



P-Channel Enhancement-Mode Vertical DMOS FET

Features

- ▶ Low threshold (-2.4V max.)
- ▶ High input impedance
- ▶ Low input capacitance (60pF typical)
- ▶ Fast switching speeds
- ▶ Low on-resistance
- ▶ Free from secondary breakdown
- ▶ Low input and output leakage

Applications

- ▶ Logic level interfaces - ideal for TTL and CMOS
- ▶ Solid state relays
- ▶ Battery operated systems
- ▶ Photo voltaic drives
- ▶ Analog switches
- ▶ General purpose line drivers
- ▶ Telecom switches

Ordering Information

Part Number	Package Option	Packing
TP2540N3-G	3-Lead TO-92	1000/Bag
TP2540N3-G P002		
TP2540N3-G P003		
TP2540N3-G P005	3-Lead TO-92	2000/Reel
TP2540N3-G P013		
TP2540N3-G P014		
TP2540N8-G	TO-243AA (SOT-89)	2000/Reel

-G denotes a lead (Pb)-free / RoHS compliant package.

Contact factory for Wafer / Die availability.

Devices in Wafer / Die form are lead (Pb)-free / RoHS compliant.

Absolute Maximum Ratings

Parameter	Value
Drain-to-source voltage	BV_{DSS}
Drain-to-gate voltage	BV_{DGS}
Gate-to-source voltage	$\pm 20V$
Operating and storage temperature	-55°C to +150°C

Absolute Maximum Ratings are those values beyond which damage to the device may occur. Functional operation under these conditions is not implied. Continuous operation of the device at the absolute rating level may affect device reliability. All voltages are referenced to device ground.

Typical Thermal Resistance

Package	θ_{ja}
TO-92	132°C/W
TO-243AA (SOT-89)	133°C/W

General Description

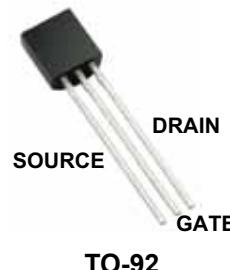
This low threshold, enhancement-mode (normally-off) transistor utilizes a vertical DMOS structure and Supertex's well-proven, silicon-gate manufacturing process. This combination produces a device with the power handling capabilities of bipolar transistors and the high input impedance and positive temperature coefficient inherent in MOS devices. Characteristic of all MOS structures, this device is free from thermal runaway and thermally-induced secondary breakdown.

Supertex's vertical DMOS FETs are ideally suited to a wide range of switching and amplifying applications where very low threshold voltage, high breakdown voltage, high input impedance, low input capacitance, and fast switching speeds are desired.

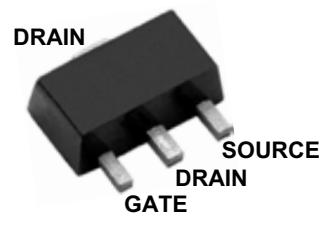
Product Summary

BV_{DSS}/BV_{DGS}	$R_{DS(ON)}$ (max)	$I_{D(ON)}$ (min)	$V_{GS(th)}$ (max)
-400V	25Ω	-2.4A	-0.4V

Pin Configuration



TO-92



TO-243AA (SOT-89)

Product Marking

SiTP
2 5 4 0
YYWW

YY = Year Sealed
WW = Week Sealed
_____ = "Green" Packaging

Package may or may not include the following marks: Si or TO-92

TP5DW

W = Code for week sealed
_____ = "Green" Packaging

Package may or may not include the following marks: Si or TO-243AA (SOT-89)

Thermal Characteristics

Package	I_D (continuous) [†]	I_D (pulsed)	Power Dissipation @ $T_A = 25^\circ\text{C}$	I_{DR} [†]	I_{DRM}
TO-92	-86mA	-600mA	0.74W	-86mA	-600mA
TO-243AA (SOT-89)	-125mA	-1.2A	1.6 [‡]	-125mA	-1.2A

[†] I_D (continuous) is limited by max rated T_J .

[‡] Mounted on FR5 board, 25mm x 25mm x 1.57mm.

