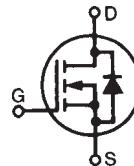


# PolarHV™ HiPerFET Power MOSFET

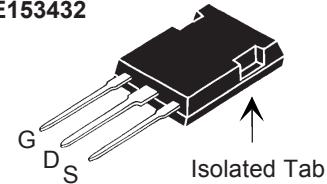
(Electrically Isolated Back Surface)

N-Channel Enhancement Mode  
Avalanche Rated  
Fast Intrinsic Diode



$V_{DSS}$	=	600	V
$I_{D25}$	=	20	A
$R_{DS(on)}$	$\leq$	200	mΩ
$t_{rr}$	$\leq$	200	ns

ISOPLUS247 (IXFR)  
 E153432



G = Gate      D = Drain  
S = Source

Symbol	Test Conditions	Maximum Ratings		
$V_{DSS}$	$T_J = 25^\circ C$ to $150^\circ C$	600	V	
$V_{DGR}$	$T_J = 25^\circ C$ to $150^\circ C$ ; $R_{GS} = 1 M\Omega$	600	V	
$V_{GSS}$	Continuous	$\pm 30$	V	
$V_{GSM}$	Transient	$\pm 40$	V	
$I_{D25}$	$T_c = 25^\circ C$	20	A	
$I_{DM}$	$T_c = 25^\circ C$ , pulse width limited by $T_{JM}$	80	A	
$I_{AR}$	$T_c = 25^\circ C$	36	A	
$E_{AR}$	$T_c = 25^\circ C$	50	mJ	
$E_{AS}$	$T_c = 25^\circ C$	1.5	J	
$dv/dt$	$I_s \leq I_{DM}$ , $di/dt \leq 100 A/\mu s$ , $V_{DD} \leq V_{DSS}$ , $T_J \leq 150^\circ C$ , $R_G = 2 \Omega$	20	V/ns	
$P_D$	$T_c = 25^\circ C$	208	$^\circ C$	
$T_J$		-55 ... +150	$^\circ C$	
$T_{JM}$		150	$^\circ C$	
$T_{stg}$		-55 ... +150	$^\circ C$	
$T_L$	1.6 mm (0.062 in.) from case for 10 s	300	$^\circ C$	
$T_{SOLD}$	Plastic body for 10 s	260	$^\circ C$	
$V_{ISOL}$	50/60 Hz, RMS, 1 minute	2500	V $\sim$	
$F_c$	Mounting force	20..120/4.6..27	N/lb	
Weight		5	g	

## Features

- | Silicon chip on Direct-Copper-Bond substrate
  - High power dissipation
  - Isolated mounting surface
  - 2500V electrical isolation
- | International standard package
- | Fast recovery diode
- | Unclamped Inductive Switching (UIS) rated
- | Low package inductance
  - easy to drive and to protect

Symbol	Test Conditions ( $T_J = 25^\circ C$ , unless otherwise specified)	Characteristic Values			Advantages
		Min.	Typ.	Max.	
$BV_{DSS}$	$V_{GS} = 0 V$ , $I_D = 250 \mu A$	600		V	
$V_{GS(th)}$	$V_{DS} = V_{GS}$ , $I_D = 4 mA$	3.0		5.0 V	
$I_{GSS}$	$V_{GS} = \pm 30 V$ , $V_{DS} = 0 V$			$\pm 100 nA$	
$I_{DSS}$	$V_{DS} = V_{DSS}$ $V_{GS} = 0 V$			25 $\mu A$	
				250 $\mu A$	
$R_{DS(on)}$	$V_{GS} = 10 V$ , $I_D = I_T$ (note 1) Pulse test, $t \leq 300 \mu s$ , duty cycle $d \leq 2 \%$			200 mΩ	

## Symbol Test Conditions

## Characteristic Values

(T<sub>J</sub> = 25°C, unless otherwise specified)

Min. Typ. Max.

