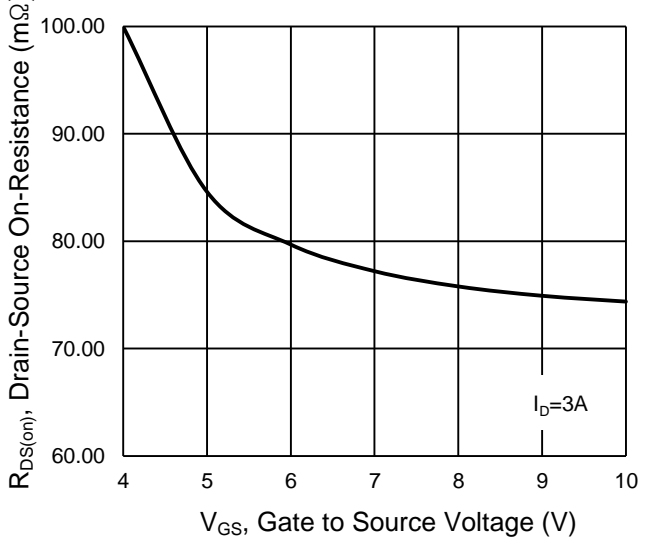
Gate-Source Voltage vs. Gate Charge



On-Resistance vs. Junction Temperature

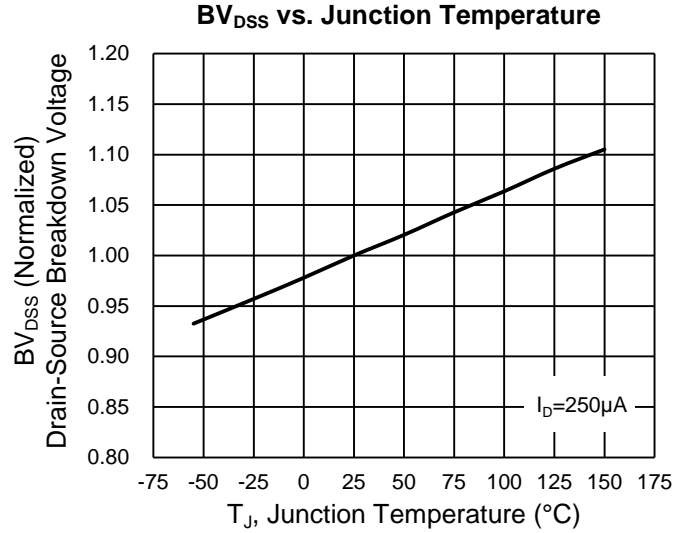
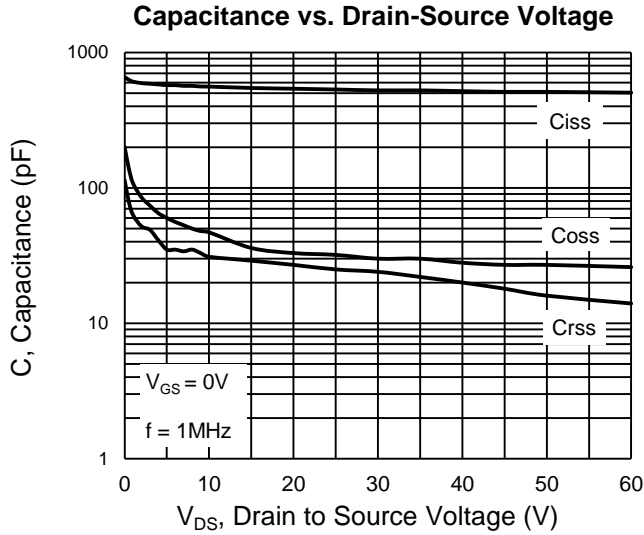