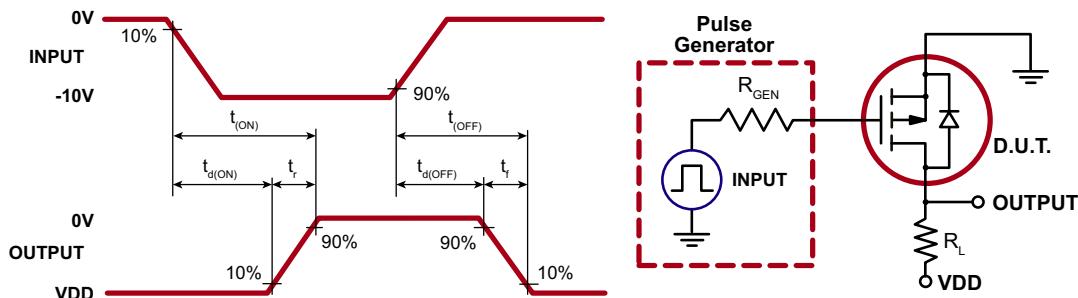
Electrical Characteristics ($T_A = 25^\circ\text{C}$ unless otherwise specified)

Sym	Parameter	Min	Typ	Max	Units	Conditions
BV_{DSS}	Drain-to-source breakdown voltage	-400	-	-	V	$V_{GS} = 0\text{V}$, $I_D = -2.0\text{mA}$
$V_{GS(\text{th})}$	Gate threshold voltage	-1.0	-	-2.4	V	$V_{GS} = V_{DS}$, $I_D = -1.0\text{mA}$
$\Delta V_{GS(\text{th})}$	Change in $V_{GS(\text{th})}$ with temperature	-	-	4.8	mV/ $^\circ\text{C}$	$V_{GS} = V_{DS}$, $I_D = -1.0\text{mA}$
I_{GSS}	Gate body leakage	-	-	-100	nA	$V_{GS} = \pm 20\text{V}$, $V_{DS} = 0\text{V}$
I_{DSS}	Zero gate voltage drain current	-	-	-10	μA	$V_{GS} = 0\text{V}$, $V_{DS} = \text{Max Rating}$
			-	-1.0	mA	$V_{DS} = 0.8 \text{ Max Rating}$, $V_{GS} = 0\text{V}$, $T_A = 125^\circ\text{C}$
$I_{D(\text{ON})}$	On-state drain current	-0.2	-0.3	-	A	$V_{GS} = -4.5\text{V}$, $V_{DS} = -25\text{V}$
		-0.4	-1.1	-		$V_{GS} = -10\text{V}$, $V_{DS} = -25\text{V}$
$R_{DS(\text{ON})}$	Static drain-to-source on-state resistance	-	20	30	Ω	$V_{GS} = -4.5\text{V}$, $I_D = -100\text{mA}$
			19	25		$V_{GS} = -10\text{V}$, $I_D = -100\text{mA}$
$\Delta R_{DS(\text{ON})}$	Change in $R_{DS(\text{ON})}$ with temperature	-	-	0.75	%/ $^\circ\text{C}$	$V_{GS} = -10\text{V}$, $I_D = -100\text{mA}$
G_{FS}	Forward transconductance	100	175	-	mmho	$V_{DS} = -25\text{V}$, $I_D = -100\text{mA}$
C_{ISS}	Input capacitance	-	60	125	pF	$V_{GS} = 0\text{V}$,
C_{OSS}	Common source output capacitance	-	20	70		$V_{DS} = -25\text{V}$,
C_{RSS}	Reverse transfer capacitance	-	10	25		$f = 1.0 \text{ MHz}$
$t_{d(\text{ON})}$	Turn-on delay time	-	-	10	ns	$V_{DD} = -25\text{V}$, $I_D = -0.4\text{A}$, $R_{GEN} = 25\Omega$
t_r	Rise time	-	-	10		
$t_{d(\text{OFF})}$	Turn-off delay time	-	-	20		
t_f	Fall time	-	-	13		
V_{SD}	Diode forward voltage drop	-	-	-1.8	V	$V_{GS} = 0\text{V}$, $I_{SD} = -100\text{mA}$
t_{fr}	Reverse recovery time	-	300	-	ns	$V_{GS} = 0\text{V}$, $I_{SD} = -100\text{mA}$

