ZX3CD3S1M832

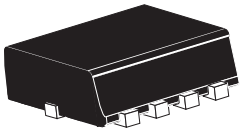
MPPS™ Miniature Package Power Solutions
40V PNP LOW SATURATION TRANSISTOR AND 40V, 1A SCHOTTKY DIODE COMBINATION DUAL

SUMMARY
PNP Transistor — V_{CEO} =-40V; R_{SAT} = 104mΩ; I_C = -3A

Schottky Diode — V_R = 40V; V_F = 500mV (@1A); I_C=1A

DESCRIPTION

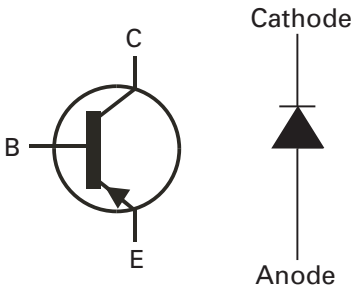
Packaged in the new innovative 3mm x 2mm MLP this combination dual comprises an ultra low saturation PNP transistor and a 1A Schottky barrier diode. This excellent combination provides users with highly efficient performance in applications including DC-DC and charging circuits.



3mm x 2mm Dual Die MLP

Users will also gain several other **key benefits**:

- **Performance capability equivalent to much larger packages**
- **Improved circuit efficiency & power levels**
- **PCB area and device placement savings**
- **Lower package height (0.9mm nom)**
- **Reduced component count**



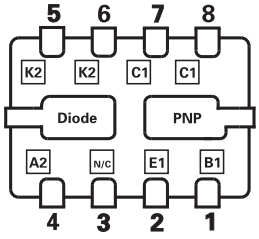
FEATURES

- Extremely Low Saturation Voltage **(-220mV @-1A)**
- H_{FE} characterised up to -3A
- I_C = -3A Continuous Collector Current
- **Extremely Low V_F, fast switching Schottky**
- 3mm x 2mm MLP

APPLICATIONS

- DC - DC Converters
- Mobile Phones
- Charging Circuits
- Motor control

PINOUT



3mm x 2mm Dual MLP
underside view

ORDERING INFORMATION

DEVICE	REEL	TAPE WIDTH	QUANTITY PER REEL
ZX3CD3S1M832TA	7''	8mm	3000
ZX3CD3S1M832TC	13''	8mm	10000

DEVICE MARKING
3S1

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ABSOLUTE MAXIMUM RATINGS.

PARAMETER	SYMBOL	VALUE	UNIT
Transistor			
Collector-Base Voltage	V_{CBO}	-50	V
Collector-Emitter Voltage	V_{CEO}	-40	V
Emitter-Base Voltage	V_{EBO}	-7.5	V
Peak Pulse Current	I_{CM}	-4	A
Continuous Collector Current (a)(f)	I_C	-3	A
Base Current	I_B	1000	mA
Power Dissipation at TA=25°C (a)(f) Linear Derating Factor	P_D	1.5 12	W mW/°C
Power Dissipation at TA=25°C (b)(f) Linear Derating Factor	P_D	2.45 19.6	W mW/°C
Power Dissipation at TA=25°C (c)(f) Linear Derating Factor	P_D	1 8	W mW/°C
Power Dissipation at TA=25°C (d)(f) Linear Derating Factor	P_D	1.13 9	W mW/°C
Power Dissipation at TA=25°C (d)(g) Linear Derating Factor	P_D	1.7 13.6	W mW/°C
Power Dissipation at TA=25°C (e)(g) Linear Derating Factor	P_D	3 24	W mW/°C
Storage Temperature Range	T_{stg}	-55 to +150	°C
Junction Temperature	T_j	150	°C

THERMAL RESISTANCE

PARAMETER	SYMBOL	VALUE	UNIT
Junction to Ambient (a)(f)	$R_{\theta JA}$	83	°C/W
Junction to Ambient (b)(f)	$R_{\theta JA}$	51	°C/W
Junction to Ambient (c)(f)	$R_{\theta JA}$	125	°C/W
Junction to Ambient (d)(f)	$R_{\theta JA}$	111	°C/W
Junction to Ambient (d)(g)	$R_{\theta JA}$	73.5	°C/W
Junction to Ambient (e)(g)	$R_{\theta JA}$	41.7	°C/W

Notes

(a) For a dual device surface mounted on 8 sq cm single sided 2oz copper on FR4 PCB, in still air conditions **with all exposed pads attached**. The copper area is split down the centre line into two separate areas with one half connected to each half of the dual device.

