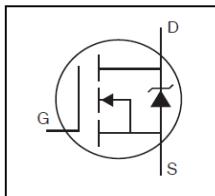


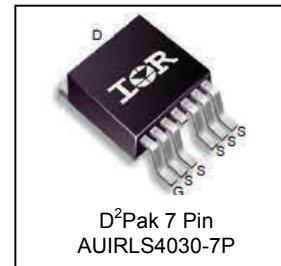
Features

- Optimized for Logic Level Drive
- Advanced Process Technology
- Ultra Low On-Resistance
- Logic Level Gate Drive
- 175°C Operating Temperature
- Fast Switching
- Repetitive Avalanche Allowed up to Tjmax
- Lead-Free, RoHS Compliant
- Automotive Qualified *



HEXFET® Power MOSFET

V_{DSS}	100V
$R_{DS(on)}$ typ.	3.2mΩ
	max. 3.9mΩ
I_D	190A



G	D	S
Gate	Drain	Source

Base Part Number	Package Type	Standard Pack		Orderable Part Number
		Form	Quantity	
AUIRLS4030-7P	D²Pak 7 Pin	Tube	50	AUIRLS4030-7P
		Tape and Reel Left	800	AUIRLS4030-7TRL

Absolute Maximum Ratings

Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only; and functional operation of the device at these or any other condition beyond those indicated in the specifications is not implied. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability. The thermal resistance and power dissipation ratings are measured under board mounted and still air conditions. Ambient temperature (TA) is 25°C, unless otherwise specified.

Symbol	Parameter	Max.	Units
I_D @ $T_C = 25^\circ\text{C}$	Continuous Drain Current, $V_{GS} @ 10\text{V}$	190	A
I_D @ $T_C = 100^\circ\text{C}$	Continuous Drain Current, $V_{GS} @ 10\text{V}$	130	
I_{DM}	Pulsed Drain Current ①	750	
P_D @ $T_C = 25^\circ\text{C}$	Maximum Power Dissipation	370	W
	Linear Derating Factor	2.5	W/ $^\circ\text{C}$
V_{GS}	Gate-to-Source Voltage	± 16	V
E_{AS}	Single Pulse Avalanche Energy (Thermally Limited) ②	320	mJ
I_{AR}	Avalanche Current ①	See Fig.14,15, 22a, 22b	A
E_{AR}	Repetitive Avalanche Energy ④		mJ
dv/dt	Peak Diode Recovery ③	13	V/ns
T_J	Operating Junction and	-55 to + 175	$^\circ\text{C}$
T_{STG}	Storage Temperature Range		
	Soldering Temperature, for 10 seconds (1.6mm from case)	300	

Thermal Resistance

Symbol	Parameter	Typ.	Max.	Units
$R_{\theta JC}$	Junction-to-Case ⑧⑨	—	0.40	$^\circ\text{C}/\text{W}$
$R_{\theta JA}$	Junction-to-Ambient ⑦	—	40	

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*Qualification standards can be found at www.infineon.com

Static @ $T_J = 25^\circ\text{C}$ (unless otherwise specified)

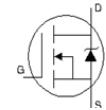
	Parameter	Min.	Typ.	Max.	Units	Conditions
$V_{(\text{BR})\text{DSS}}$	Drain-to-Source Breakdown Voltage	100	—	—	V	$V_{GS} = 0V, I_D = 250\mu\text{A}$
$\Delta V_{(\text{BR})\text{DSS}}/\Delta T_J$	Breakdown Voltage Temp. Coefficient	—	0.10	—	V/ $^\circ\text{C}$	Reference to $25^\circ\text{C}, I_D = 5\text{mA}$ ①
$R_{DS(\text{on})}$	Static Drain-to-Source On-Resistance	—	3.2	3.9	$\text{m}\Omega$	$V_{GS} = 10V, I_D = 110\text{A}$ ④
		—	3.3	4.1		$V_{GS} = 4.5V, I_D = 94\text{A}$ ④
$V_{GS(\text{th})}$	Gate Threshold Voltage	1.0	—	2.5	V	$V_{DS} = V_{GS}, I_D = 250\mu\text{A}$
gfs	Forward Trans conductance	250	—	—	S	$V_{DS} = 25V, I_D = 110\text{A}$
I_{DSS}	Drain-to-Source Leakage Current	—	—	20	μA	$V_{DS} = 100V, V_{GS} = 0V$
		—	—	250		$V_{DS} = 100V, V_{GS} = 0V, T_J = 125^\circ\text{C}$
I_{GSS}	Gate-to-Source Forward Leakage	—	—	100	nA	$V_{GS} = 16V$
	Gate-to-Source Reverse Leakage	—	—	-100		$V_{GS} = -16V$
R_G	Internal Gate Resistance	—	2.0	—	Ω	

