

APÉNDICE D

Hojas técnicas

D.1.- Hojas técnicas de los MOSFET de potencia

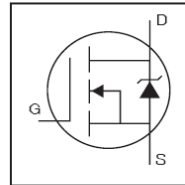
International
IR Rectifier

PD - 91309B

IRF3710

HEXFET® Power MOSFET

- Advanced Process Technology
- Ultra Low On-Resistance
- Dynamic dv/dt Rating
- 175°C Operating Temperature
- Fast Switching
- Fully Avalanche Rated

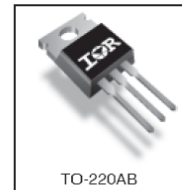


$V_{DS} = 100V$
 $R_{DS(on)} = 23m\Omega$
 $I_D = 57A$

Description

Advanced HEXFET® Power MOSFETs from International Rectifier utilize advanced processing techniques to achieve extremely low on-resistance per silicon area. This benefit, combined with the fast switching speed and ruggedized device design that HEXFET power MOSFETs are well known for, provides the designer with an extremely efficient and reliable device for use in a wide variety of applications.

The TO-220 package is universally preferred for all commercial-industrial applications at power dissipation levels to approximately 50 watts. The low thermal resistance and low package cost of the TO-220 contribute to its wide acceptance throughout the industry.



Absolute Maximum Ratings

Parameter	Max.	Units
$I_D @ T_C = 25^\circ C$	57	A
$I_D @ T_C = 100^\circ C$	40	
I_{DM}	230	
$P_D @ T_C = 25^\circ C$	200	W
	1.3	W/°C
V_{GS}	± 20	V
I_{AR}	28	A
E_{AR}	20	mJ
dv/dt	5.8	V/ns
T_J	-55 to +175	°C
T_{STG}		
	300 (1.6mm from case) 10 lbf•in (1.1N•m)	

Thermal Resistance

Parameter	Typ.	Max.	Units
$R_{\theta JC}$	—	0.75	°C/W
$R_{\theta CS}$	0.50	—	
$R_{\theta JA}$	—	62	

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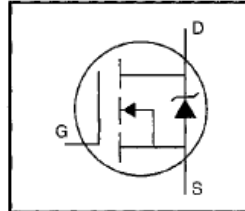


PD-9.527B

IRF644

HEXFET® Power MOSFET

- Dynamic dv/dt Rating
- Repetitive Avalanche Rated
- Fast Switching
- Ease of Paralleling
- Simple Drive Requirements

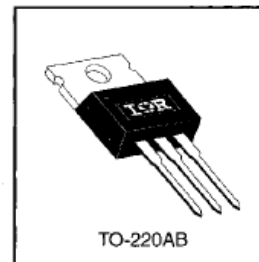


$V_{DSS} = 250V$
$R_{DS(on)} = 0.28\Omega$
$I_D = 14A$

Description

Third Generation HEXFETs from International Rectifier provide the designer with the best combination of fast switching, ruggedized device design, low on-resistance and cost-effectiveness.

The TO-220 package is universally preferred for all commercial-industrial applications at power dissipation levels to approximately 50 watts. The low thermal resistance and low package cost of the TO-220 contribute to its wide acceptance throughout the industry.



DATA SHEETS

Absolute Maximum Ratings

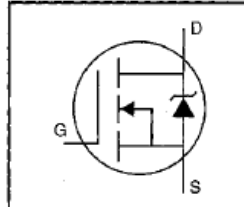
Parameter	Max.	Units
$I_D @ T_C = 25^\circ C$	14	A
$I_D @ T_C = 100^\circ C$	8.5	
I_{DM}	56	
$P_D @ T_C = 25^\circ C$	125	W
	1.0	W/°C
V_{GS}	±20	V
E_{AS}	550	mJ
I_{AR}	14	A
E_{AR}	13	mJ
dv/dt	4.8	V/ns
T_J	-55 to +150	°C
T_{STG}		
	300 (1.6mm from case)	
	10 lbf·in (1.1 N·m)	