(b) Measured at t<5 secs for a dual device surface mounted on 8 sq cm single sided 2oz copper on FR4 PCB, in still air conditions **with all exposed pads attached**. The copper area is split down the centre line into two separate areas with one half connected to each half of the dual device.

(c) For a dual device surface mounted on 8 sq cm single sided 2oz copper on FR4 PCB, in still air conditions **with minimal lead connections only**.

(d) For a dual device surface mounted on 10 sq cm single sided 1oz copper on FR4 PCB, in still air conditions **with all exposed pads attached attached**. The copper area is split down the centre line into two separate areas with one half connected to each half of the dual device.

(e) For a dual device surface mounted on 85 sq cm single sided 2oz copper on FR4 PCB, in still air conditions **with all exposed pads attached attached**. The copper area is split down the centre line into two separate areas with one half connected to each half of the dual device.

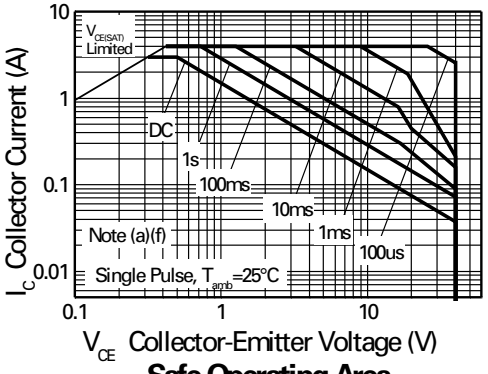
(f) For a dual device with one active die.

(g) For dual device with 2 active die running at equal power.

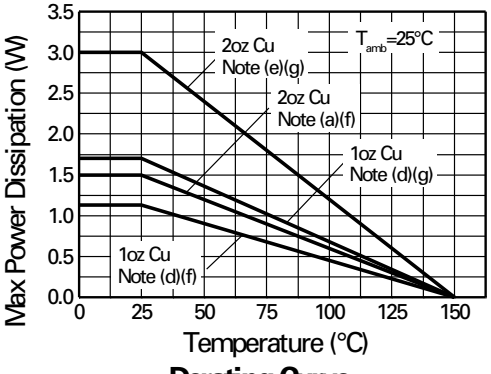
(h) Repetitive rating - pulse width limited by max junction temperature. Refer to Transient Thermal Impedance graph.

(i) The minimum copper dimensions required for mounting are no smaller than the exposed metal pads on the base of the device as shown in the package dimensions data. The thermal resistance for a dual device mounted on 1.5mm thick FR4 board using minimum copper 1 oz weight, 1mm wide tracks and one half of the device active is Rth = 250°C/W giving a power rating of Ptot = 500mW.