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

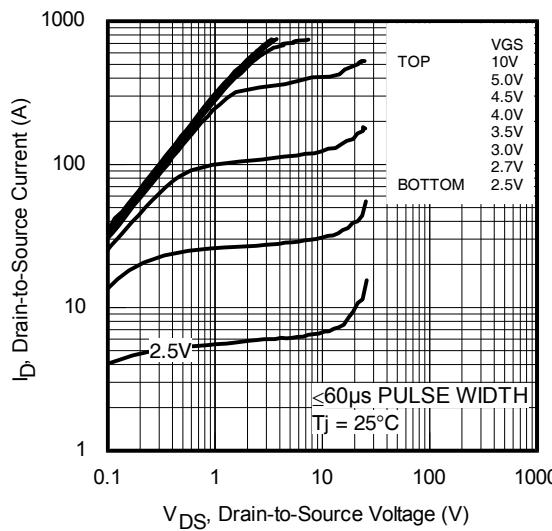
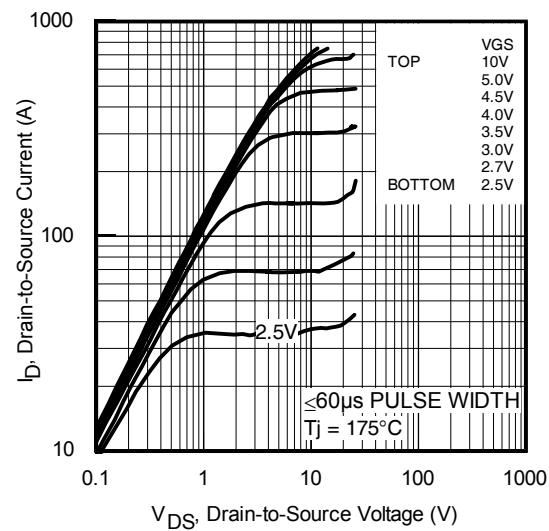
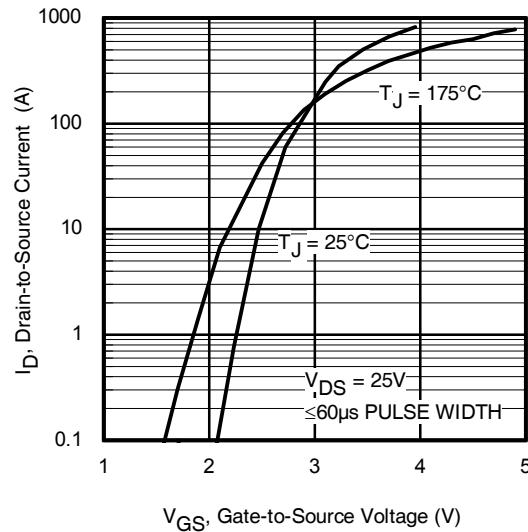
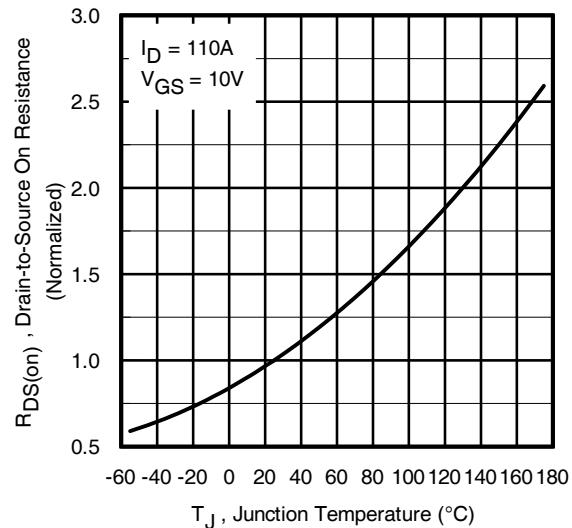
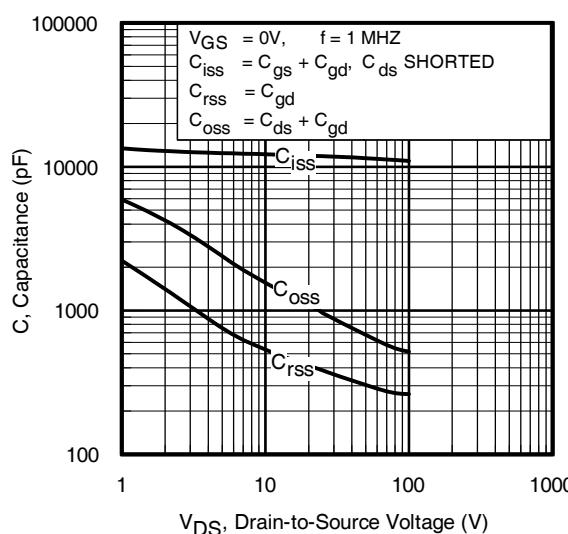
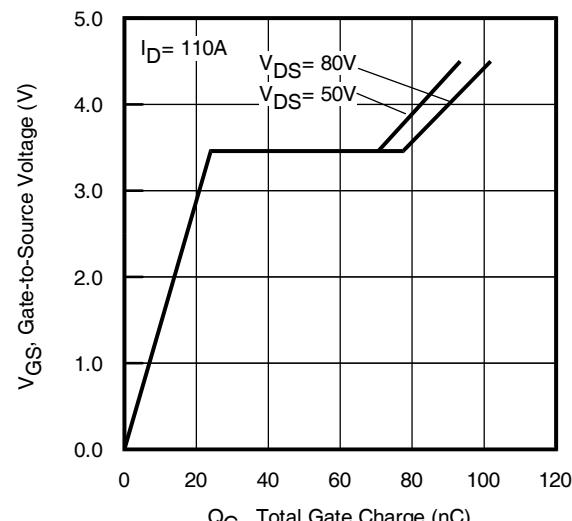
Q_g	Total Gate Charge	—	93	140	nC	$I_D = 110\text{A}$ $V_{DS} = 50V$ $V_{GS} = 4.5V$ ④
Q_{gs}	Gate-to-Source Charge	—	27	—		
Q_{gd}	Gate-to-Drain Charge	—	43	—		
Q_{sync}	Total Gate Charge Sync. ($Q_g - Q_{gd}$)	—	50	—		
$t_{d(on)}$	Turn-On Delay Time	—	53	—	ns	$V_{DD} = 65V$ $I_D = 110\text{A}$ $R_G = 2.7\Omega$ $V_{GS} = 4.5V$ ④
t_r	Rise Time	—	160	—		
$t_{d(off)}$	Turn-Off Delay Time	—	110	—		
t_f	Fall Time	—	87	—		
C_{iss}	Input Capacitance	—	11490	—	pF	$V_{GS} = 0V$ $V_{DS} = 50V$ $f = 1.0\text{MHz}$
C_{oss}	Output Capacitance	—	680	—		
C_{rss}	Reverse Transfer Capacitance	—	300	—		
$C_{oss \text{ eff. (ER)}}$	Effective Output Capacitance (Energy Related)	—	760	—		$V_{GS} = 0V, V_{DS} = 0V \text{ to } 80V$ ⑥
$C_{oss \text{ eff. (TR)}}$	Effective Output Capacitance (Time Related)	—	1170	—		$V_{GS} = 0V, V_{DS} = 0V \text{ to } 80V$ ⑤