Thermal Resistance

Parameter	Min.	Typ.	Max.	Units
$R_{\theta JC}$	—	—	1.0	°C/W
$R_{\theta CS}$	—	0.50	—	
$R_{\theta JA}$	—	—	62	

HEXFET® Power MOSFET

- Dynamic dv/dt Rating
- Repetitive Avalanche Rated
- Fast Switching
- Ease of Paralleling
- Simple Drive Requirements

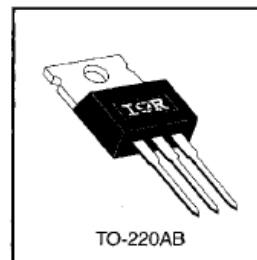


$V_{DSS} = 400V$
$R_{DS(on)} = 0.55\Omega$
$I_D = 10A$

Description

Third Generation HEXFETs from International Rectifier provide the designer with the best combination of fast switching, ruggedized device design, low on-resistance and cost-effectiveness.

The TO-220 package is universally preferred for all commercial-industrial applications at power dissipation levels to approximately 50 watts. The low thermal resistance and low package cost of the TO-220 contribute to its wide acceptance throughout the industry.



DATA SHEETS

Absolute Maximum Ratings

Parameter	Max.	Units
$I_D @ T_C = 25^\circ C$	10	A
$I_D @ T_C = 100^\circ C$	6.3	
I_{DM}	40	
$P_D @ T_C = 25^\circ C$	125	W
	1.0	W/°C
V_{GS}	± 20	V
E_{AS}	520	mJ
I_{AR}	10	A
E_{AR}	13	mJ
dv/dt	4.0	V/ns
T_J	-55 to +150	°C
T_{STG}		
	300 (1.6mm from case)	
	10 lbf·in (1.1 N·m)	

Thermal Resistance

Parameter	Min.	Typ.	Max.	Units
$R_{\theta JC}$	—	—	1.0	°C/W
$R_{\theta CS}$	—	0.50	—	
$R_{\theta JA}$	—	—	62	

D.2.- Hojas técnicas de los diodos de recuperación rápida

**MUR3020PT, MUR3040PT,
MUR3060PT**

**SWITCHMODE™
Power Rectifiers**

... designed for use in switching power supplies, inverters and as free wheeling diodes, these state-of-the-art devices have the following features:

- Ultrafast 35 and 60 Nanosecond Recovery Time
- 175°C Operating Junction Temperature
- High Voltage Capability to 600 Volts
- Low Forward Drop
- Low Leakage Specified @ 150°C Case Temperature
- Current Derating Specified @ Both Case and Ambient Temperatures
- Epoxy Meets UL94, V₀ @ 1/8"
- High Temperature Glass Passivated Junction

Mechanical Characteristics:

- Case: Epoxy, Molded
- Weight: 4.3 grams (approximately)
- Finish: All External Surfaces Corrosion Resistant and Terminal Leads are Readily Solderable
- Lead Temperature for Soldering Purposes: 260°C Max. for 10 Seconds
- Shipped 30 units per plastic tube
- Marking: U3020, U3040, U3060

MAXIMUM RATINGS

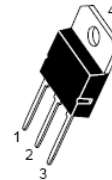
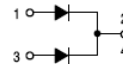
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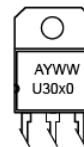
<http://onsemi.com>

**ULTRAFAST
RECTIFIERS
30 AMPERES
200–600 VOLTS**



TO-218AC
CASE 340D
STYLE 2

MARKING DIAGRAM



- A = Assembly Location
- Y = Year
- WW = Work Week
- U30x0 = Device Code
- x = 2, 4 or 6

ORDERING INFORMATION

Device	Package	Shipping
MUR3020PT	SOT-93	30 Units/Rail
MUR3040PT	SOT-93	30 Units/Rail
MUR3060PT	SOT-93	30 Units/Rail



MUR840, MUR860, RURP840, RURP860

Data Sheet

January 2002

8A, 400V - 600V Ultrafast Diodes

The MUR840, MUR860, RURP840 and RURP860 are low forward voltage drop ultrafast recovery rectifiers ($t_{rr} < 60\text{ns}$). They use a glass-passivated ion-implanted, epitaxial construction.