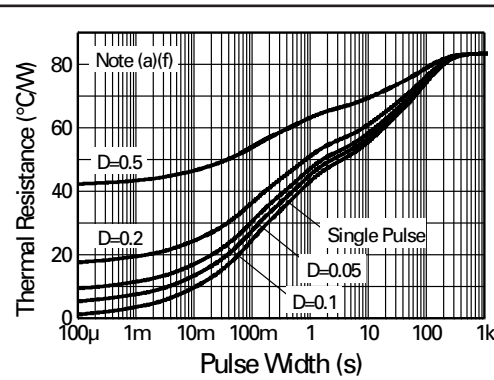
TRANSISTOR TYPICAL CHARACTERISTICS



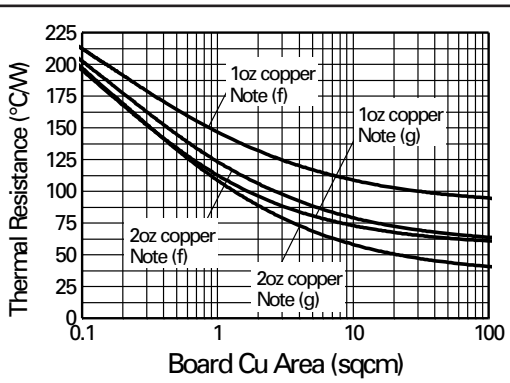
Safe Operating Area



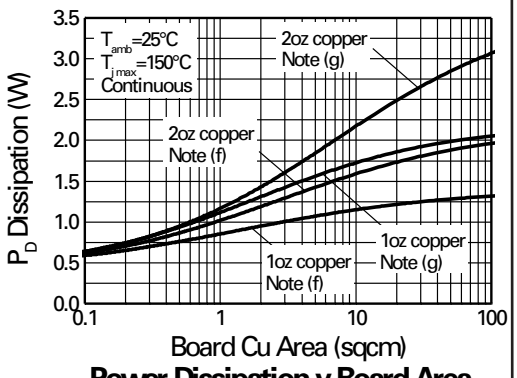
Derating Curve



Transient Thermal Impedance



Thermal Resistance v Board Area



Power Dissipation v Board Area

ABSOLUTE MAXIMUM RATINGS.

PARAMETER	SYMBOL	VALUE	UNIT
Schottky Diode			
Continuous Reverse Voltage	V_R	40	V
Forward Voltage @ I_F=1000mA(typ)	V_F	425	mV
Forward Current	I_F	1850	mA
Average Peak Forward Current D=50%	I_{FAV}	3	A
Non Repetitive Forward Current t≤ 100μs t≤ 10ms	I_{FSM}	12 7	A A
Power Dissipation at TA=25°C (a)(f) Linear Derating Factor	P_D	1.2 12	W mW/°C
Power Dissipation at TA=25°C (b)(f) Linear Derating Factor	P_D	2 20	W mW/°C
Power Dissipation at TA=25°C (c)(f) Linear Derating Factor	P_D	0.8 8	W mW/°C
Power Dissipation at TA=25°C (d)(f) Linear Derating Factor	P_D	0.9 9	W mW/°C
Power Dissipation at TA=25°C (d)(g) Linear Derating Factor	P_D	1.36 13.6	W mW/°C
Power Dissipation at TA=25°C (e)(g) Linear Derating Factor	P_D	2.4 24	W mW/°C
Storage Temperature Range	T_{stg}	-55 to +150	°C
Junction Temperature	T_j	125	°C

