Pb Free Plating Product

2SK2837

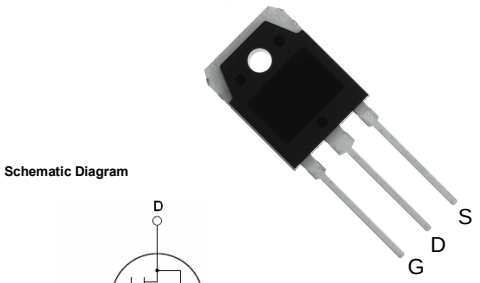
THINKISEMI 20A,500V N-CHANNEL PLANAR STRIPE POWER MOSFETs

Features
※ Low ON Resistance
※ Low Gate Charge
※ Peak Current vs Pulse Width Curve
※ ESD Capability Improved
※ 100% Avalanche Tested

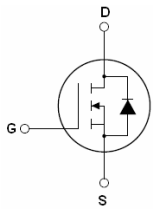
Application
※ Uninterruptible Power Supply(UPS)
※ LCD Panel Power
※ DC-AC Inverter,Amplifier and SMPS

Mechanical Data
※ Case:TO-3P non-isolated package
※ Epoxy: UL 94V-0 rate flame retardant
※ Terminals: Solderable per MIL-STD-202 method 208
※ Polarity: As per configuration
※ Mounting position: Any
※ Weight: 6.0 gram approximately

TO-3P pkg outline & internal configuration



Schematic Diagram



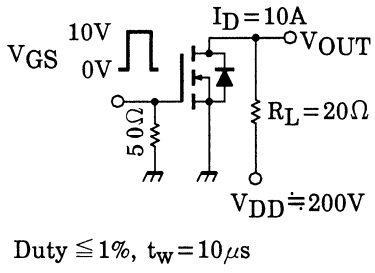
Absolute Maximum Ratings (Ta = 25°C)

Characteristics		Symbol	Rating	Unit
Drain−source voltage		V_{DSS}	500	V
Drain−gate voltage (R_{GS} = 20 kΩ)		V_{DGR}	500	V
Gate−source voltage		V_{GSS}	±30	V
Drain current	DC (Note 1)	I_D	20	A
	Pulse (Note 1)	I_{DP}	80	A
Drain power dissipation (Tc = 25°C)		P_D	150	W
Single pulse avalanche energy (Note 2)		E_{AS}	960	mJ
Avalanche current		I_{AR}	20	A
Repetitive avalanche energy (Note 3)		E_{AR}	15	mJ
Channel temperature		T_{ch}	150	°C
Storage temperature range		T_{stg}	−55 to 150	°C

Thermal Characteristics

Characteristics	Symbol	Max	Unit
Thermal resistance, channel to case	$R_{th\ (ch-c)}$	0.833	°C / W
Thermal resistance, channel to ambient	$R_{th\ (ch-a)}$	50	°C / W

Electrical Characteristics (Ta = 25°C)

Characteristics		Symbol	Test Condition	Min	Typ.	Max	Unit
Gate leakage current		I_{GSS}	V_{GS} = ±25 V, V_{DS} = 0 V	—	—	±10	μA
Gate−source breakdown voltage		$V_{(BR)\ GSS}$	I_G = ±10 μA, V_{DS} = 0 V	±30	—	—	V
Drain cut−off current		I_{DSS}	V_{DS} = 500 V, V_{GS} = 0 V	—	—	100	μA
Drain−source breakdown voltage		$V_{(BR)\ DSS}$	I_D = 10 mA, V_{GS} = 0 V	500	—	—	V
Gate threshold voltage		V_{th}	V_{DS} = 10 V, I_D = 1 mA	2.0	—	4.0	V
Drain−source ON resistance		$R_{DS\ (ON)}$	V_{GS} = 10 V, I_D = 10 A	—	0.21	0.27	Ω
Forward transfer admittance		$\|Y_{fs}\|$	V_{DS} = 10 V, I_D = 10 A	10	17	—	S
Input capacitance		C_{iss}	V_{DS} = 10 V, V_{GS} = 0 V, f = 1 MHz	—	3720	—	pF
Reverse transfer capacitance		C_{rss}		—	340	—	
Output capacitance		C_{oss}		—	1165	—	
Switching time	Rise time	t_r		—	30	—	ns
	Turn−on time	t_{on}		—	70	—	
	Fall time	t_f		—	50	—	
	Turn−off time	t_{off}		—	290	—	
Total gate charge (gate−source plus gate−drain)		Q_g	V_{DD} ≈ 400 V, V_{GS} = 10 V, I_D = 6 A	—	80	—	nC
Gate−source charge		Q_{gs}		—	48	—	
Gate−drain (“miller”) Charge		Q_{gd}		—	32	—	