On-Resistance vs. Gate-Source Voltage

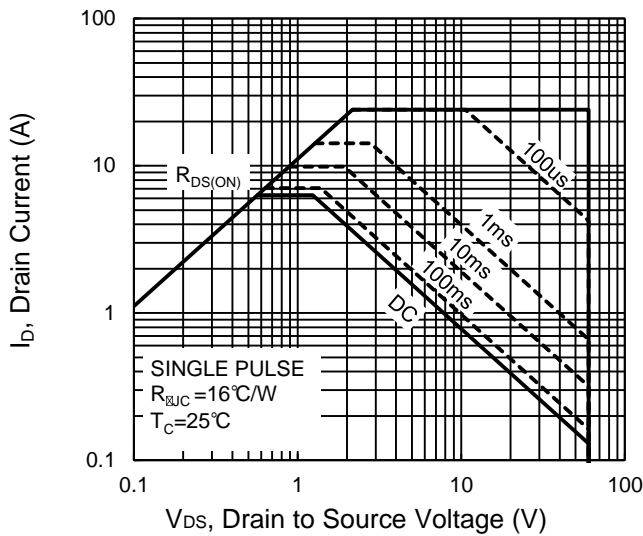


CHARACTERISTICS CURVES

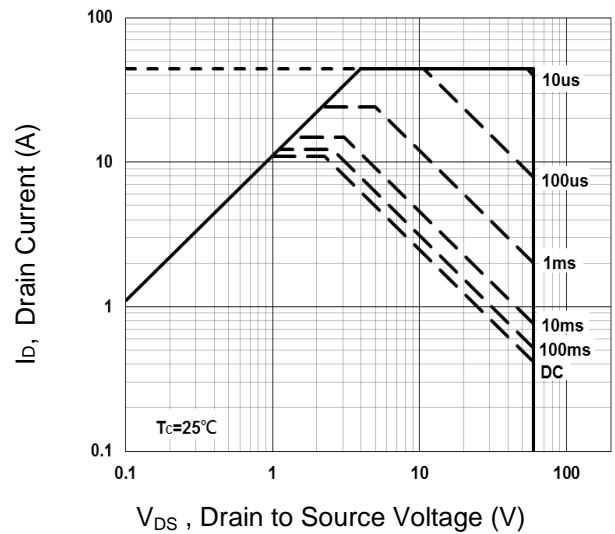
($T_A = 25^\circ\text{C}$ unless otherwise noted)



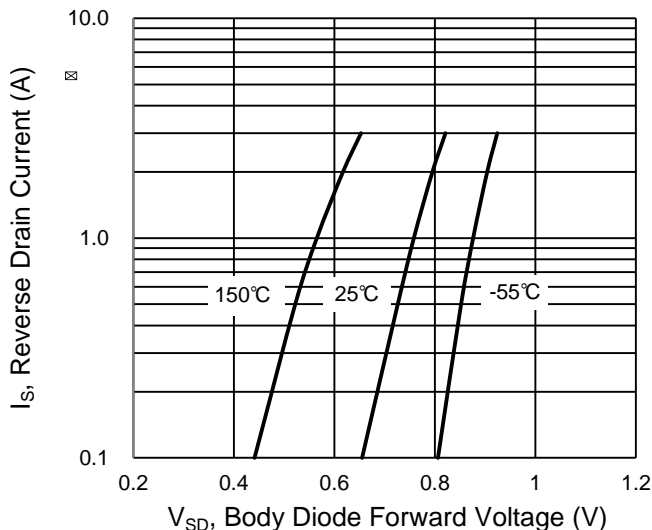
Maximum Safe Operating Area, Junction-to-Case(SOT-223)



Maximum Safe Operating Area, Junction-to-Case(TO-252)