THERMAL RESISTANCE

PARAMETER	SYMBOL	VALUE	UNIT
Junction to Ambient (a)(f)	$R_{\theta JA}$	83	°C/W
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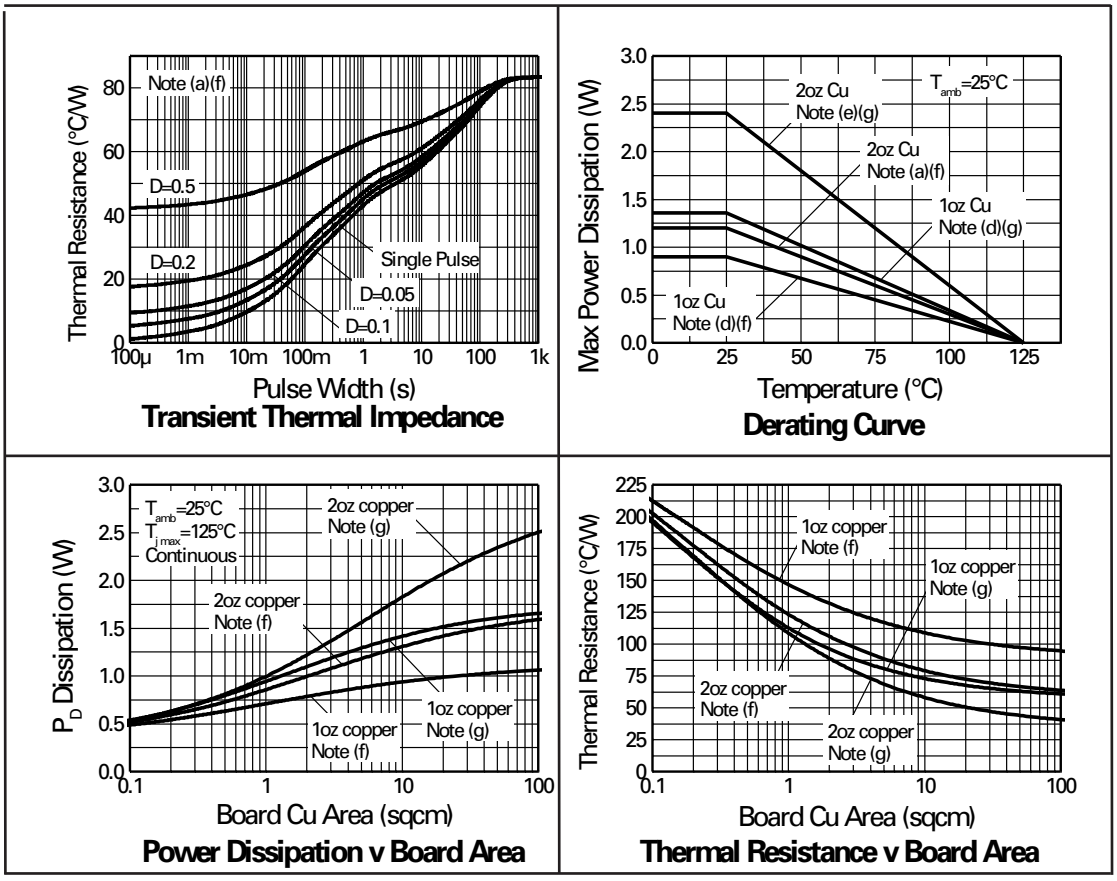
(h) Repetitive rating - pulse width limited by max junction temperature. Refer to Transient Thermal Impedance graph.

(i) The minimum copper dimensions required for mounting are no smaller than the exposed metal pads on the base of the device as shown in the package dimensions data. The thermal resistance for a dual device mounted on 1.5mm thick FR4 board using minimum copper 1 oz weight, 1mm wide tracks and one half of the device active is Rth = 250°C/W giving a power rating of Ptot = 400mW.