Source−Drain Ratings and Characteristics (Ta = 25°C)

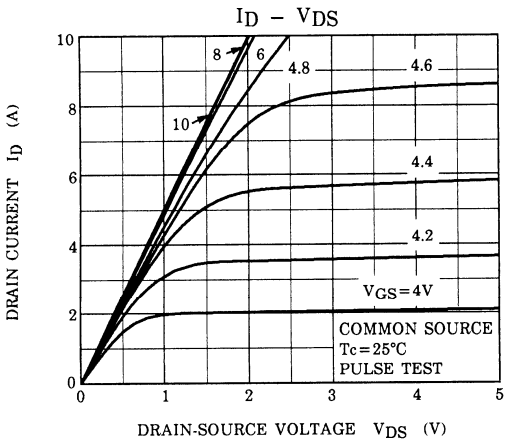
Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Continuous drain reverse current (Note 1)	I_{DR}	—	—	—	20	A
Pulse drain reverse current (Note 1)	I_{DRP}	—	—	—	80	A
Forward voltage (diode)	V_{DSF}	I_{DR} = 20 A, V_{GS} = 0 V	—	—	−1.7	V
Reverse recovery time	t_{rr}	I_{DR} = 20 A, V_{GS} = 0 V dI_{DR} / dt = 100 A / μs	—	540	—	ns
Reverse recovery charge	Q_{rr}		—	5.4	—	μC

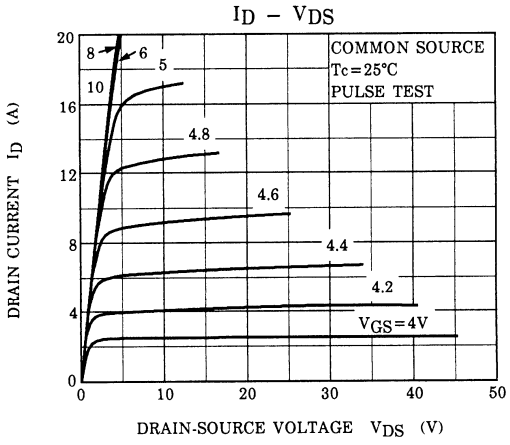
Note 1: Please use devices on condition that the channel temperature is below 150°C.

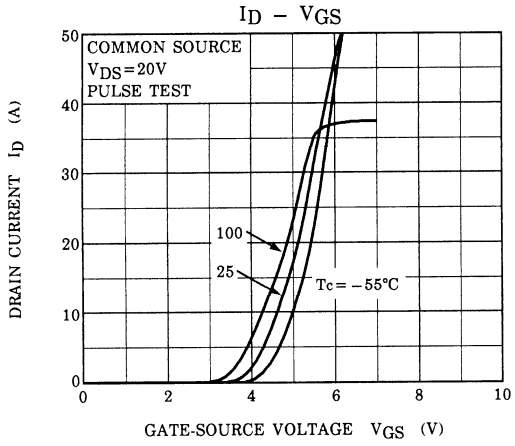
Note 2: V_{DD} = 90 V, T_{ch} = 25°C (initial), L = 4.08 mH, R_G = 25 Ω, I_{AR} = 20 A

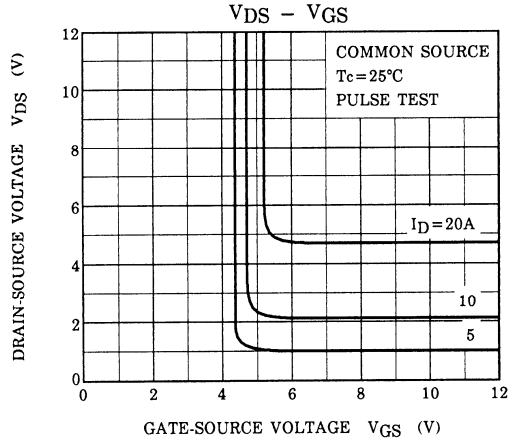
Note 3: Repetitive rating: Pulse width limited by maximum channel temperature

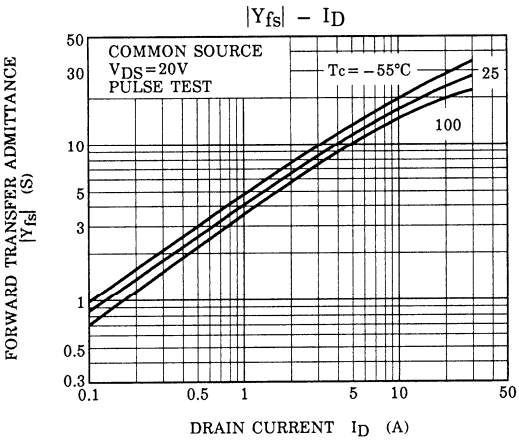
This transistor is an electrostatic sensitive device.
Please handle with caution.