Diode Characteristics

	Parameter	Min.	Typ.	Max.	Units	Conditions
I_s	Continuous Source Current (Body Diode)	—	—	190	A	MOSFET symbol showing the integral reverse p-n junction diode.
I_{SM}	Pulsed Source Current (Body Diode) ①	—	—	750		
V_{SD}	Diode Forward Voltage	—	—	1.3	V	$T_J = 25^\circ\text{C}, I_s = 110\text{A}, V_{GS} = 0V$ ④
t_{rr}	Reverse Recovery Time	—	53	—	ns	$T_J = 25^\circ\text{C}$ $V_{DD} = 85V$
		—	63	—		$T_J = 125^\circ\text{C}$ $I_F = 110\text{A}$
Q_{rr}	Reverse Recovery Charge	—	99	—	nC	$T_J = 25^\circ\text{C}$ $di/dt = 100\text{A}/\mu\text{s}$ ④
		—	155	—		$T_J = 125^\circ\text{C}$
I_{RRM}	Reverse Recovery Current	—	3.3	—	A	$T_J = 25^\circ\text{C}$
t_{on}	Forward Turn-On Time	Intrinsic turn-on time is negligible (turn-on is dominated by $L_S + L_D$)				


Notes:

- ① Repetitive rating; pulse width limited by max. junction temperature.
- ② Limited by $T_{J\text{max}}$, starting $T_J = 25^\circ\text{C}$, $L = 0.05\text{mH}$, $R_G = 25\Omega$, $I_{AS} = 110\text{A}$, $V_{GS} = 10V$. Part not recommended for use above this value.
- ③ $I_{SD} \leq 110\text{A}$, $di/dt \leq 1520\text{A}/\mu\text{s}$, $V_{DD} \leq V_{(\text{BR})\text{DSS}}$, $T_J \leq 175^\circ\text{C}$.
- ④ Pulse width $\leq 400\mu\text{s}$; duty cycle $\leq 2\%$.
- ⑤ $C_{oss \text{ eff. (TR)}}$ is a fixed capacitance that gives the same charging time as C_{oss} while V_{DS} is rising from 0 to 80% V_{DSS} .
- ⑥ $C_{oss \text{ eff. (ER)}}$ is a fixed capacitance that gives the same energy as C_{oss} while V_{DS} is rising from 0 to 80% V_{DSS} .
- ⑦ When mounted on 1" square PCB (FR-4 or G-10 Material). For recommended footprint and soldering techniques refer to application note #AN-994
- ⑧ R_θ is measured at T_J approximately 90°C .
- ⑨ $R_{\theta\text{JC}}$ value shown is at time zero.