<b>g<sub>fs</sub></b>	V <sub>DS</sub> = 20 V; I <sub>D</sub> = I <sub>T</sub> , pulse test	25	40	S
<b>C<sub>iss</sub></b> <b>C<sub>oss</sub></b> <b>C<sub>rss</sub></b>	V <sub>GS</sub> = 0 V, V <sub>DS</sub> = 25 V, f = 1 MHz	5800	pF	
		570	pF	
		30	pF	
<b>t<sub>d(on)</sub></b> <b>t<sub>r</sub></b> <b>t<sub>d(off)</sub></b> <b>t<sub>f</sub></b>	V <sub>GS</sub> = 10 V, V <sub>DS</sub> = 0.5 V <sub>DSS</sub> , I <sub>D</sub> = I <sub>T</sub> R <sub>G</sub> = 2 Ω (External)	30	ns	
		25	ns	
		80	ns	
		22	ns	
<b>Q<sub>g(on)</sub></b> <b>Q<sub>gs</sub></b> <b>Q<sub>gd</sub></b>	V <sub>GS</sub> = 10 V, V <sub>DS</sub> = 0.5 V <sub>DSS</sub> , I <sub>D</sub> = I <sub>T</sub>	102	nC	
		34	nC	
		36	nC	
<b>R<sub>thJC</sub></b>			0.6 °C/W	
<b>R<sub>thCS</sub></b>		0.15		°C/W

Note 1: Test current I<sub>T</sub> = 18 A

## Source-Drain Diode

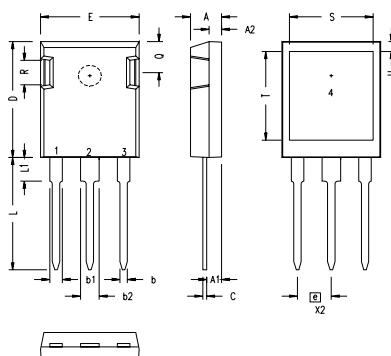
## Characteristic Values

(T<sub>J</sub> = 25°C, unless otherwise specified)

Min. Typ. Max.

<b>I<sub>s</sub></b>	V <sub>GS</sub> = 0 V		36	A
<b>I<sub>SM</sub></b>	Repetitive		80	A
<b>V<sub>SD</sub></b>	I <sub>F</sub> = I <sub>s</sub> , V <sub>GS</sub> = 0 V, Pulse test, t ≤ 300 μs, duty cycle d ≤ 2 %		1.5	V
<b>t<sub>rr</sub></b> <b>Q<sub>RM</sub></b>	I <sub>F</sub> = 25A, -di/dt = 100 A/μs V <sub>R</sub> = 100V, V <sub>GS</sub> = 0 V		200	ns
			0.8	μC
			6.0	A

## ISOPLUS247 (IXFR) Outline

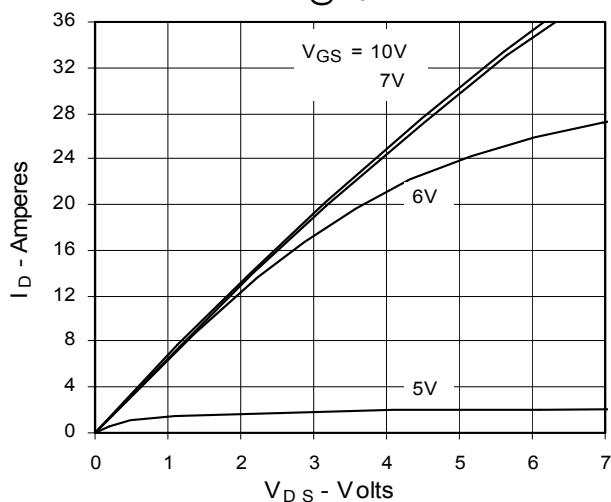


SYM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	.190	.205	4.83	5.21
A1	.090	.100	2.29	2.54
A2	.075	.085	1.91	2.16
b	.045	.055	1.14	1.40
b1	.075	.084	1.91	2.13
b2	.115	.123	2.92	3.12
C	.024	.031	0.61	0.80
D	.819	.840	20.80	21.34
E	.620	.635	15.75	16.13
e	.215 BSC		5.45 BSC	
L	.780	.800	19.81	20.32
L1	.150	.170	3.81	4.32
Q	.220	.244	5.59	6.20
R	.170	.190	4.32	4.83
S	.520	.540	13.21	13.72
T	.620	.640	15.75	16.26
U	.065	.080	1.65	2.03