These devices are intended for use as output rectifiers and flywheel diodes in a variety of high-frequency pulse-width modulated switching regulators. Their low stored charge and attendant fast reverse-recovery behavior minimize electrical noise generation and in many circuits markedly reduce the turn-on dissipation of the associated power switching transistors.

Formerly developmental type TA09616.

Ordering Information

PART NUMBER	PACKAGE	BRAND
MUR840	TO-220AC	MUR840
RURP840	TO-220AC	RURP840
MUR860	TO-220AC	MUR860
RURP860	TO-220AC	RURP860

NOTE: When ordering, use the entire part number.

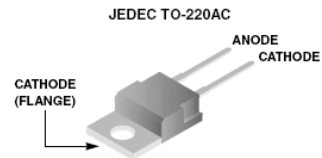
Features

- Ultrafast with Soft Recovery <60ns
- Operating Temperature 175°C
- Reverse Voltage 600V
- Avalanche Energy Rated
- Planar Construction

Applications

- Switching Power Supplies
- Power Switching Circuits
- General Purpose

Packaging



Symbol



Absolute Maximum Ratings $T_C = 25^\circ\text{C}$, Unless Otherwise Specified

	MUR840 RURP840	MUR860 RURP860	UNITS
Peak Repetitive Reverse Voltage V_{RRM}	400	600	V
Working Peak Reverse Voltage V_{RWM}	400	600	V
DC Blocking Voltage V_R	400	600	V
Average Rectified Forward Current $I_F(AV)$ ($T_C = 155^\circ\text{C}$)	8	8	A
Repetitive Peak Surge Current I_{FRM} (Square Wave, 20kHz)	16	16	A
Nonrepetitive Peak Surge Current I_{FSM} (Halfwave, 1 Phase, 60Hz)	100	100	A
Maximum Power Dissipation P_D	75	75	W
Avalanche Energy (See Figures 10 and 11) E_{AVL}	20	20	mJ
Operating and Storage Temperature T_{STG}, T_J	-65 to 175	-65 to 175	°C
Maximum Lead Temperature for Soldering			
Leads at 0.063 in. (1.6mm) from case for 10s T_L	300	300	°C
Package Body for 10s, see Tech Brief 334. T_{PKG}	260	260	°C

D.3.- Hojas técnicas de los núcleos de ferrita

Ferroxcube

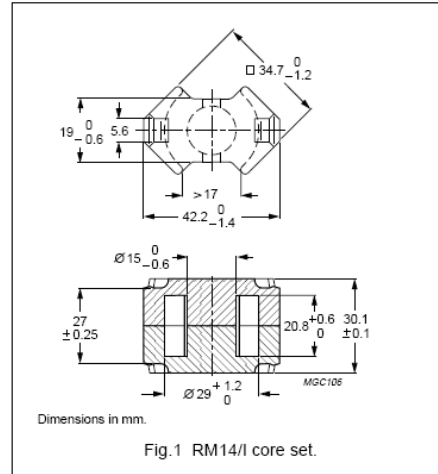
RM cores and accessories

RM14/I

CORE SETS

Effective core parameters

SYMBOL	PARAMETER	VALUE	UNIT
$\Sigma(l/A)$	core factor (C1)	0.353	mm ⁻¹
V_e	effective volume	13900	mm ³
l_e	effective length	70.0	mm
A_e	effective area	198	mm ²
A_{min}	minimum area	168	mm ²
m	mass of set	≈ 69	g



Core sets for general purpose transformers and power applications

Clamping force for A_L measurements, 80 ± 20 N.