SCHOTTKY TYPICAL CHARACTERISTICS

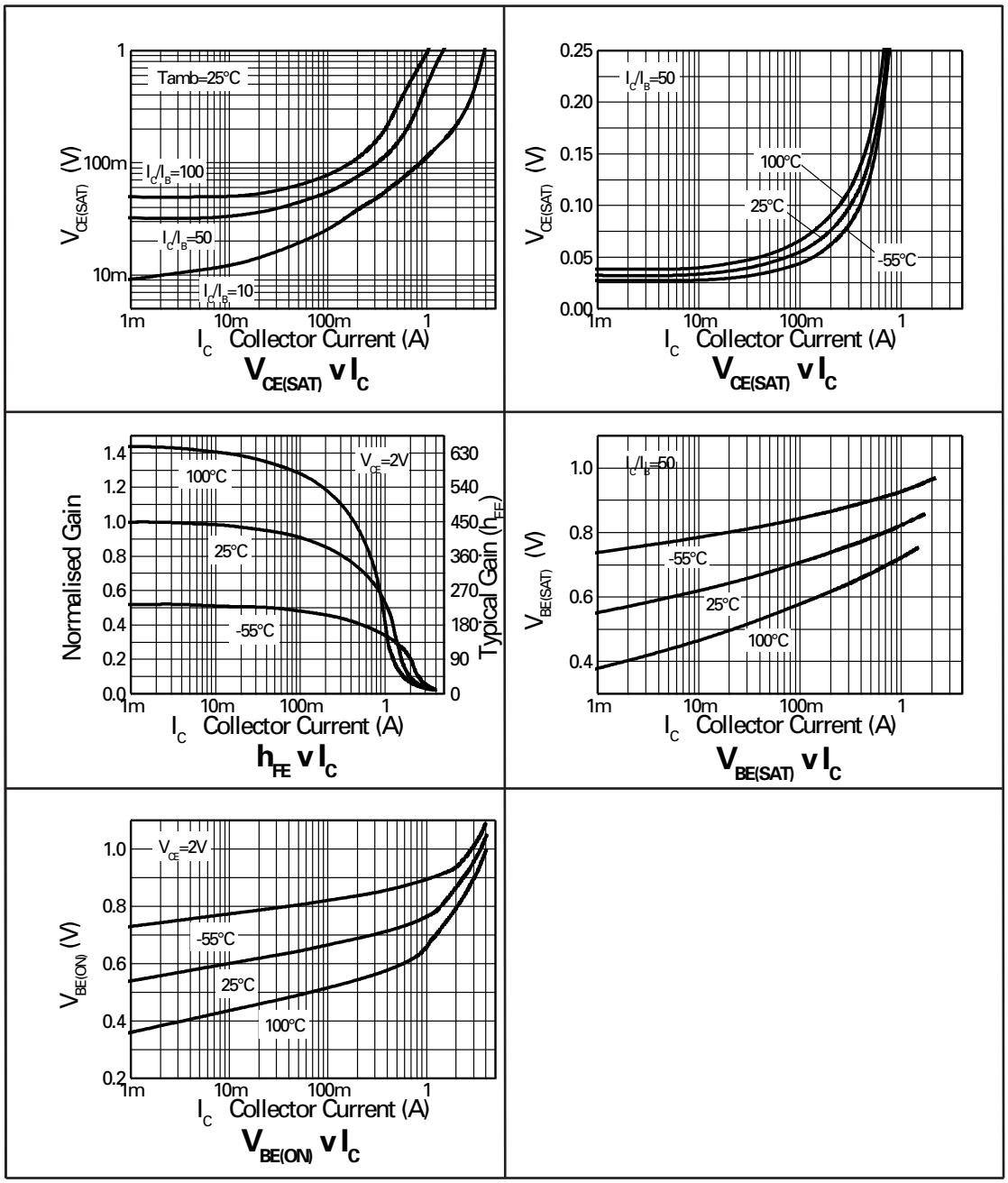


ELECTRICAL CHARACTERISTICS (at T_{amb} = 25°C unless otherwise stated).

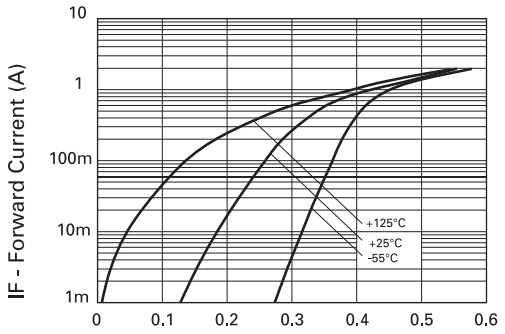
PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS.
TRANSISTOR ELECTRICAL CHARACTERISTICS						
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	-50	-80		V	I_C=-100μA
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	-40	-70		V	I_C=-10mA*
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	-7.5	-8.5		V	I_E=-100μA
Collector Cut-Off Current	I_{CBO}			-25	nA	V_{CB}=-40V
Emitter Cut-Off Current	I_{EBO}			-25	nA	V_{EB}=-6V
Collector Emitter Cut-Off Current	I_{CES}			-25	nA	V_{CES}=-32V
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$		-25 -150 -195 -210 -260	-40 -220 -300 -300 -370	mV mV mV mV mV	I_C=-0.1A, I_B=-10mA* I_C=-1A, I_B=-50mA* I_C=-1.5A, I_B=-100mA* I_C=-2A, I_B=-200mA* I_C=-2.5A, I_B=-250mA*
Base-Emitter Saturation Voltage	$V_{BE(sat)}$		-0.97	-1.05	V	I_C=-2.5A, I_B=-250mA*