Source-Drain Diode Forward Current vs. Voltage

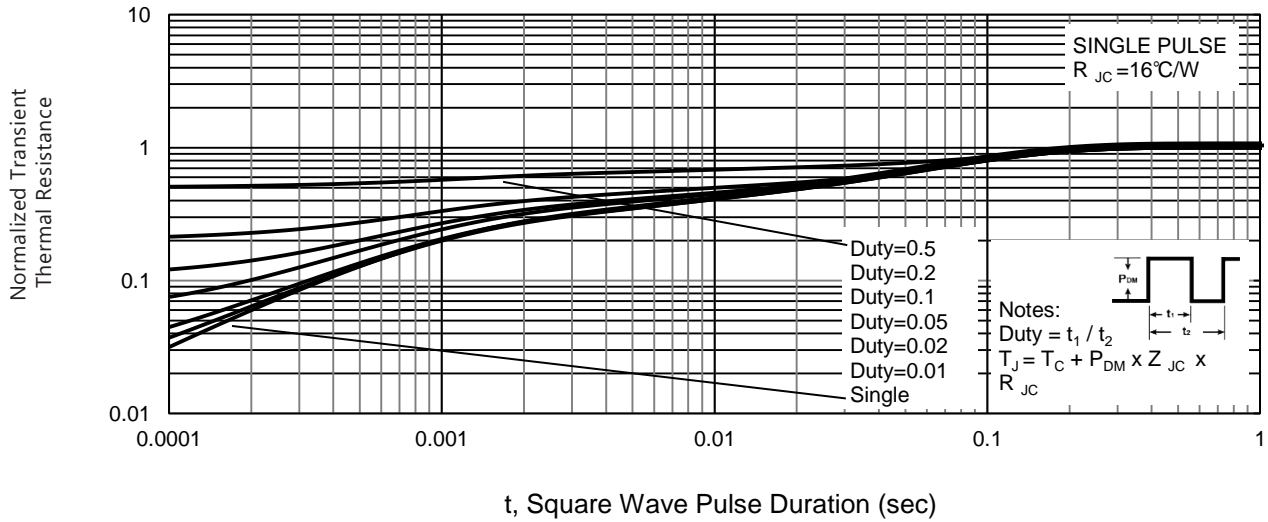




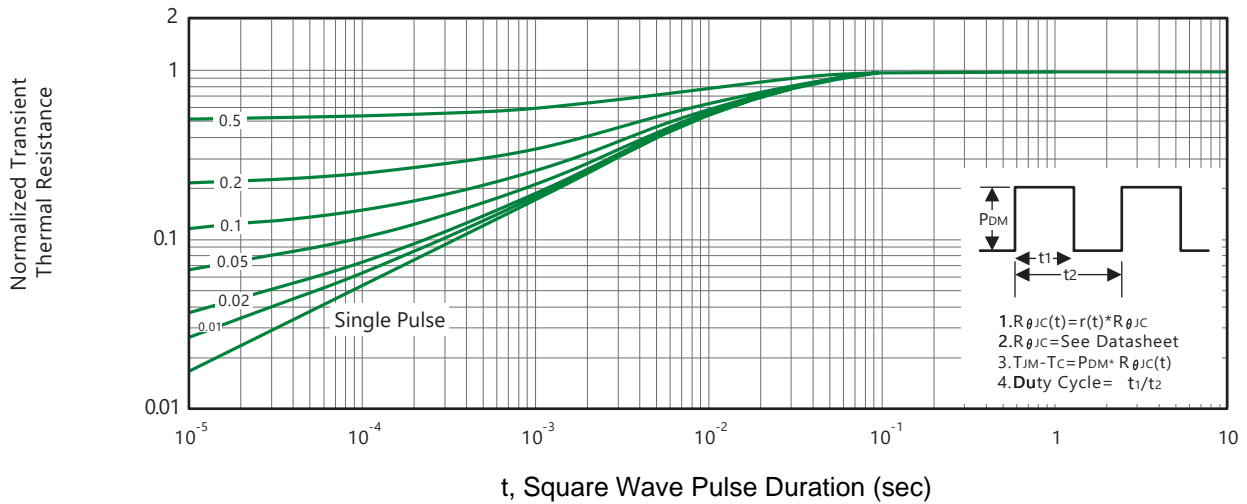
CHARACTERISTICS CURVES

($T_A = 25^\circ\text{C}$ unless otherwise noted)

Normalized Thermal Transient Impedance, Junction-to-Cas (SOT-223)



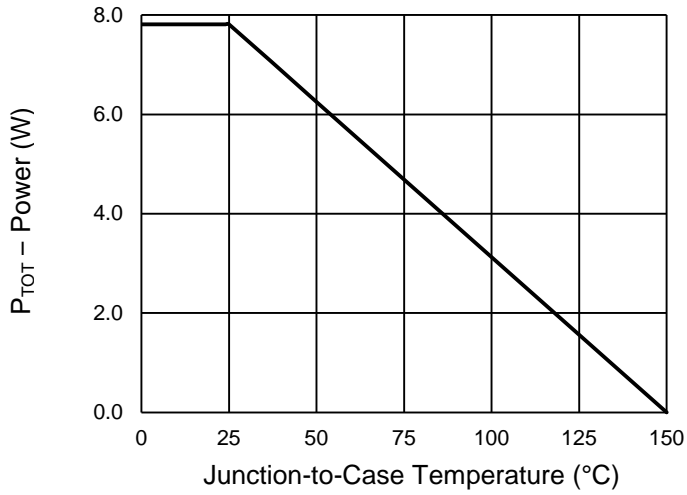
Normalized Thermal Transient Impedance, Junction-to-Cas (TO-252)