Fig. 1 Typical Output Characteristics

Fig. 2 Typical Output Characteristics

Fig. 3 Typical Transfer Characteristics

Fig. 4 Normalized On-Resistance vs. Temperature

Fig 5. Typical Capacitance vs. Drain-to-Source Voltage

Fig 6. Typical Gate Charge vs. Gate-to-Source Voltage

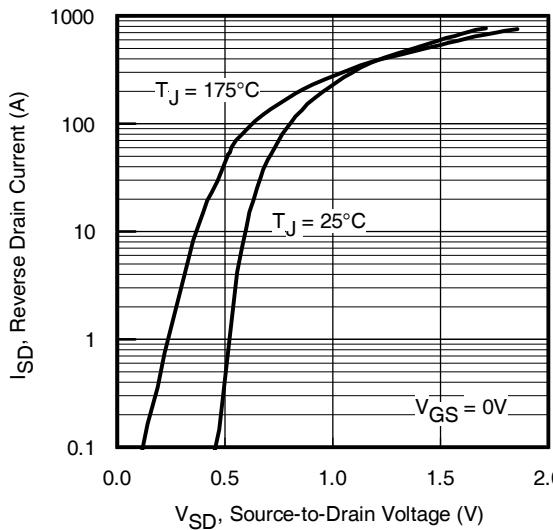


Fig. 7 Typical Source-to-Drain Diode Forward Voltage

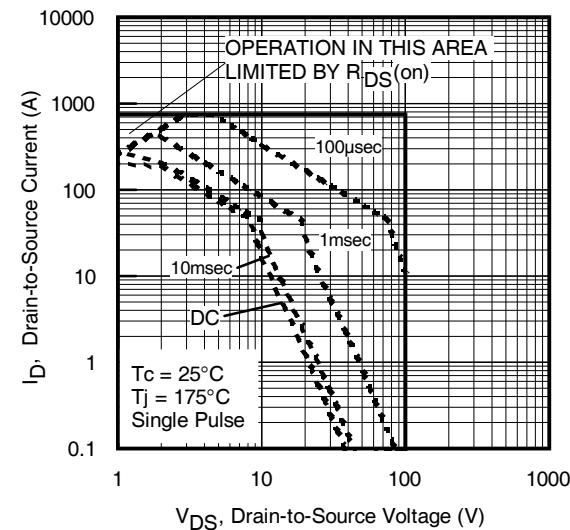


Fig 8. Maximum Safe Operating Area

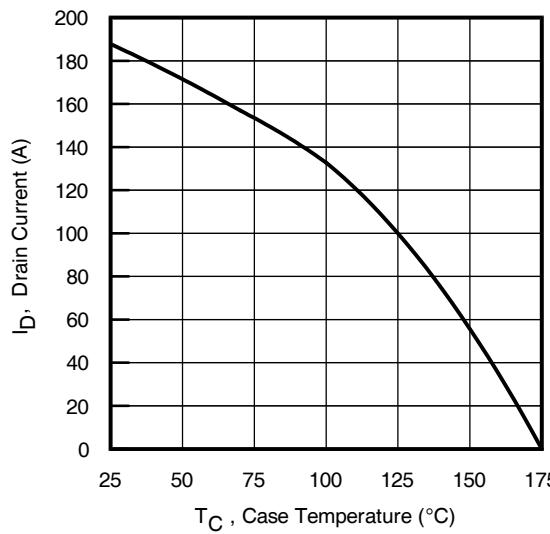


Fig 9. Maximum Drain Current vs. Case Temperature

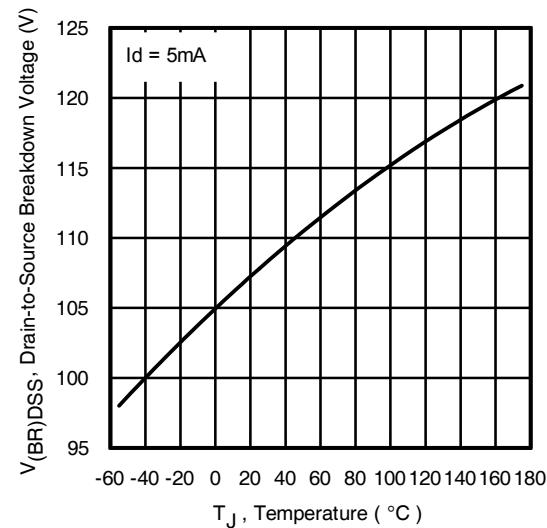


Fig 10. Drain-to-Source Breakdown Voltage

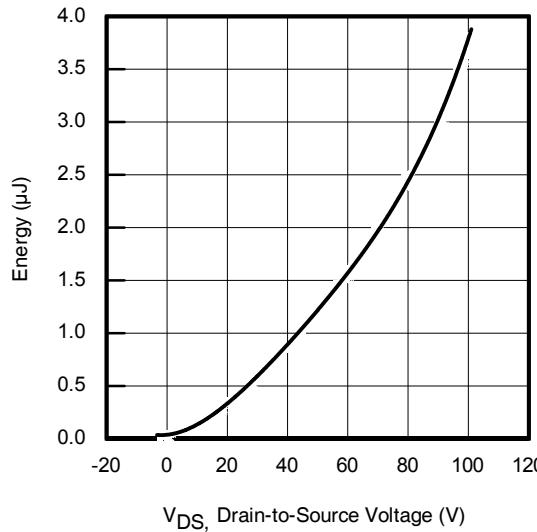


Fig 11. Typical Coss Stored Energy