Base-Emitter Turn-On Voltage	$V_{BE(on)}$		-0.89	-0.95	V	I_C=-2.5A, V_{CE}=-2V*
Static Forward Current Transfer Ratio	h_{FE}	300 300 180 60 12	480 450 290 130 22			I_C=-10mA, V_{CE}=-2V* I_C=-0.1A, V_{CE}=-2V* I_C=-1A, V_{CE}=-2V* I_C=-1.5A, V_{CE}=-2V* I_C=-3A, V_{CE}=-2V*
Transition Frequency	f_T	150	190		MHz	I_C=-50mA, V_{CE}=-10V f=100MHz
Output Capacitance	C_{obo}		19	25	pF	V_{CB}=-10V, f=1MHz
Turn-On Time	$t_{(on)}$		40		ns	V_{CC}=-15V, I_C=-0.75A I_{B1}=I_{B2}=-15mA
Turn-Off Time	$t_{(off)}$		435		ns	
SCHOTTKY DIODE ELECTRICAL CHARACTERISTICS						
Reverse Breakdown Voltage	$V_{(BR)R}$	40	60		V	I_R=300μA
Forward Voltage	V_F		240 265 305 355 390 425 495 420	270 290 340 400 450 500 600 —	mV mV mV mV mV mV mV mV	I_F=50mA* I_F=100mA* I_F=250mA* I_F=500mA* I_F=750mA* I_F=1000mA* I_F=1500mA* I_F=1000mA,T_a=100°C*
Reverse Current	I_R		50	100	μA	V_R=30V
Diode Capacitance	C_D		25		pF	f=1MHz,V_R=25V
Reverse Recovery Time	t_{rr}		12		ns	switched from I_F = 500mA to I_R = 500mA Measured at I_R = 50mA