GRADE	A_L (nH)	μ_e	AIR GAP (μm)	TYPE NUMBER
3C90	250 ± 3%	≈ 70	≈ 1270	RM14/I-3C90-A250
	315 ± 3%	≈ 89	≈ 950	RM14/I-3C90-A315
	400 ± 3%	≈ 113	≈ 710	RM14/I-3C90-A400
	630 ± 5%	≈ 177	≈ 410	RM14/I-3C90-A630
	1000 ± 5%	≈ 281	≈ 240	RM14/I-3C90-A1000
	6600 ± 25%	≈ 1850	≈ 0	RM14/I-3C90
3C94	250 ± 3%	≈ 70	≈ 1270	RM14/I-3C94-A250
	315 ± 3%	≈ 89	≈ 950	RM14/I-3C94-A315
	400 ± 3%	≈ 113	≈ 710	RM14/I-3C94-A400
	630 ± 5%	≈ 177	≈ 410	RM14/I-3C94-A630
	1000 ± 5%	≈ 281	≈ 240	RM14/I-3C94-A1000
	6600 ± 25%	≈ 1850	≈ 0	RM14/I-3C94
3C96 dis	5700 ± 25%	≈ 1600	≈ 0	RM14/I-3C96
3F3	250 ± 3%	≈ 70	≈ 1270	RM14/I-3F3-A250
	315 ± 3%	≈ 89	≈ 950	RM14/I-3F3-A315
	400 ± 3%	≈ 113	≈ 710	RM14/I-3F3-A400
	630 ± 5%	≈ 177	≈ 410	RM14/I-3F3-A630
	1000 ± 5%	≈ 281	≈ 240	RM14/I-3F3-A1000
	5700 ± 25%	≈ 1600	≈ 0	RM14/I-3F3

Ferroxcube

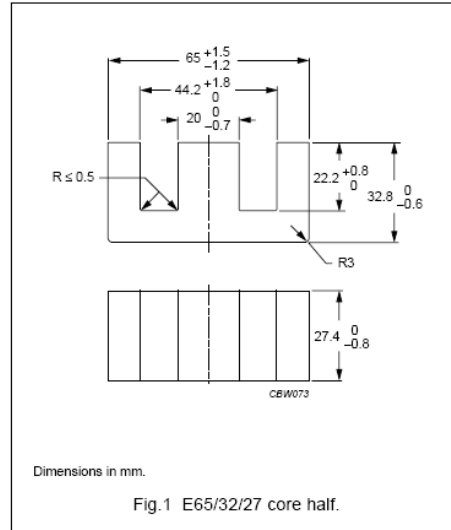
E cores and accessories

E65/32/27

CORE SETS

Effective core parameters

SYMBOL	PARAMETER	VALUE	UNIT
$\Sigma(l/A)$	core factor (C1)	0.274	mm ⁻¹
V_e	effective volume	79000	mm ³
l_e	effective length	147	mm
A_e	effective area	540	mm ²
A_{min}	minimum area	530	mm ²
m	mass of core half	≈205	g



Core halves

A_L measured in combination with a non-gapped core half, clamping force for A_L measurements 60 ±20 N, unless stated otherwise.

GRADE	A_L (nH)	μ_e	AIR GAP (μm)	TYPE NUMBER
3C90	100 ±5% ⁽¹⁾	≈ 22	≈ 7190	E65/32/27-3C90-E100
	160 ±5% ⁽¹⁾	≈ 35	≈ 3780	E65/32/27-3C90-E160
	250 ±5% ⁽¹⁾	≈ 54	≈ 2050	E65/32/27-3C90-E250
	315 ±5% ⁽¹⁾	≈ 68	≈ 1510	E65/32/27-3C90-E315
	400 ±8% ⁽¹⁾	≈ 87	≈ 1100	E65/32/27-3C90-E400
	630 ±10% ⁽¹⁾	≈ 136	≈ 620	E65/32/27-3C90-E630
	8600 ±25%	≈ 1860	≈ 0	E65/32/27-3C90
3C92 des	6000 ±25%	≈ 1310	≈ 0	E65/32/27-3C92
3C94	8600 ±25%	≈ 1860	≈ 0	E65/32/27-3C94
3F3	100 ±5% ⁽¹⁾	≈ 22	≈ 7190	E65/32/27-3F3-E100
	160 ±5% ⁽¹⁾	≈ 35	≈ 3780	E65/32/27-3F3-E160
	250 ±5% ⁽¹⁾	≈ 54	≈ 2050	E65/32/27-3F3-E250
	315 ±5% ⁽¹⁾	≈ 68	≈ 1510	E65/32/27-3F3-E315
	400 ±8% ⁽¹⁾	≈ 87	≈ 1100	E65/32/27-3F3-E400
	630 ±10% ⁽¹⁾	≈ 136	≈ 620	E65/32/27-3F3-E630
	7300 ±25%	≈ 1580	≈ 0	E65/32/27-3F3

