

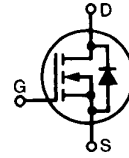
# High Current MegaMOS™ FET

## IXTK 33N50

$V_{DSS} = 500\text{ V}$   
 $I_{D(\text{cont})} = 33\text{ A}$   
 $R_{DS(\text{on})} = 0.17\ \Omega$

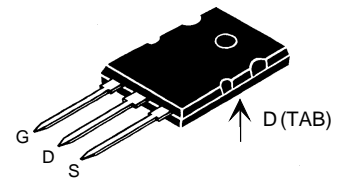
### N-Channel Enhancement Mode

Preliminary data



Symbol	Test conditions	Maximum ratings	
$V_{DSS}$	$T_J = 25^\circ\text{C to } 150^\circ\text{C}$	500	V
$V_{DGR}$	$T_J = 25^\circ\text{C to } 150^\circ\text{C}; R_{GS} = 1.0\text{ M}\Omega$	500	V
$V_{GS}$	Continuous	$\pm 20$	V
$V_{GSM}$	Transient	$\pm 30$	V
$I_{D25}$	$T_C = 25^\circ\text{C}$	33	A
$I_{DM}$	$T_C = 25^\circ\text{C}$ , pulse width limited by $T_{JM}$	132	A
$P_D$	$T_C = 25^\circ\text{C}$	416	W
$T_J$		-55 ... +150	$^\circ\text{C}$
$T_{JM}$		150	$^\circ\text{C}$
$T_{sig}$		-55 ... +150	$^\circ\text{C}$
<b>Md</b>	Mounting torque	1.13/10	Nm/lb.in.
<b>Weight</b>		10	g
Max lead temperature for soldering 1.6 mm (0.062 in.) from case for 10 s		300	$^\circ\text{C}$

TO-264 AA



G = Gate  
S = Source

D = Drain  
TAB = Drain

Symbol	Test Conditions ( $T_J = 25^\circ\text{C}$ unless otherwise specified)	Characteristic Values		
		Min.	Typ.	Max.
$V_{DSS}$	$V_{GS} = 0\text{ V}, I_D = 5\text{ mA}$ $BV_{DSS}$ temperature coefficient	500	0.087	V %/K
$V_{GS(\text{th})}$	$V_{DS} = V_{GS}, I_D = 250\ \mu\text{A}$ $V_{GS(\text{th})}$ temperature coefficient	2.0	-0.25	V %/K
$I_{GSS}$	$V_{GS} = \pm 20\text{ V DC}, V_{DS} = 0$			$\pm 100$ nA
$I_{DSS}$	$V_{DS} = 0.8 V_{DSS}$ $V_{GS} = 0\text{ V}$			$T_J = 25^\circ\text{C}$ : 200 $\mu\text{A}$ $T_J = 125^\circ\text{C}$ : 3 mA
$R_{DS(\text{on})}$	$V_{GS} = 10\text{ V}, I_D = 0.5 I_{D25}$			0.17 $\Omega$

### Features

- Low  $R_{DS(\text{on})}$  HDMOS™ process
- Rugged polysilicon gate cell structure
- International standard package
- Fast switching times

### Applications

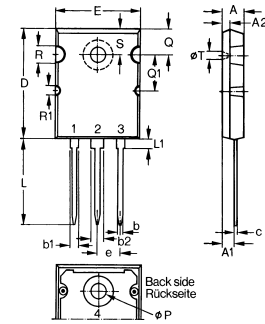
- Motor controls
- DC choppers
- Uninterruptable Power Supplies (UPS)
- Switch-mode and resonant-mode

### Advantages

- Easy to mount with one screw (isolated mounting screw hole)
- Space savings
- High power density