*Measured under pulsed conditions.

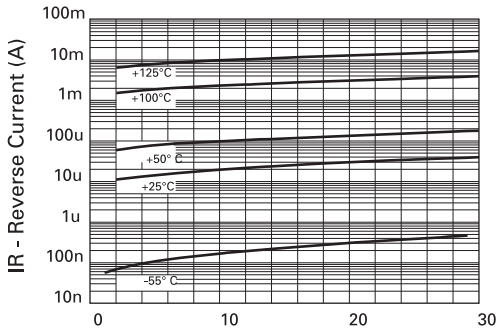
TRANSISTOR TYPICAL CHARACTERISTICS



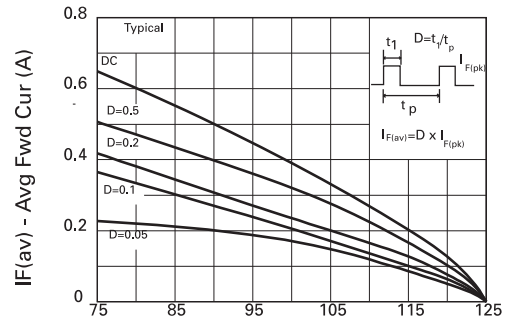
SCHOTTKY TYPICAL CHARACTERISTICS



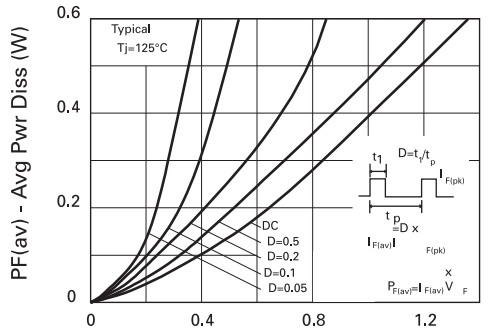
I_F v V_F



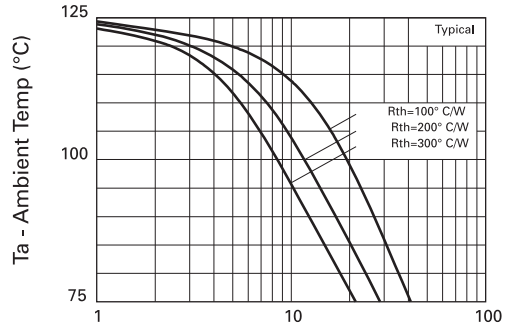
I_R v V_R



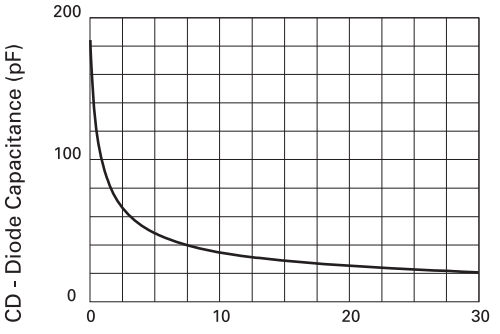
$I_{F(av)}$ v T_C



$P_{F(av)}$ v $I_{F(av)}$

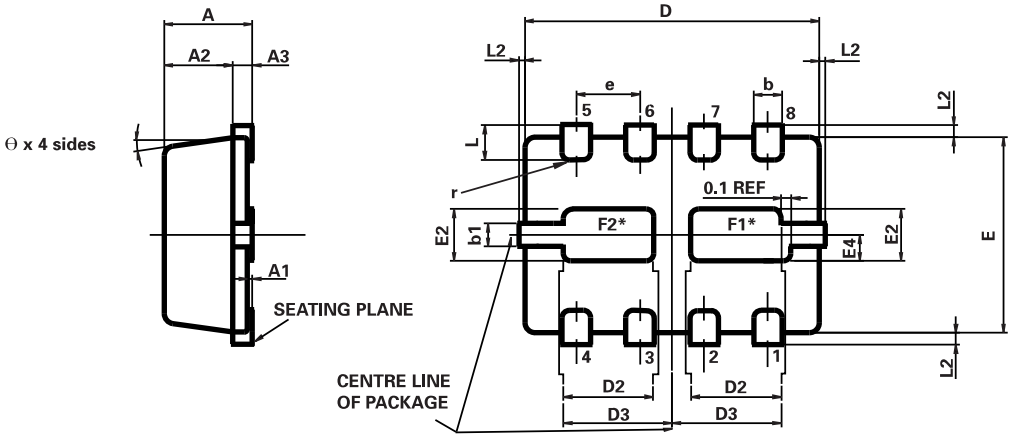


T_a v V_R



C_D v V_R

MLP832 PACKAGE OUTLINE (3mm x 2mm Micro Leaded Package)



***Exposed Flags. Solder connection to improve thermal dissipation is optional.**
F1 at collector 1 potential
F2 at collector 2 potential

CONTROLLING DIMENSIONS IN MILLIMETRES
APPROX. CONVERTED DIMENSIONS IN INCHES

MLP832 PACKAGE DIMENSIONS

DIM	MILLIMETRES		INCHES		DIM	MILLIMETRES		INCHES	
	MIN.	MAX.	MIN.	MAX.		MIN.	MAX.	MIN.	MAX.
A	0.80	1.00	0.031	0.039	e	0.65 REF		0.0256 BSC	
A1	0.00	0.05	0.00	0.002	E	2.00 BSC		0.0787 BSC	
A2	0.65	0.75	0.0255	0.0295	E2	0.43	0.63	0.017	0.0249
A3	0.15	0.25	0.006	0.0098	E4	0.16	0.36	0.006	0.014
b	0.24	0.34	0.009	0.013	L	0.20	0.45	0.0078	0.0157
b1	0.17	0.30	0.0066	0.0118	L2	———	0.125	0.00	0.005
D	3.00 BSC		0.118 BSC		r	0.075 BSC		0.0029 BSC	
D2	0.82	1.02	0.032	0.040	θ	0°	12°	0°	12°
D3	1.01	1.21	0.0397	0.0476					

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ISSUE 3 - OCTOBER 2007

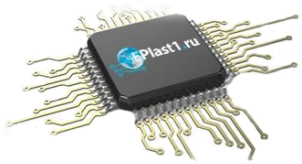
Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits,General Dynamics и др.);

Помимо этого, одним из направлений компании «ЭлектроПласт» является направление «Источники питания». Мы предлагаем Вам помощь Конструкторского отдела:

- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



Как с нами связаться

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