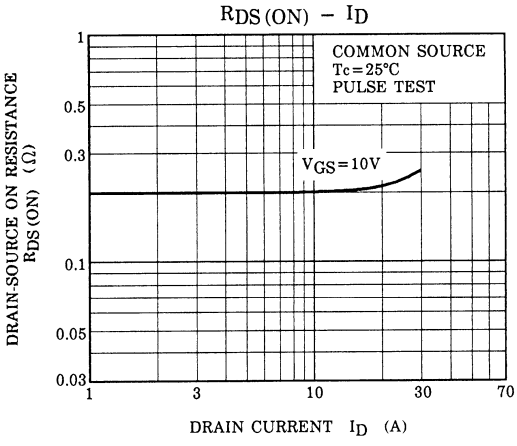




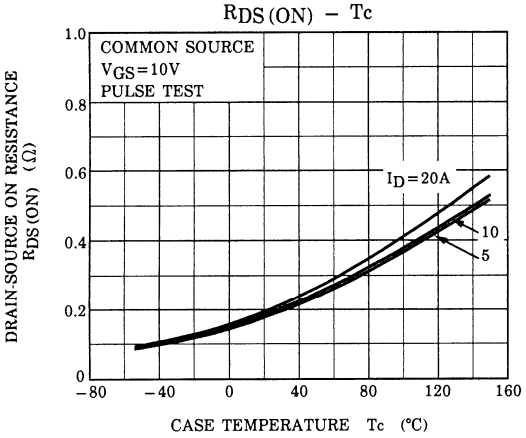




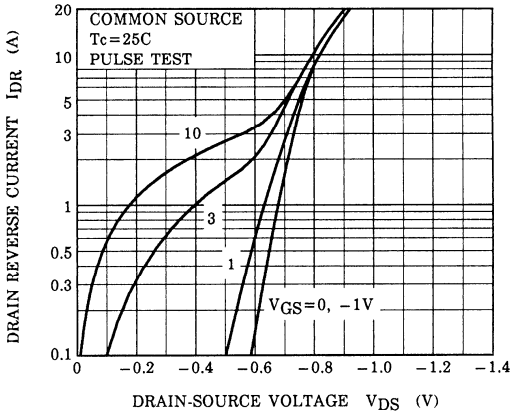




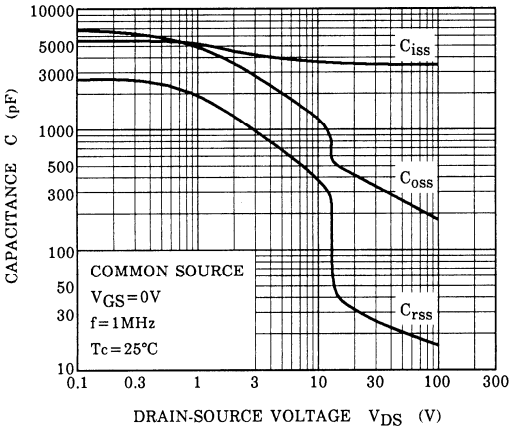
$R_{DS(ON)}$ – Tc



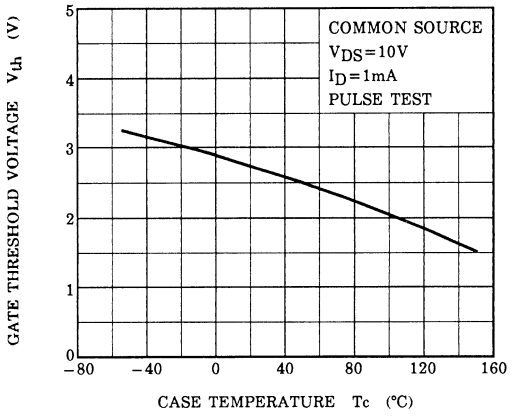
I_{DR} – V_{DS}



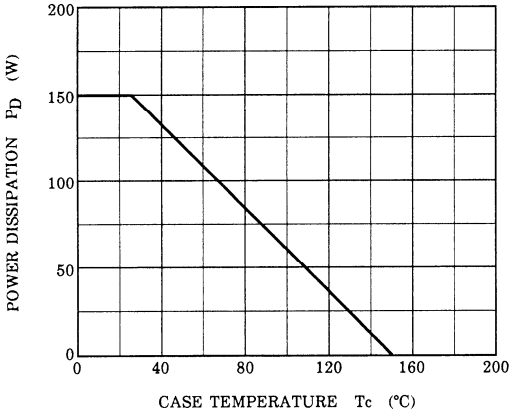