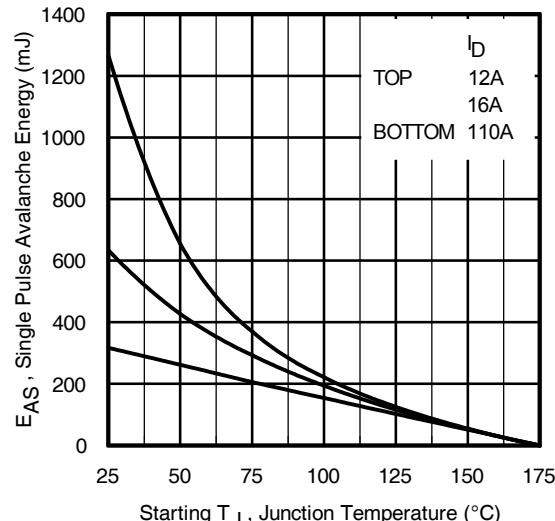


Fig 12. Maximum Avalanche Energy vs. Drain Current

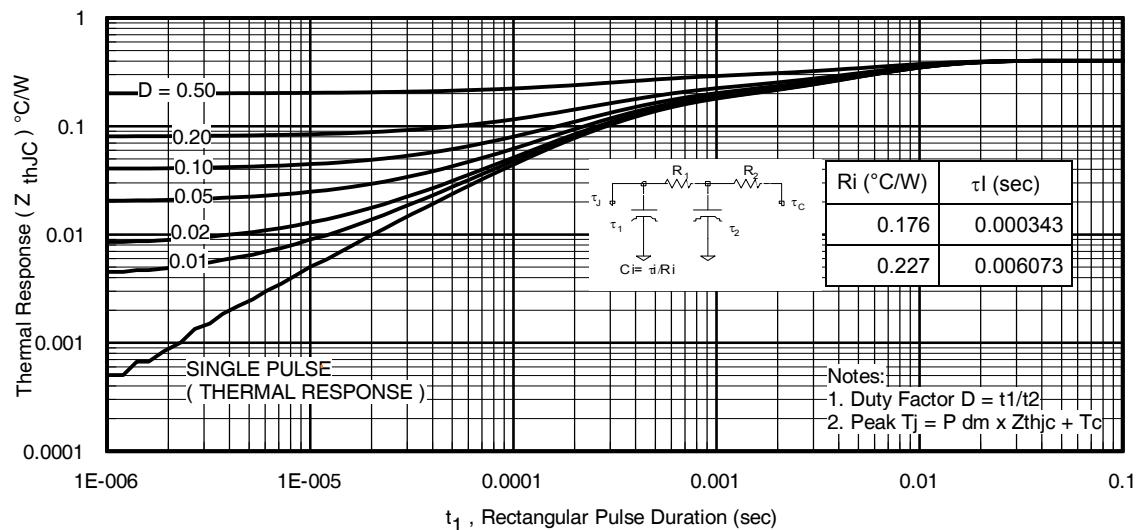


Fig 13. Maximum Effective Transient Thermal Impedance, Junction-to-Case

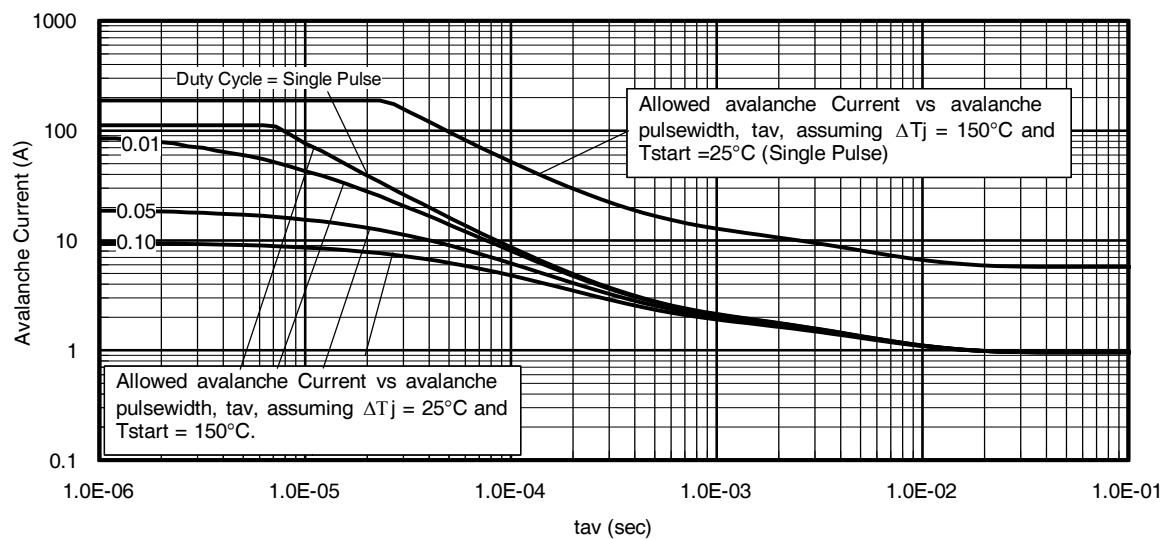


Fig 14. Avalanche Current vs. Pulse width

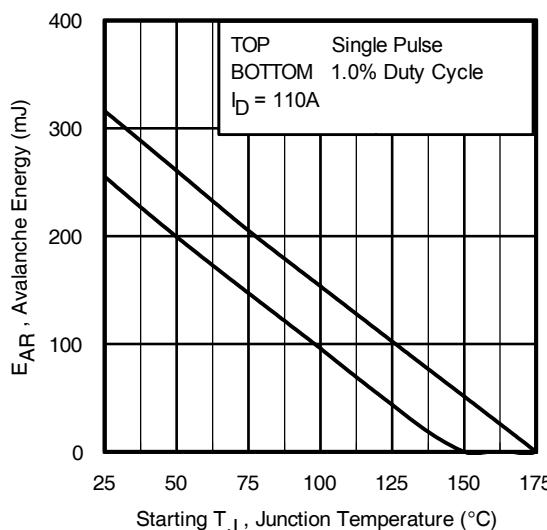


Fig 15. Maximum Avalanche Energy vs. Temperature

Notes on Repetitive Avalanche Curves , Figures 14, 15:

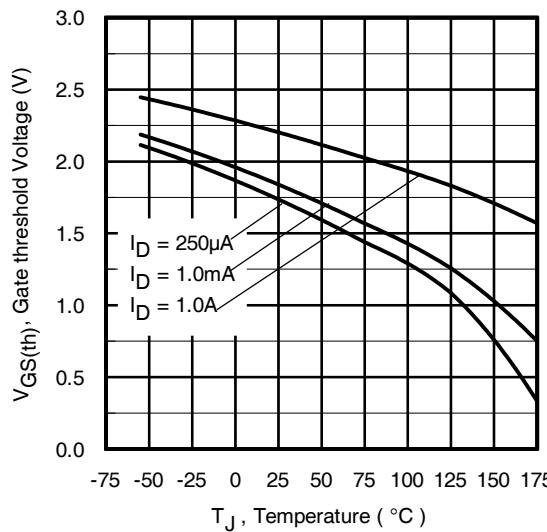
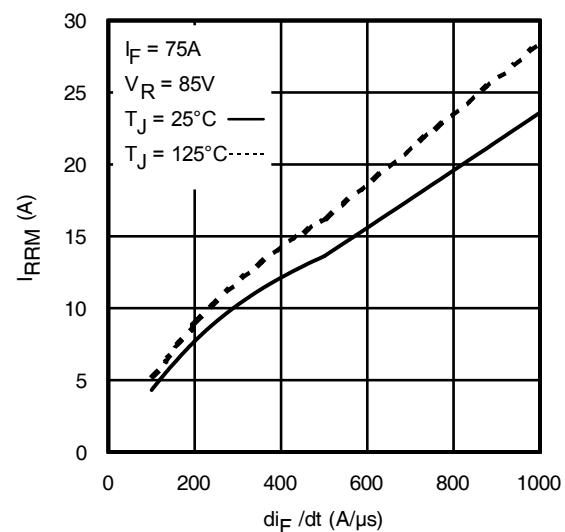
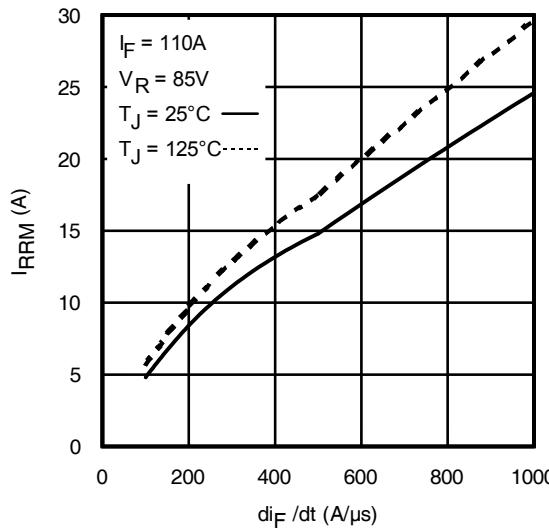
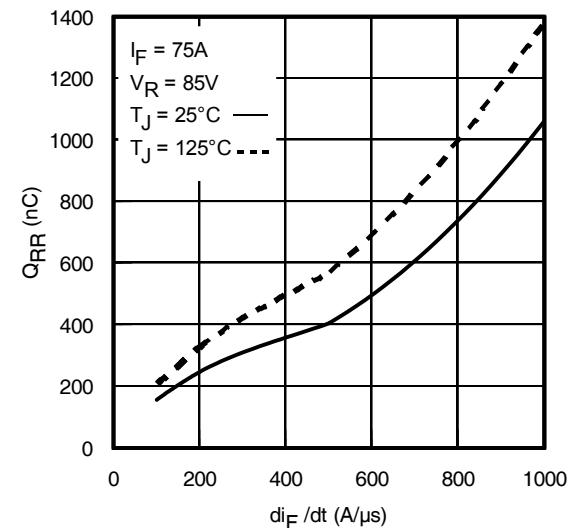
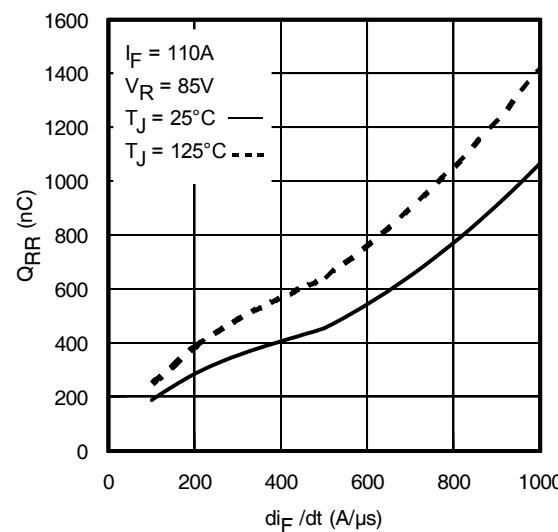
(For further info, see AN-1005 at www.infineon.com)