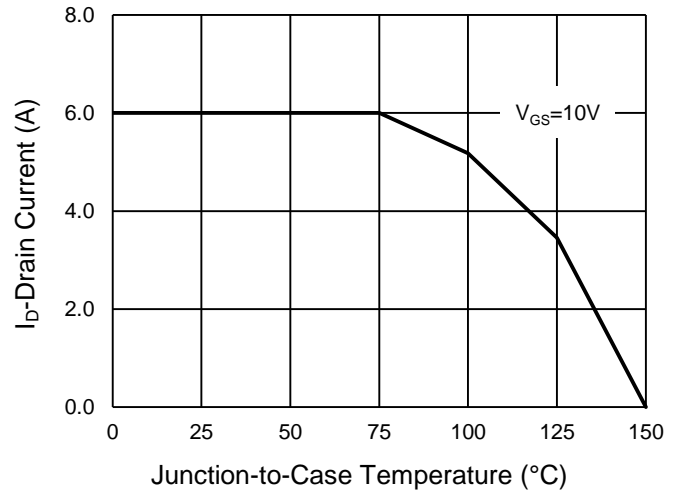
CHARACTERISTICS CURVES

($T_A = 25^\circ\text{C}$ unless otherwise noted)

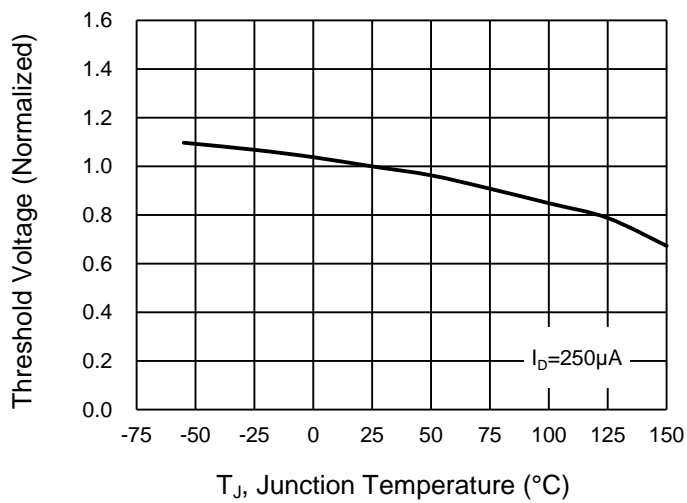
Power Dissipation (SOT-223)



Drain Current (SOT-223)