Ferroxcube

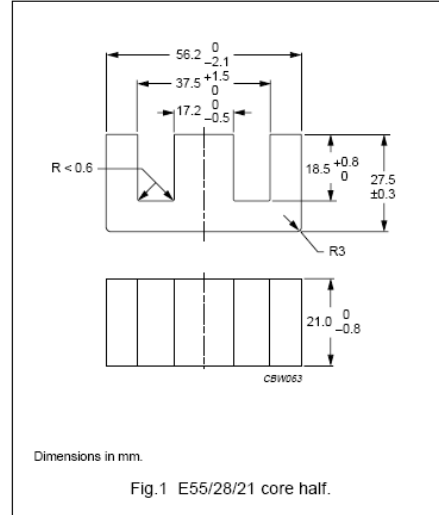
E cores and accessories

E55/28/21

CORE SETS

Effective core parameters

SYMBOL	PARAMETER	VALUE	UNIT
$\Sigma(l/A)$	core factor (C1)	0.350	mm ⁻¹
V_e	effective volume	44000	mm ³
l_e	effective length	124	mm
A_e	effective area	353	mm ²
A_{min}	minimum area	345	mm ²
m	mass of core half	≈ 108	g



Core halves

A_L measured in combination with a non-gapped core half, clamping force for A_L measurements 40 ±20 N, unless stated otherwise.

GRADE	A_L (nH)	μ_e	AIR GAP (μm)	TYPE NUMBER
3C81	100 ±5% ⁽¹⁾	≈ 28	≈ 8740	E55/28/21-3C81-E100
	160 ±5% ⁽¹⁾	≈ 45	≈ 4560	E55/28/21-3C81-E160
	250 ±5% ⁽¹⁾	≈ 70	≈ 2500	E55/28/21-3C81-E250
	315 ±5% ⁽¹⁾	≈ 88	≈ 1840	E55/28/21-3C81-E315
	400 ±8% ⁽¹⁾	≈ 112	≈ 1360	E55/28/21-3C81-E400
	630 ±10% ⁽¹⁾	≈ 176	≈ 780	E55/28/21-3C81-E630
3C90	8625 ±25%	≈ 2410	≈ 0	E55/28/21-3C81
	100 ±5% ⁽¹⁾	≈ 28	≈ 8740	E55/28/21-3C90-E100
	160 ±5% ⁽¹⁾	≈ 45	≈ 4560	E55/28/21-3C90-E160
	250 ±5% ⁽¹⁾	≈ 70	≈ 2500	E55/28/21-3C90-E250
	315 ±5% ⁽¹⁾	≈ 88	≈ 1840	E55/28/21-3C90-E315
	400 ±8% ⁽¹⁾	≈ 112	≈ 1360	E55/28/21-3C90-E400
	630 ±10% ⁽¹⁾	≈ 176	≈ 780	E55/28/21-3C90-E630
6300 ±25%	≈ 1760	≈ 0	E55/28/21-3C90	
3C91 <small>des</small>	8625 ±25%	≈ 2410	≈ 0	E55/28/21-3C91
3C92 <small>des</small>	4700 ±25%	≈ 1310	≈ 0	E55/28/21-3C92
3C94	6400 ±25%	≈ 1790	≈ 0	E55/28/21-3C94