Symbol	Test Conditions	Characteristic values		
		Min.	Typ.	Max.
(T <sub>J</sub> = 25°C unless otherwise specified)				
<b>g<sub>fs</sub></b>	V <sub>DS</sub> = 10 V; I <sub>D</sub> = 0.5 I <sub>D25</sub> , pulse test		24	S
<b>C<sub>iss</sub></b>	V <sub>GS</sub> = 0 V, V <sub>DS</sub> = 25 V, f = 1 MHz		4900	pF
<b>C<sub>oss</sub></b>			690	pF
<b>C<sub>rss</sub></b>			300	pF
<b>t<sub>d(on)</sub></b>	V <sub>GS</sub> = 10 V, V <sub>DS</sub> = 0.5 V <sub>DSS</sub> , I <sub>D</sub> = 0.5 I <sub>D25</sub> R <sub>G</sub> = 1 Ω (External)		53	ns
<b>t<sub>r</sub></b>			30	ns
<b>t<sub>d(off)</sub></b>			140	ns
<b>t<sub>f</sub></b>			40	ns
<b>Q<sub>g(on)</sub></b>	V <sub>GS</sub> = 10 V, V <sub>DS</sub> = 0.5 V <sub>DSS</sub> , I <sub>D</sub> = 0.5 I <sub>D25</sub>		250	nC
<b>Q<sub>gs</sub></b>			30	nC
<b>Q<sub>gd</sub></b>			115	nC
<b>R<sub>thJC</sub></b>			0.30	K/W
<b>R<sub>thCK</sub></b>		0.15		K/W

TO-264 AA Outline



Dim.	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	4.82	5.13	.190	.202
A1	2.54	2.89	.100	.114
A2	2.00	2.10	.079	.083
b	1.12	1.42	.044	.056
b1	2.39	2.69	.094	.106
b2	2.90	3.09	.114	.122
c	0.53	0.83	.021	.033
D	25.91	26.16	1.020	1.030
E	19.81	19.96	.780	.786
e	5.46 BSC		.215 BSC	
J	0.00	0.25	.000	.010
K	0.00	0.25	.000	.010
L	20.32	20.83	.800	.820
L1	2.29	2.59	.090	.102
P	3.17	3.66	.125	.144
Q	6.07	6.27	.239	.247
Q1	8.38	8.69	.330	.342
R	3.81	4.32	.150	.170
R1	1.78	2.29	.070	.090
S	6.04	6.30	.238	.248
T	1.57	1.83	.062	.072

**Source-Drain Diode**

**Ratings and Characteristics**  
(T<sub>J</sub> = 25°C unless otherwise specified)

Symbol	Test Conditions	Characteristic values		
		Min.	Typ.	Max.
<b>I<sub>S</sub></b>	V <sub>GS</sub> = 0 V			33 A
<b>I<sub>SM</sub></b>	Repetitive; pulse width limited by T <sub>JM</sub>			132 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>	I <sub>F</sub> = I <sub>S</sub> , -di/dt = 100 A/μs, V <sub>R</sub> = 100 V		850	ns