1. Avalanche failures assumption:
Purely a thermal phenomenon and failure occurs at a temperature far in excess of T_{jmax} . This is validated for every part type.
 2. Safe operation in Avalanche is allowed as long as T_{jmax} is not exceeded.
 3. Equation below based on circuit and waveforms shown in Figures 18a, 18b.
 4. $P_{D(ave)}$ = Average power dissipation per single avalanche pulse.
 5. BV = Rated breakdown voltage (1.3 factor accounts for voltage increase during avalanche).
 6. I_{av} = Allowable avalanche current.
 7. ΔT = Allowable rise in junction temperature, not to exceed T_{jmax} (assumed as 25°C in Figure 13, 14).
- t_{av} = Average time in avalanche.
 D = Duty cycle in avalanche = t_{av}/f
 $Z_{thJC}(D, t_{av})$ = Transient thermal resistance, see Figures 13)

$$P_{D(ave)} = 1/2 (1.3 \cdot BV \cdot I_{av}) = \Delta T / Z_{thJC}$$

$$I_{av} = 2\Delta T / [1.3 \cdot BV \cdot Z_{th}]$$

$$E_{AS(AR)} = P_{D(ave)} \cdot t_{av}$$


Fig. 16. Threshold Voltage vs. Temperature

Fig. 17 - Typical Recovery Current vs. di_F/dt

Fig. 18 - Typical Recovery Current vs. di_F/dt

Fig. 19 - Typical Stored Charge vs. di_F/dt

Fig. 20 - Typical Stored Charge vs. di_F/dt

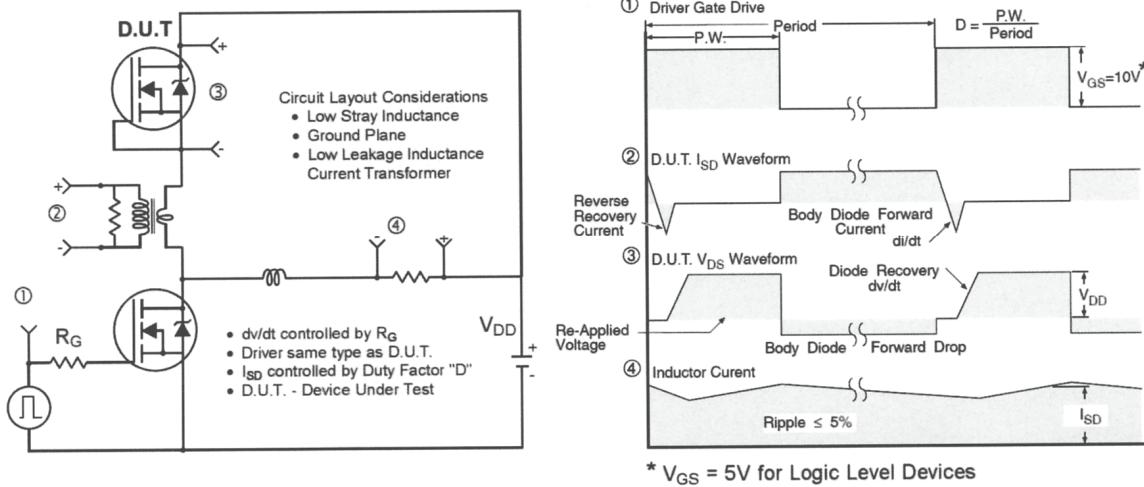


Fig 21. Peak Diode Recovery dv/dt Test Circuit for N-Channel HEXFET® Power MOSFETs