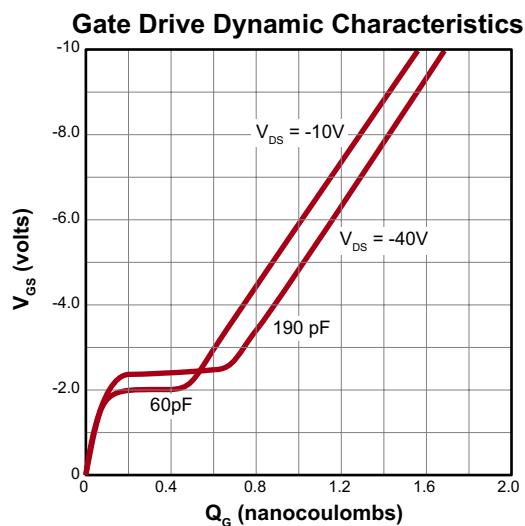
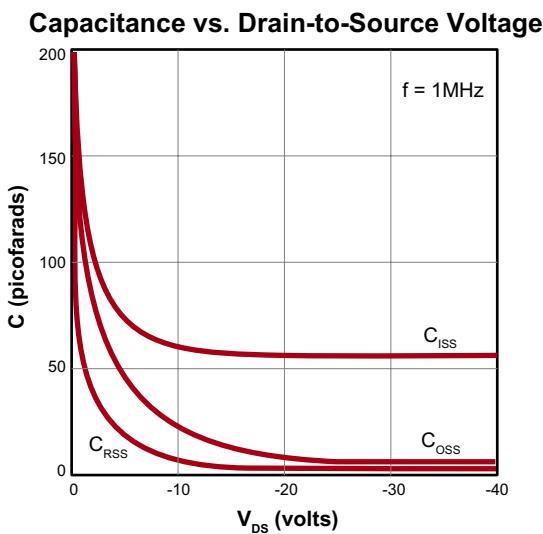
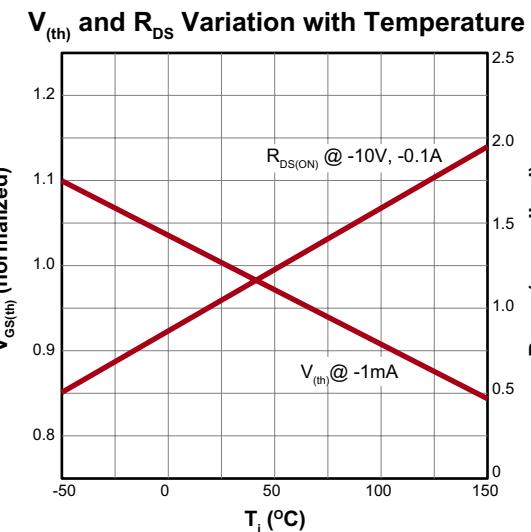
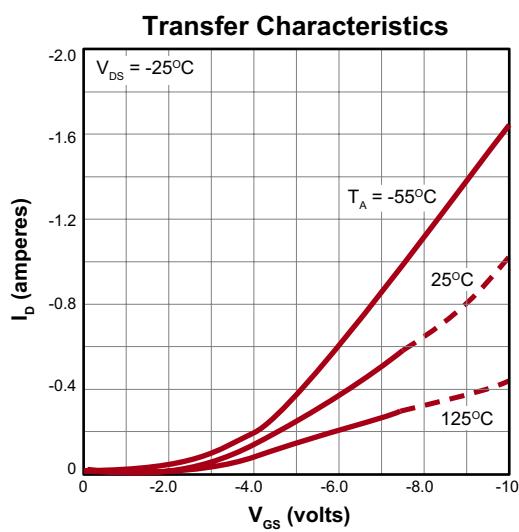
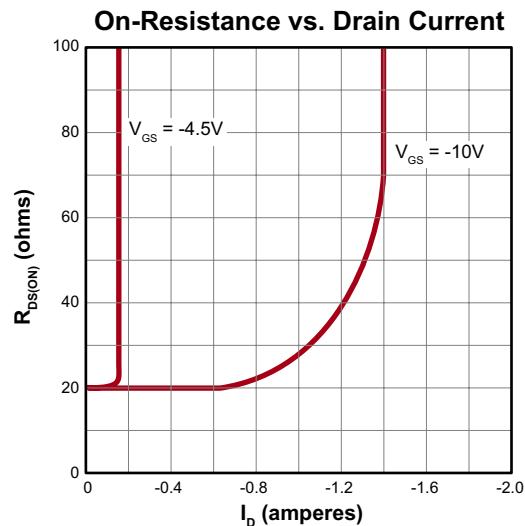
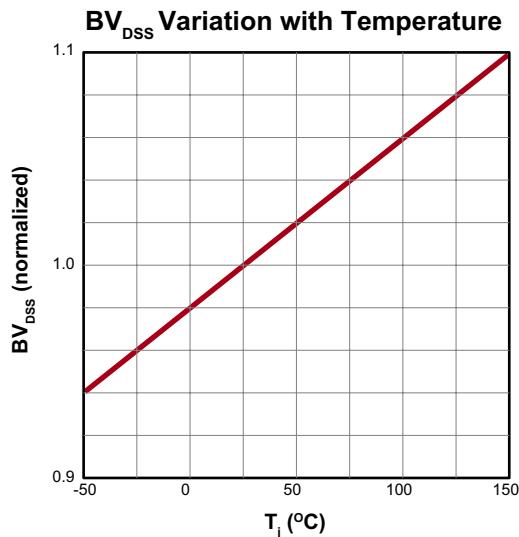
Notes:

- All D.C. parameters 100% tested at 25°C unless otherwise stated. (Pulse test: $300\mu\text{s}$ pulse, 2% duty cycle.)
- All A.C. parameters sample tested.

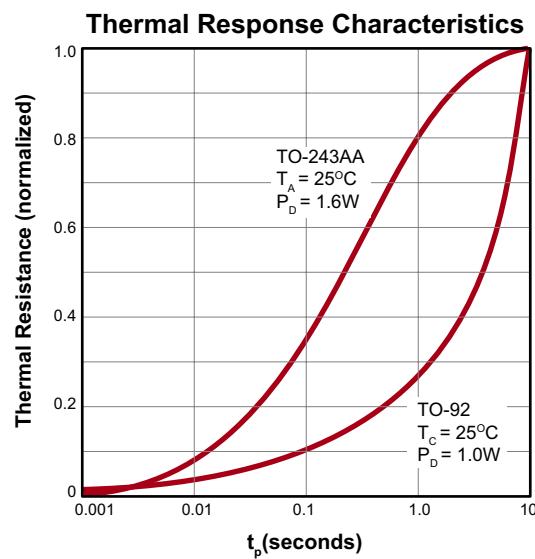
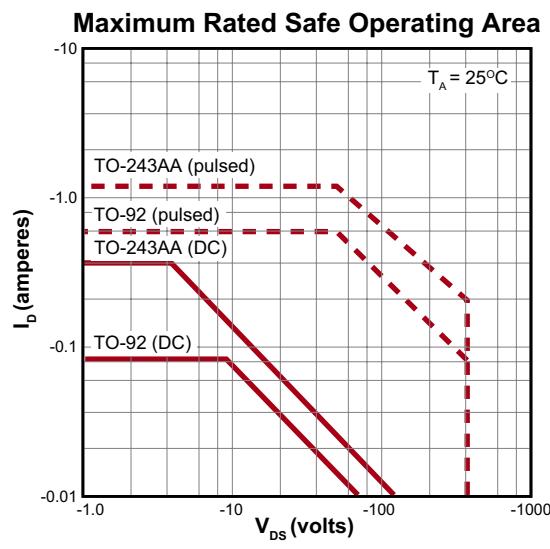
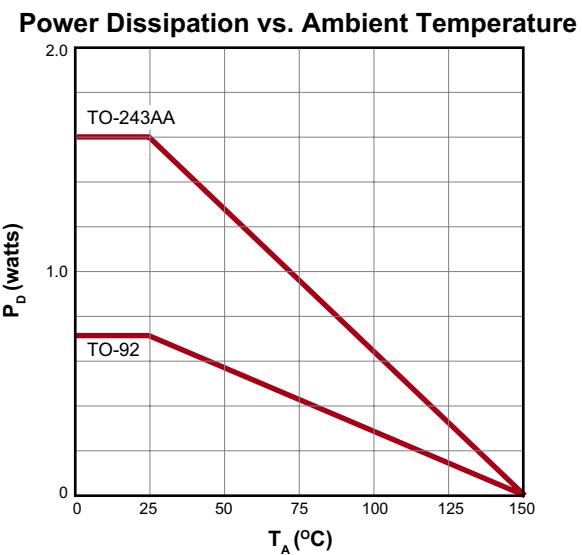
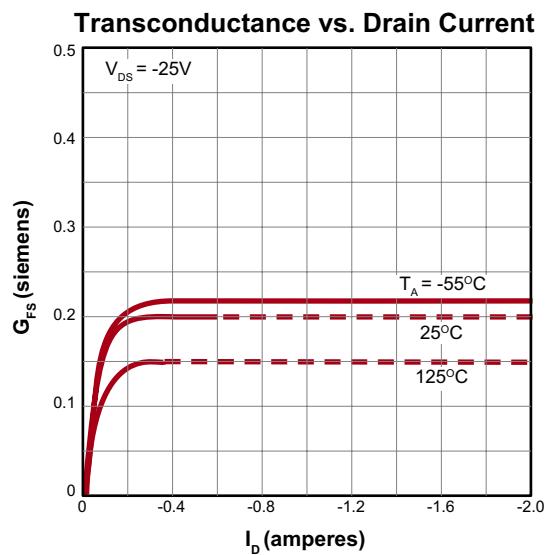
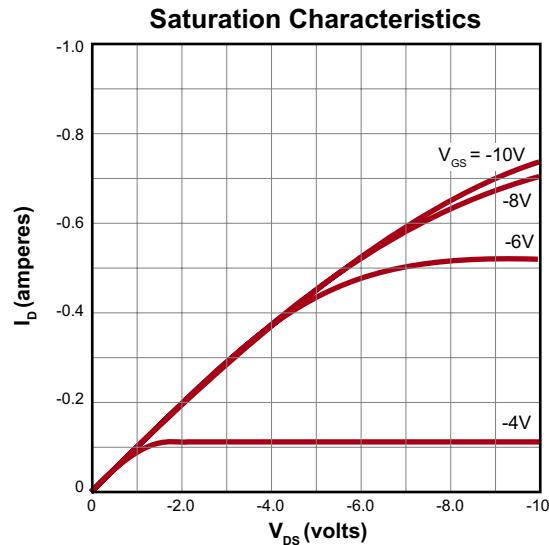
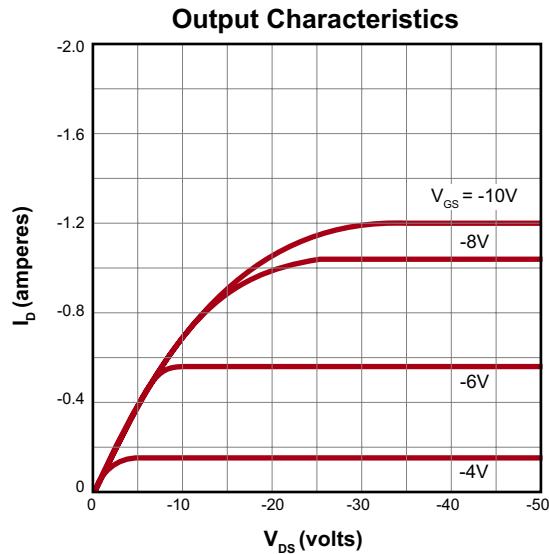
Switching Waveforms and Test Circuit