CAPACITANCE – V_{DS}



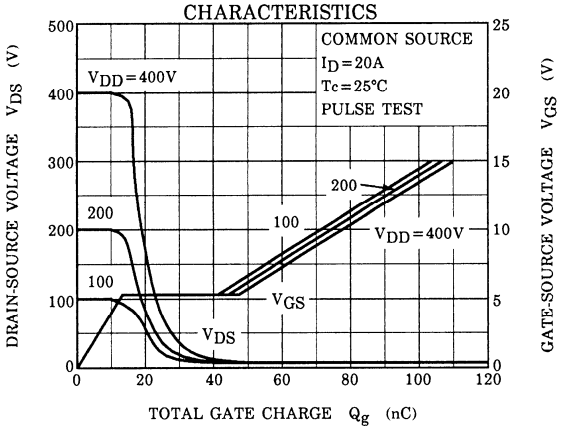
V_{th} – Tc



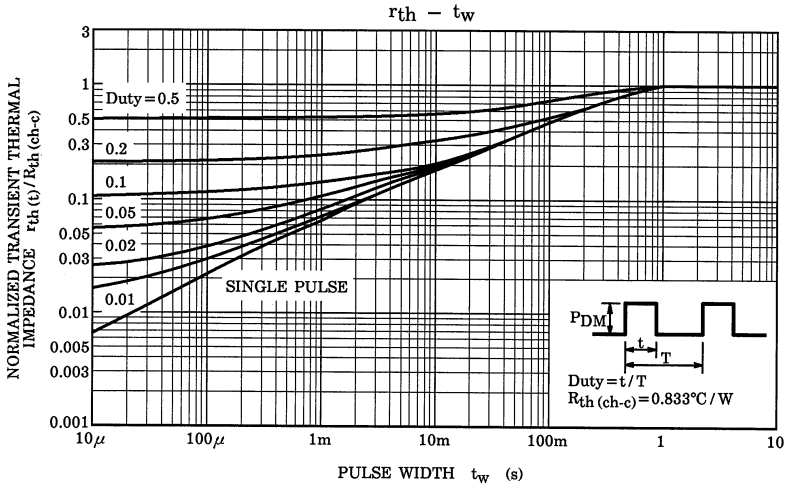
P_D – Tc



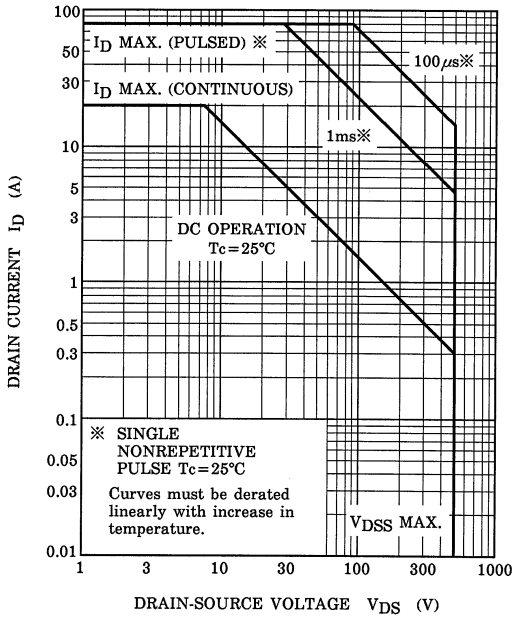
DYNAMIC INPUT / OUTPUT CHARACTERISTICS



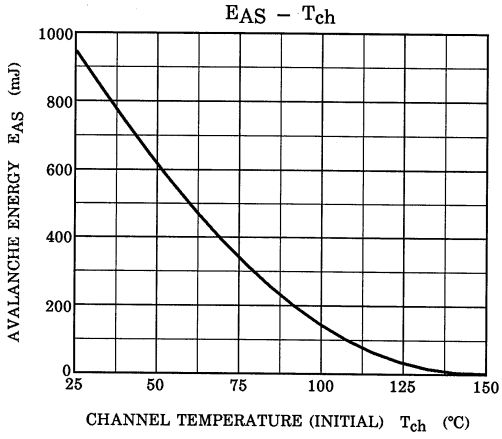
r_{th} – t_w

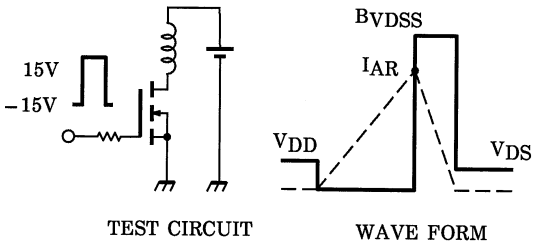