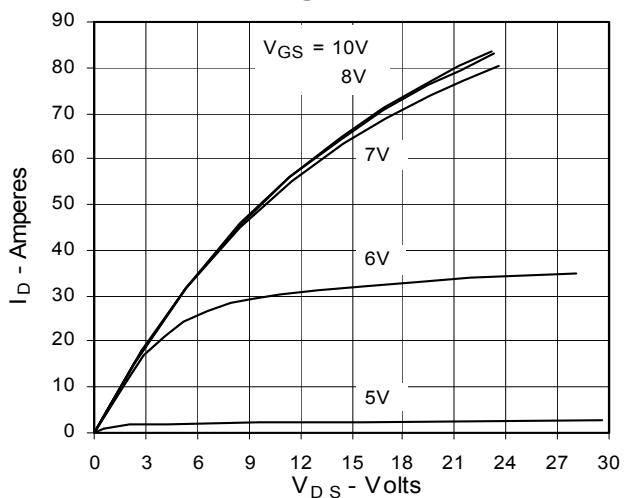
- 1 – GATE  
2 – DRAIN (COLLECTOR)  
3 – SOURCE (EMITTER)  
4 – NO CONNECTION

NOTE: This drawing will meet all dimensions requirement of JEDEC outline TO-247AD except screw hole.

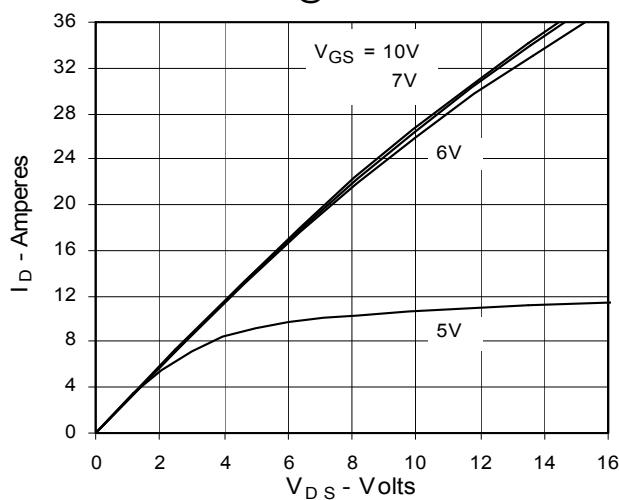
**Fig. 1. Output Characteristics  
@ 25°C**



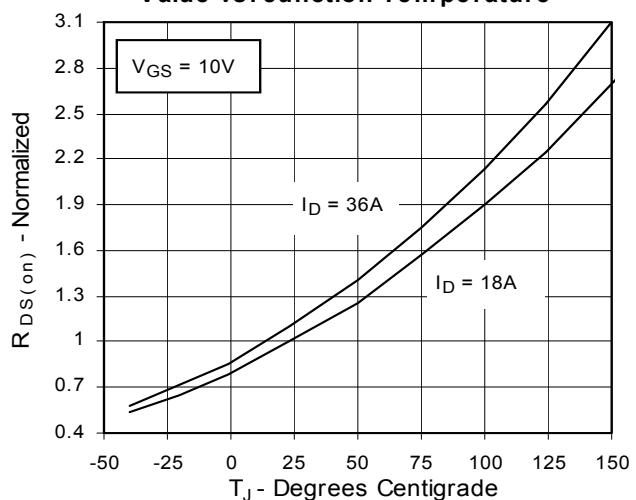
**Fig. 2. Extended Output Characteristics  
@ 25°C**