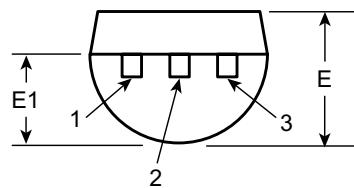
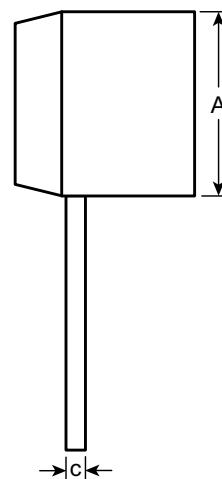
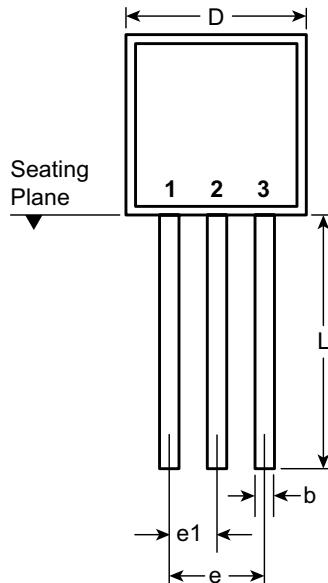
Typical Performance Curves



Typical Performance Curves (cont.)