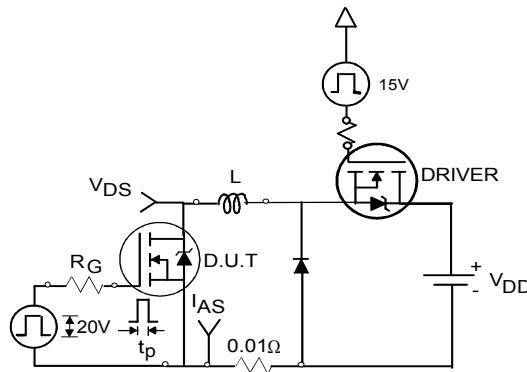


Fig 22a. Unclamped Inductive Test Circuit

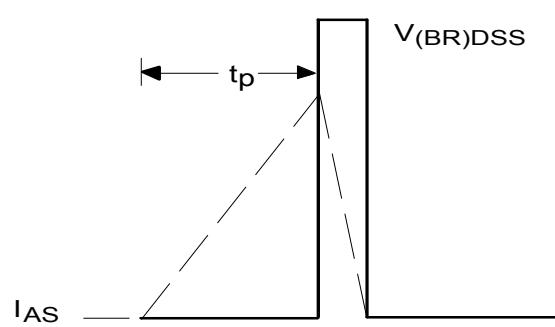


Fig 22b. Unclamped Inductive Waveforms

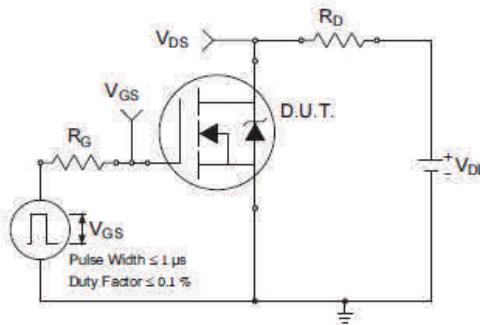


Fig 23a. Switching Time Test Circuit

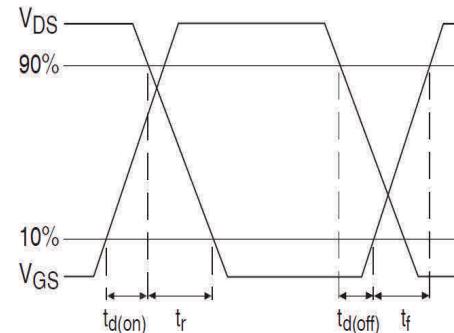


Fig 23b. Switching Time Waveforms

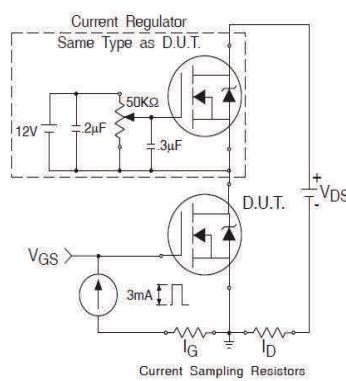


Fig 24a. Gate Charge Test Circuit

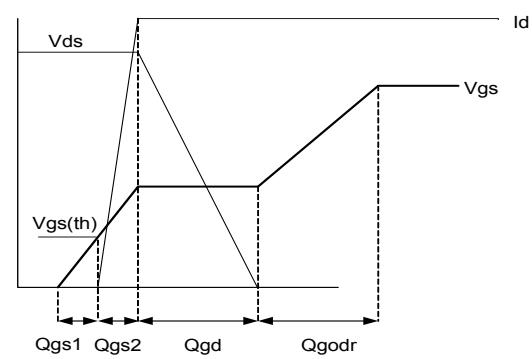
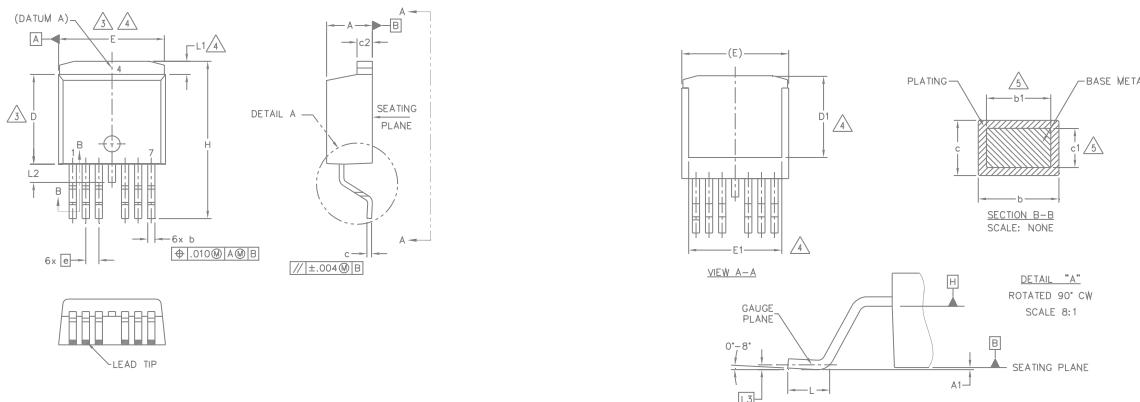


Fig 24b. Gate Charge Waveform

D²Pak - 7 Pin Package Outline (Dimensions are shown in millimeters (inches))

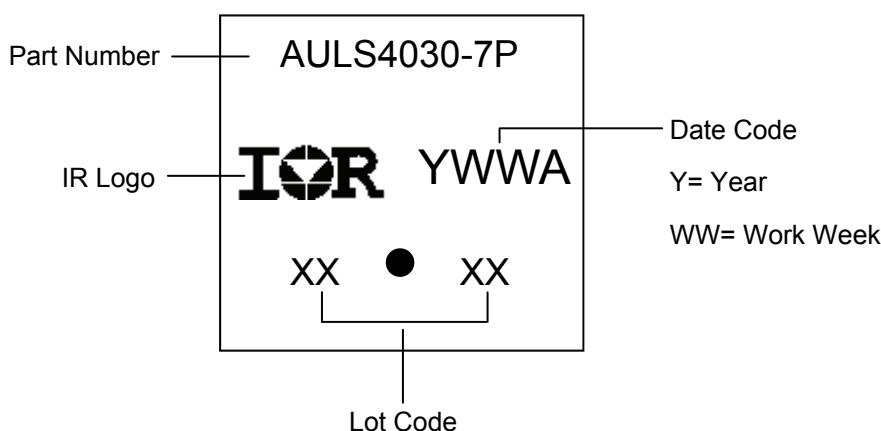


S Y M B O L	DIMENSIONS				N O T E S	
	MILLIMETERS		INCHES			
	MIN.	MAX.	MIN.	MAX.		
A	4.06	4.83	.160	.190		
A1	—	0.254	—	.010		
b	0.51	0.99	.020	.036	5	
b1	0.51	0.89	.020	.032		
c	0.38	0.74	.015	.029		
c1	0.38	0.58	.015	.023		
c2	1.14	1.65	.045	.065		
D	8.38	9.65	.330	.380	3	
D1	6.86	7.42	.270	.292		
E	9.65	10.54	.380	.415		
E1	6.22	8.48	.245	.334		
e	1.27 BSC		.050 BSC		4	
H	14.61	15.88	.575	.625		
L	1.78	2.79	.070	.110		
L1	—	1.68	—	.066		
L2	—	1.78	—	.070	4	
L3	0.25 BSC		.010 BSC			