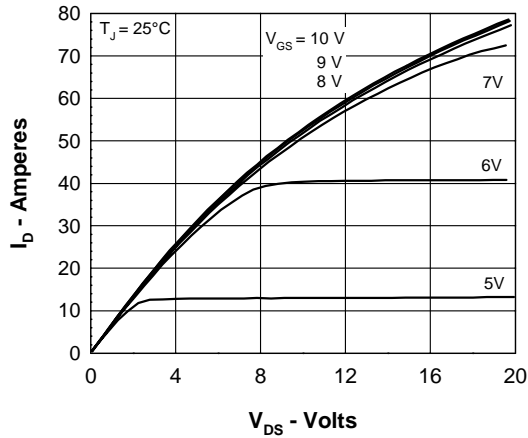


Figure 1. Output Characteristics at 25°C

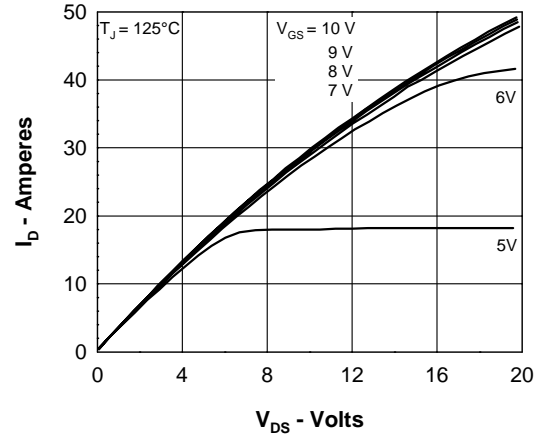


Figure 2. Output Characteristics at 125°C

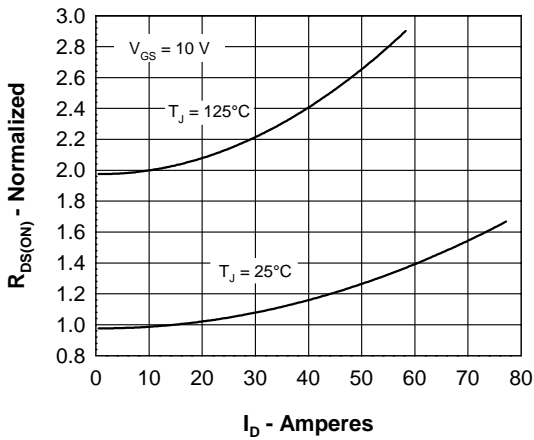


Figure 3.  $R_{DS(on)}$  normalized to 16.5A/25°C vs.  $I_D$

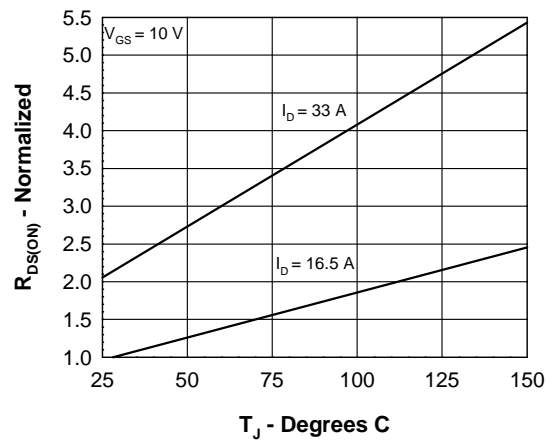


Figure 4.  $R_{DS(on)}$  normalized to 16.5A/25°C vs.  $T_J$

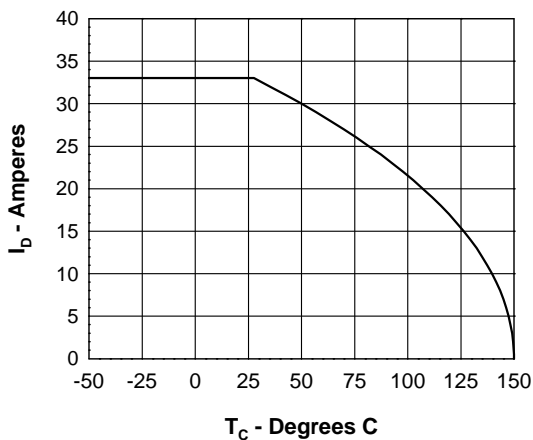


Figure 5. Drain Current vs. Case Temperature