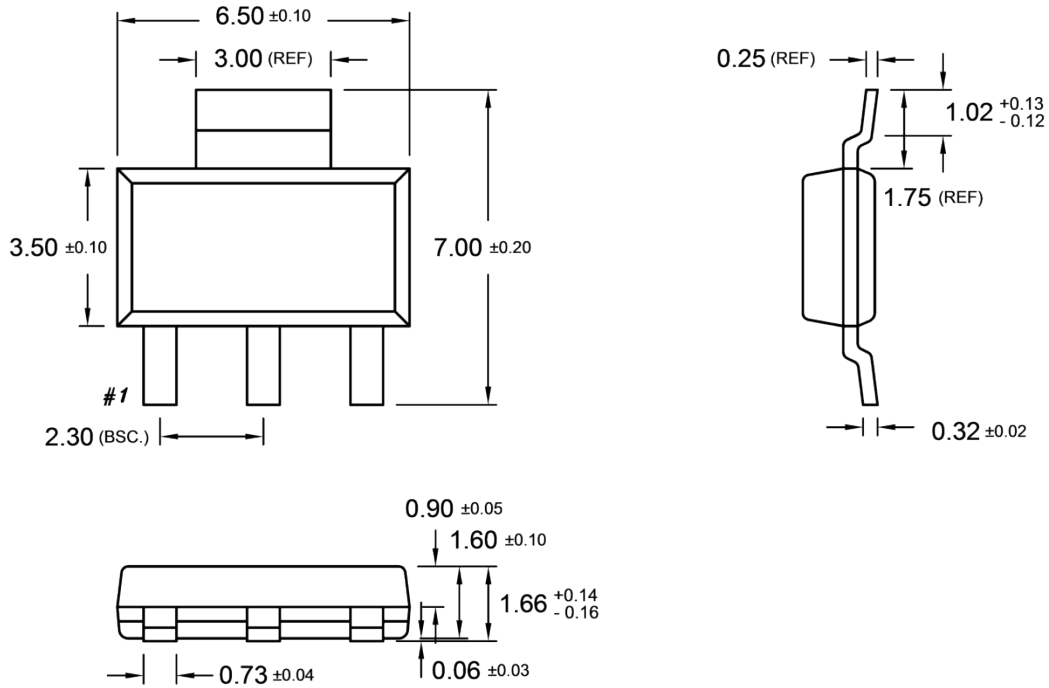


Normalized gate threshold voltage vs Temperature

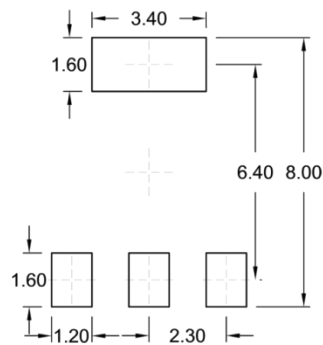


PACKAGE OUTLINE DIMENSIONS (Unit: Millimeters)

SOT-223

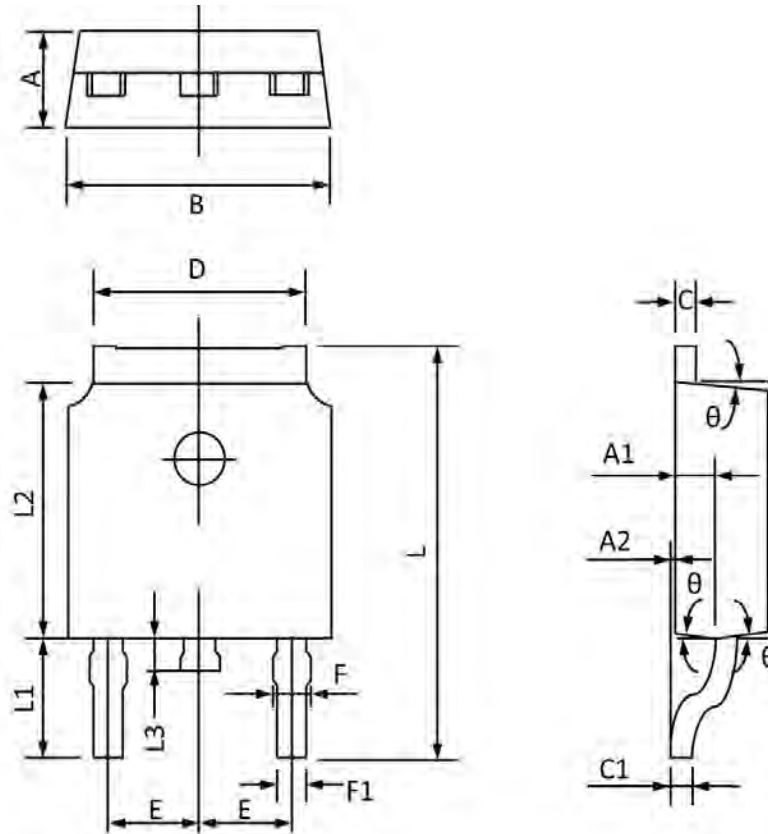


SUGGESTED PAD LAYOUT (Unit: Millimeters)



PACKAGE OUTLINE DIMENSIONS (Unit: Millimeters)

TO-252



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MAX	MIN	MAX	MIN
A	2.450	2.150	0.096	0.085
A1	1.200	0.910	0.047	0.036
A2	0.150	0.000	0.006	0.000
B	6.800	6.300	0.268	0.248
C	0.580	0.350	0.023	0.014
C1	0.550	0.380	0.022	0.015
D	5.500	5.100	0.217	0.201
E	2.390	2.000	0.094	0.079
F	0.940	0.600	0.037	0.024
F1	0.860	0.500	0.034	0.020
L	10.400	9.400	0.409	0.370
L1	3.000	2.400	0.118	0.094
L2	6.200	5.300	0.244	0.209
L3	1.200	0.600	0.047	0.024
θ	9°	3°	9°	3°