NOTES:

1. DIMENSIONING AND TOLERANCING AS PER ASME Y14.5M-1994
2. DIMENSIONS ARE SHOWN IN MILLIMETERS [INCHES].
3. DIMENSION D & E DO NOT INCLUDE MOLD FLASH. MOLD FLASH SHALL NOT EXCEED 0.127 [.005"] PER SIDE. THESE DIMENSIONS ARE MEASURED AT THE OUTMOST EXTREMES OF THE PLASTIC BODY AT DATUM H.
4. THERMAL PAD CONTOUR OPTIONAL WITHIN DIMENSION E, L1, D1 & E1.
5. DIMENSION b1 AND c1 APPLY TO BASE METAL ONLY.
6. DATUM A & B TO BE DETERMINED AT DATUM PLANE H.
7. CONTROLLING DIMENSION: INCH.
8. OUTLINE CONFORMS TO JEDEC OUTLINE TO-263CB.
EXCEPT FOR DIMS. E, E1 & D1.

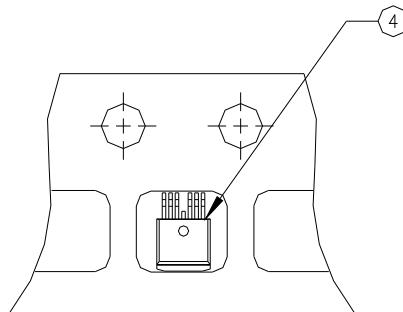
D²Pak - 7 Pin Part Marking Information



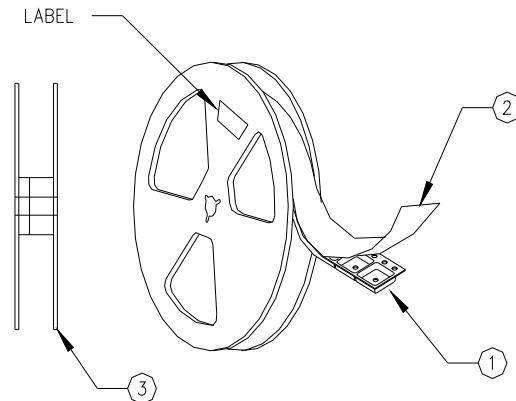
D²Pak - 7 Pin Tape and Reel

NOTES, TAPE & REEL, LABELLING:

1. TAPE AND REEL.
 - 1.1 REEL SIZE 13 INCH DIAMETER.
 - 1.2 EACH REEL CONTAINING 800 DEVICES.
 - 1.3 THERE SHALL BE A MINIMUM OF 42 SEALED POCKETS CONTAINED IN THE LEADER AND A MINIMUM OF 15 SEALED POCKETS IN THE TRAILER.
 - 1.4 PEEL STRENGTH MUST CONFORM TO THE SPEC. NO. 71-9667.
 - 1.5 PART ORIENTATION SHALL BE AS SHOWN BELOW.
 - 1.6 REEL MAY CONTAIN A MAXIMUM OF TWO UNIQUE LOT CODE/DATE CODE COMBINATIONS. REWORKED REELS MAY CONTAIN A MAXIMUM OF THREE UNIQUE LOT CODE/DATE CODE COMBINATIONS. HOWEVER, THE LOT CODES AND DATE CODES WITH THEIR RESPECTIVE QUANTITIES SHALL APPEAR ON THE BAR CODE LABEL FOR THE AFFECTED REEL.



2. LABELLING (REEL AND SHIPPING BAG).
 - 2.1 CUST. PART NUMBER (BAR CODE): IRFXXXXSTRL-7P
 - 2.2 CUST. PART NUMBER (TEXT CODE): IRFXXXXSTRL-7P
 - 2.3 I.R. PART NUMBER: IRFXXXXSTRL-7P
 - 2.4 QUANTITY:
 - 2.5 VENDOR CODE: IR
 - 2.6 LOT CODE:
 - 2.7 DATE CODE:



Qualification Information

		Automotive (per AEC-Q101)	
Qualification Level		Comments: This part number(s) passed Automotive qualification. Infineon's Industrial and Consumer qualification level is granted by extension of the higher Automotive level.	
Moisture Sensitivity Level		D ² -Pak 7 Pin	MSL1
ESD	Machine Model	Class M4 (+/- 800V) [†] AEC-Q101-002	
	Human Body Model	Class H3A (+/- 6000V) [†] AEC-Q101-001	
	Charged Device Model	Class C5 (+/- 2000V) [†] AEC-Q101-005	
RoHS Compliant		Yes	

[†] Highest passing voltage.

Revision History

Date	Comments
03/03/2014	<ul style="list-style-type: none"> Added "Logic Level Gate Drive" bullet in the features section on page 1 Updated data sheet with new IR corporate template
04/02/2014	<ul style="list-style-type: none"> Updated package outline and part marking on page 8 & 9 Updated typo on the fig.19 and fig.20, unit of y-axis from "A" to "nC" on page 6.
11/06/2015	<ul style="list-style-type: none"> Updated datasheet with corporate template Corrected ordering table on page 1.
10/10/2017	<ul style="list-style-type: none"> Corrected typo error on part marking on page 8.

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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, помошь 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 помошь 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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