3-Lead TO-92 Package Outline (N3)



Symbol		A	b	c	D	E	E1	e	e1	L
Dimensions (inches)	MIN	.170	.014 [†]	.014 [†]	.175	.125	.080	.095	.045	.500
	NOM	-	-	-	-	-	-	-	-	-
	MAX	.210	.022 [†]	.022 [†]	.205	.165	.105	.105	.055	.610*

JEDEC Registration TO-92.

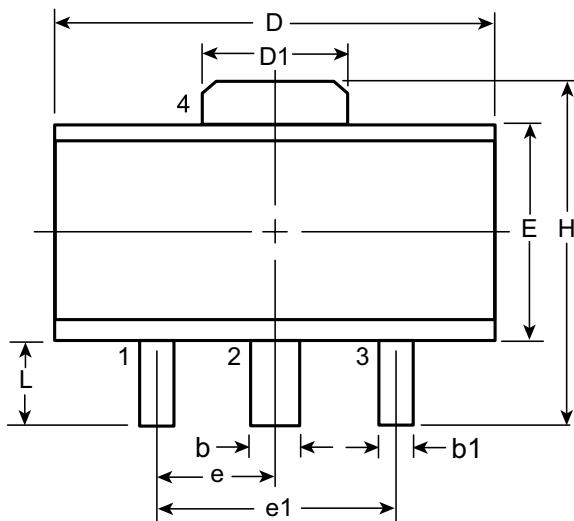
* This dimension is not specified in the JEDEC drawing.

† This dimension differs from the JEDEC drawing.

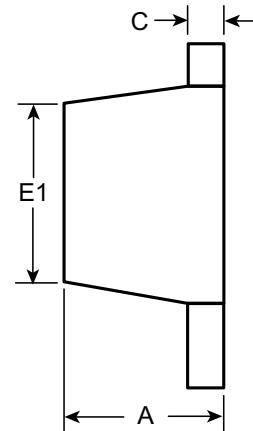
Drawings not to scale.

Supertex Doc.#: DSPD-3TO92N3, Version E041009.

3-Lead TO-243AA (SOT-89) Package Outline (N8)



Top View



Side View

Symbol	A	b	b1	C	D	D1	E	E1	e	e1	H	L	
Dimensions (mm)	MIN	1.40	0.44	0.36	0.35	4.40	1.62	2.29	2.00 ^t	1.50 BSC	3.00 BSC	3.94	0.73 ^t
	NOM	-	-	-	-	-	-	-	-			-	-
	MAX	1.60	0.56	0.48	0.44	4.60	1.83	2.60	2.29			4.25	1.20

JEDEC Registration TO-243, Variation AA, Issue C, July 1986.

^t This dimension differs from the JEDEC drawing

Drawings not to scale.

Supertex Doc. #: DSPD-3TO243AAN8, Version F111010.

(The package drawing(s) in this data sheet may not reflect the most current specifications. For the latest package outline information go to <http://www.supertex.com/packaging.html>.)

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ООО "ЛайфЭлектроникс"

"LifeElectronics" LLC

ИНН 7805602321 КПП 780501001 Р/С 40702810122510004610 ФАКБ "АБСОЛЮТ БАНК" (ЗАО) в г.Санкт-Петербурге К/С 30101810900000000703 БИК 044030703

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С конца 2013 года компания активно расширяет линейку поставок компонентов по направлению коаксиальный кабель, кварцевые генераторы и конденсаторы (керамические, пленочные, электролитические), за счёт заключения дистрибуторских договоров

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- Специальные условия для постоянных клиентов.
- Подбор аналогов.
- Поставку компонентов в любых объемах, удовлетворяющих вашим потребностям.
- Приемлемые сроки поставки, возможна ускоренная поставка.
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- Комплексную поставку.
- Работу по проектам и поставку образцов.
- Формирование склада под заказчика.
- Сертификаты соответствия на поставляемую продукцию (по желанию клиента).
- Тестирование поставляемой продукции.
- Поставку компонентов, требующих военную и космическую приемку.
- Входной контроль качества.
- Наличие сертификата ISO.

В составе нашей компании организован Конструкторский отдел, призванный помочь разработчикам, и инженерам.

Конструкторский отдел помогает осуществить:

- Регистрацию проекта у производителя компонентов.
- Техническую поддержку проекта.
- Защиту от снятия компонента с производства.
- Оценку стоимости проекта по компонентам.
- Изготовление тестовой платы монтаж и пусконаладочные работы.



Тел: +7 (812) 336 43 04 (многоканальный)
Email: org@lifeelectronics.ru