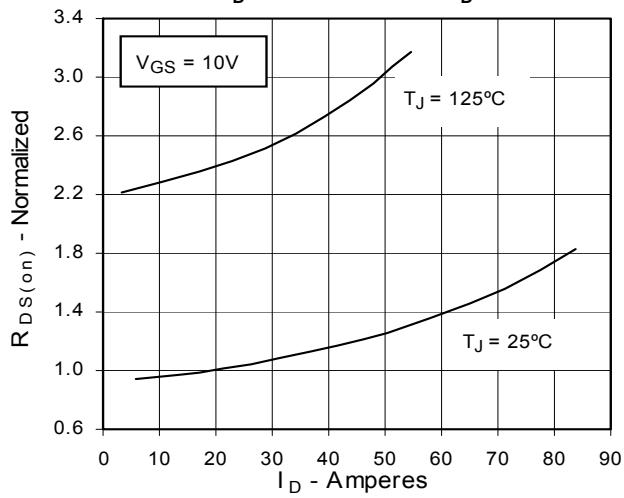
**Fig. 3. Output Characteristics  
@ 125°C**



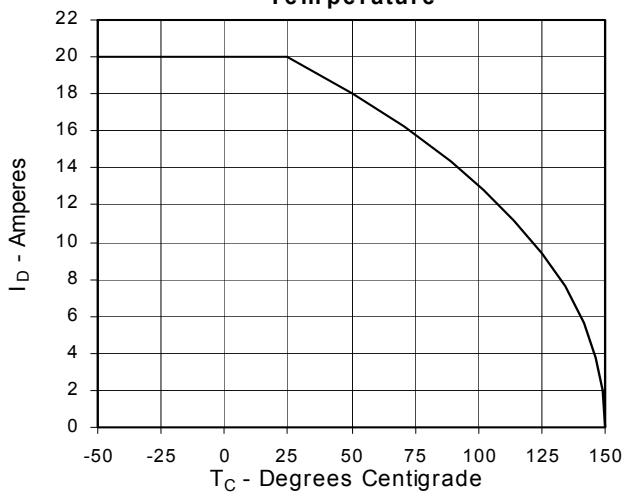
**Fig. 4.  $R_{DS(on)}$  Normalized to  $I_D = 18A$   
Value vs. Junction Temperature**