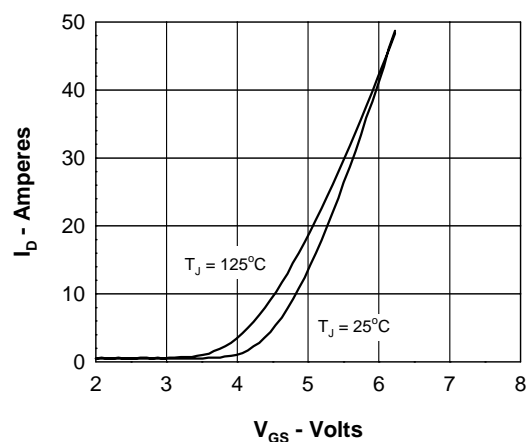


Figure 6. Admittance Curves

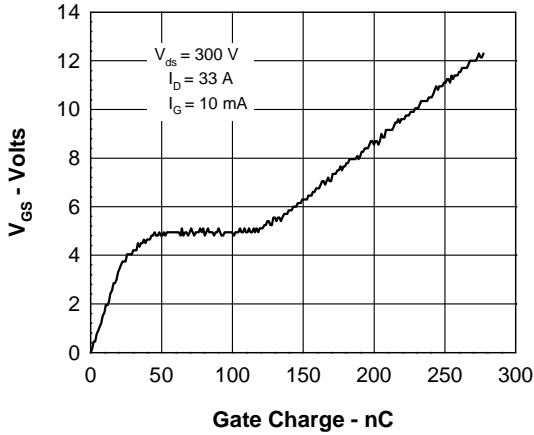


Figure 7. Gate Charge

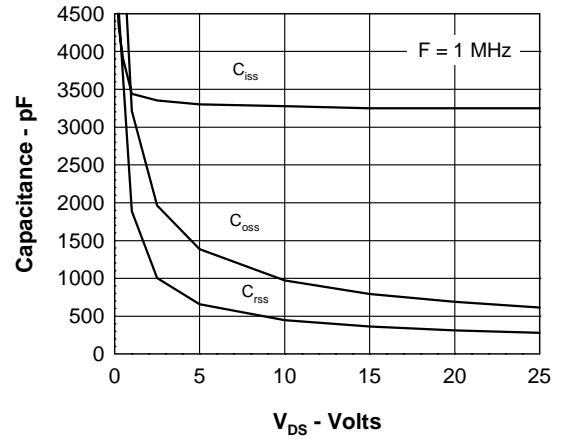


Figure 8. Capacitance Curves

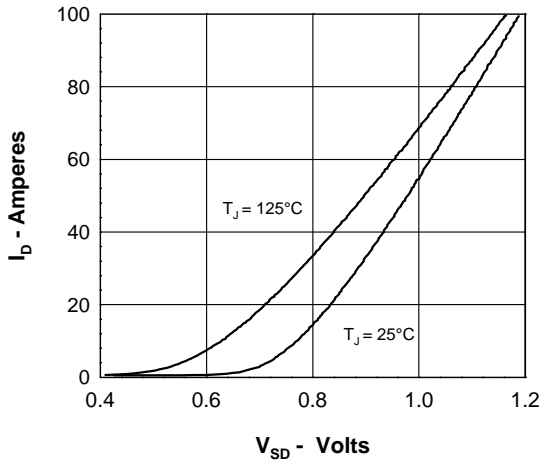


Figure 9. Source Current vs. Source-to-Drain Voltage

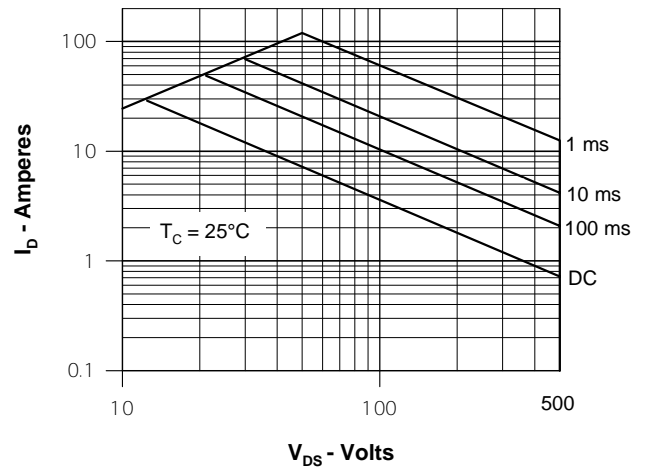


Figure 10. Forward Biased SOA

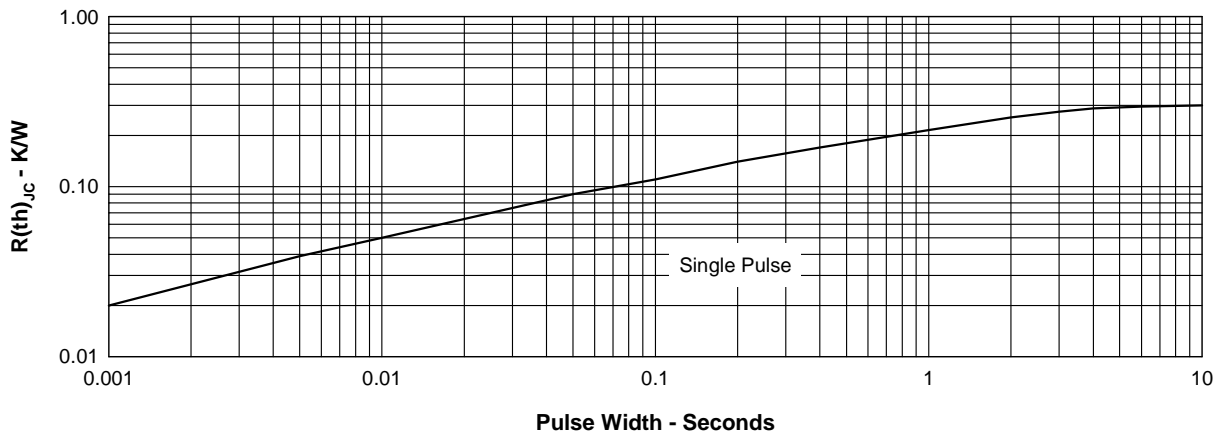


Figure 11. Transient Thermal Resistance