SAFE OPERATING AREA



E_{AS} – T_{ch}



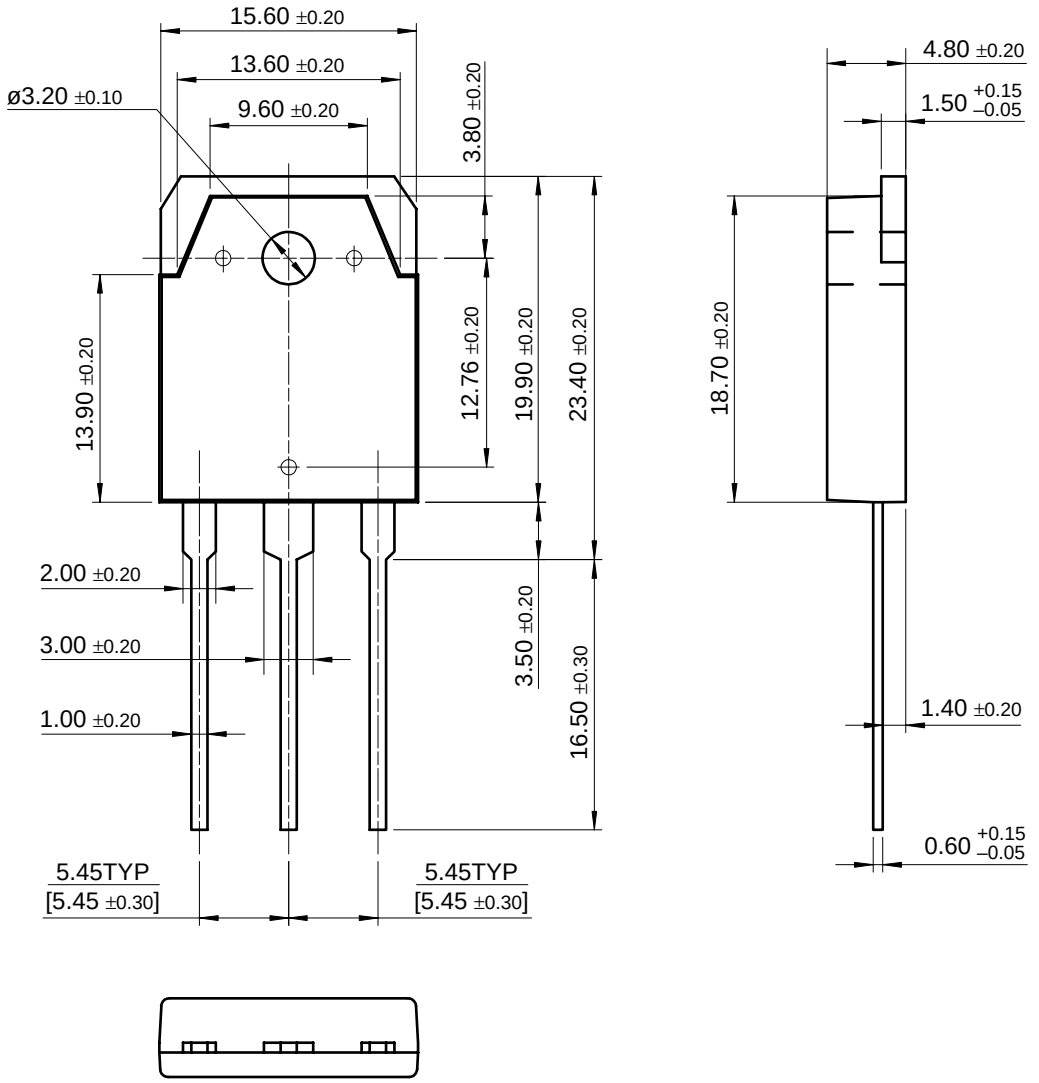


$R_G = 25\ \Omega$
$V_{DD} = 90$ V, L = 4.08 mH

$$E_{AS} = \frac{1}{2} \cdot L \cdot I^2 \cdot \left(\frac{B_{VDSS}}{B_{VDSS} - V_{DD}} \right)$$

THINKI TO-3P Package Dimensions

TO-3PN-SQ/TO-3PB-SQ



Dimensions in Millimeters