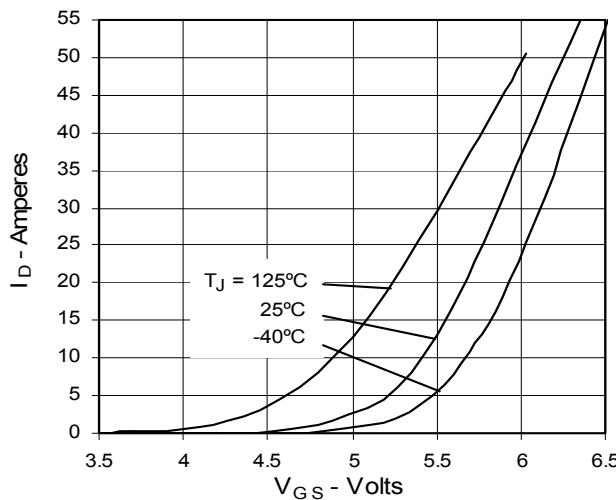
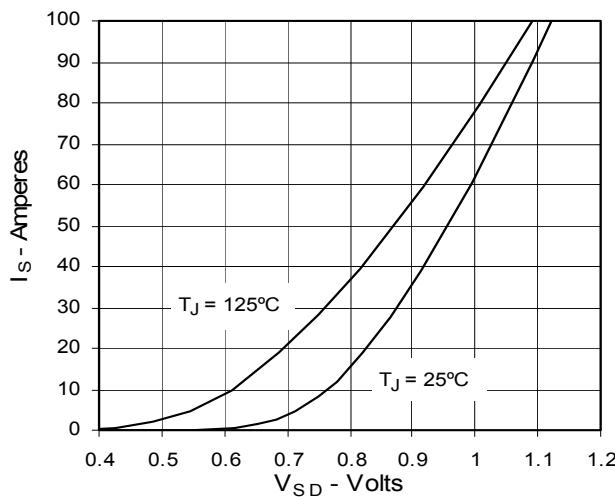
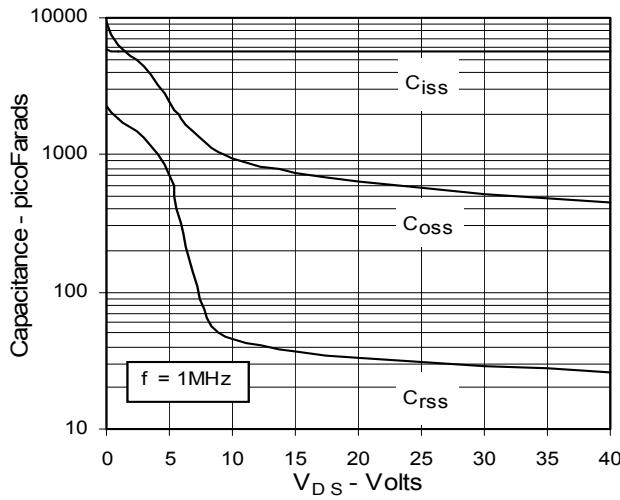
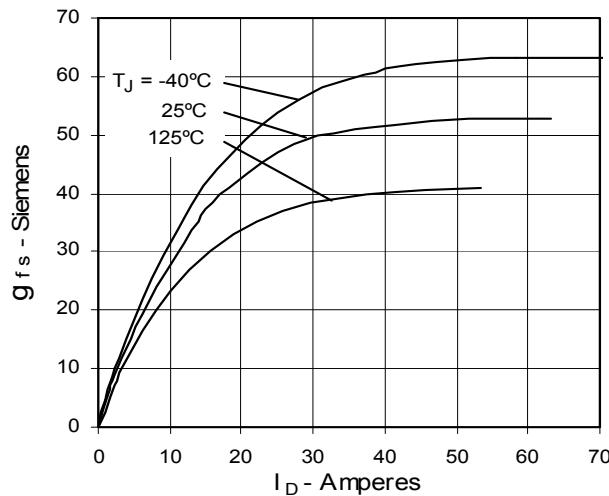
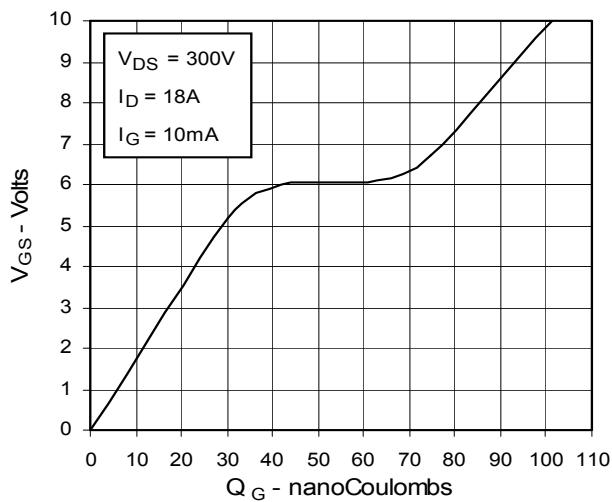
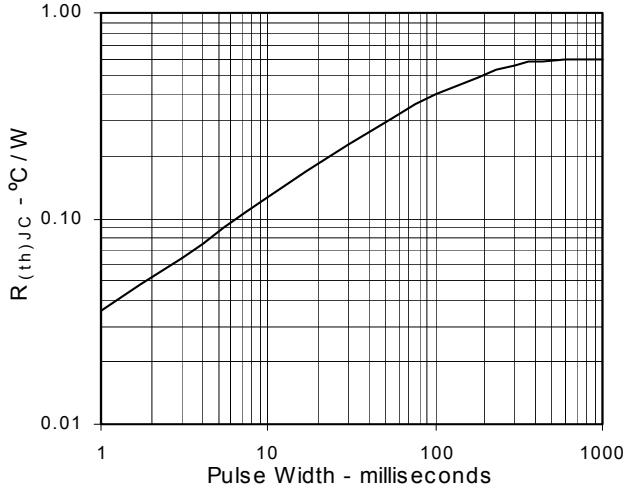


**Fig. 5.  $R_{DS(on)}$  Normalized to  
 $I_D = 18A$  Value vs.  $I_D$**



**Fig. 6. Drain Current vs. Case  
Temperature**



**Fig. 7. Input Admittance**

**Fig. 9. Source Current vs.  
Source-To-Drain Voltage**

**Fig. 11. Capacitance**

**Fig. 8. Transconductance**

**Fig. 10. Gate Charge**

**Fig. 12. Maximum Transient Thermal Resistance**




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