



High Current MegaMOS™ FET

IXTK 33N50

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

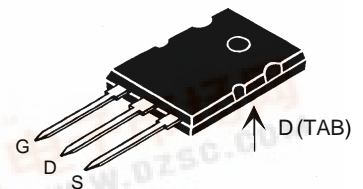
N-Channel Enhancement Mode



Preliminary data

Symbol	Test conditions	Maximum ratings	TO-264 AA
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	± 20	V
V_{GSM}	Transient	± 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_{stg}		-55 ... +150	$^\circ\text{C}$
M_d	Mounting torque	1.13/10	Nm/lb.in.
Weight		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}	$V_{GS} = \pm 20\text{ V DC}, V_{DS} = 0$			$\pm 100\text{ nA}$
I_{DSS}	$V_{DS} = 0.8 V_{DSS}$ $V_{GS} = 0\text{ V}$ $T_J = 25^\circ\text{C}$ $T_J = 125^\circ\text{C}$			200 μA 3 mA
$R_{DS(\text{on})}$	$V_{GS} = 10\text{ V}, I_D = 0.5 I_{D25}$			0.17 Ω

Features

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

Applications

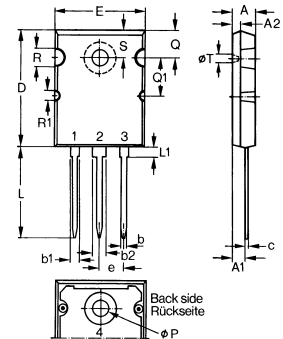
- Motor controls
- DC choppers
- Uninterruptable Power Supplies (UPS)
- Switch-mode and resonant-mode

Advantages

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



Symbol	Test Conditions ($T_J = 25^\circ\text{C}$ unless otherwise specified)	Characteristic values		
		Min.	Typ.	Max.
g_{fs}	$V_{DS} = 10\text{ V}; I_D = 0.5 I_{D25}$, pulse test		24	S
C_{iss}	$V_{GS} = 0\text{ V}, V_{DS} = 25\text{ V}, f = 1\text{ MHz}$		4900	pF
C_{oss}			690	pF
C_{rss}			300	pF
$t_{d(on)}$	$V_{GS} = 10\text{ V}, V_{DS} = 0.5 V_{DSS}, I_D = 0.5 I_{D25}$ $R_G = 1\ \Omega$ (External)		53	ns
t_r			30	ns
$t_{d(off)}$			140	ns
t_f			40	ns
$Q_{g(on)}$	$V_{GS} = 10\text{ V}, V_{DS} = 0.5 V_{DSS}, I_D = 0.5 I_{D25}$		250	nC
Q_{gs}			30	nC
Q_{gd}			115	nC
R_{thJC}				0.30 K/W
R_{thCK}		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
 ($T_J = 25^\circ\text{C}$ unless otherwise specified)

Symbol	Test Conditions	Min.	Typ.	Max.
I_S	$V_{GS} = 0\text{ V}$			33 A
I_{SM}	Repetitive; pulse width limited by T_{JM}			132 A
V_{SD}	$I_F = I_S, V_{GS} = 0\text{ V}$, Pulse test, $t \leq 300\ \mu\text{s}$, duty cycle $d \leq 2\%$			1.5 V
t_{rr}	$I_F = I_S, -di/dt = 100\text{ A}/\mu\text{s}, V_R = 100\text{ V}$		850	ns

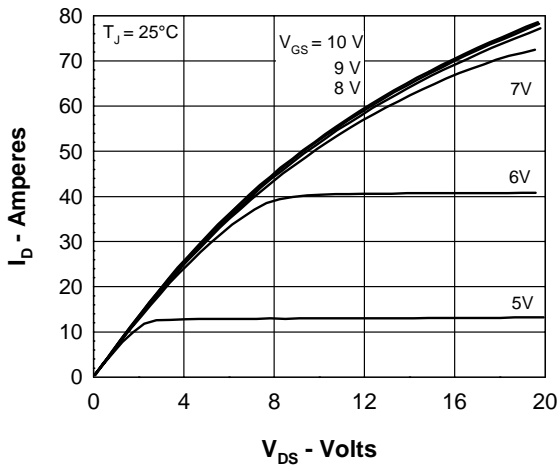


Figure 1. Output Characteristics at 25°C

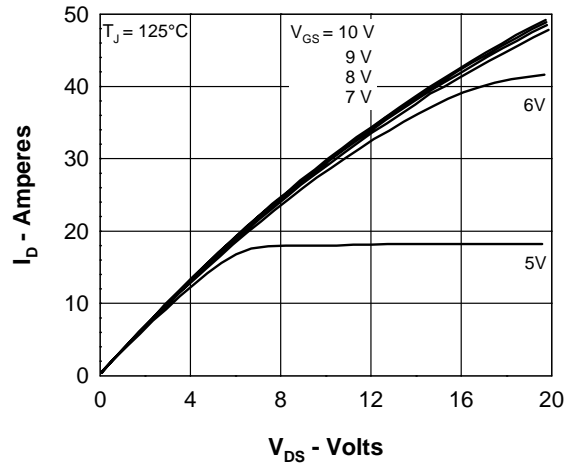


Figure 2. Output Characteristics at 125°C

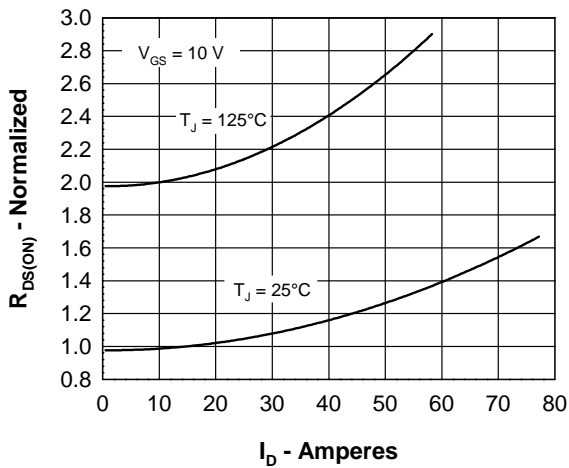


Figure 3. $R_{DS(on)}$ normalized to 16.5A/25°C vs. I_D

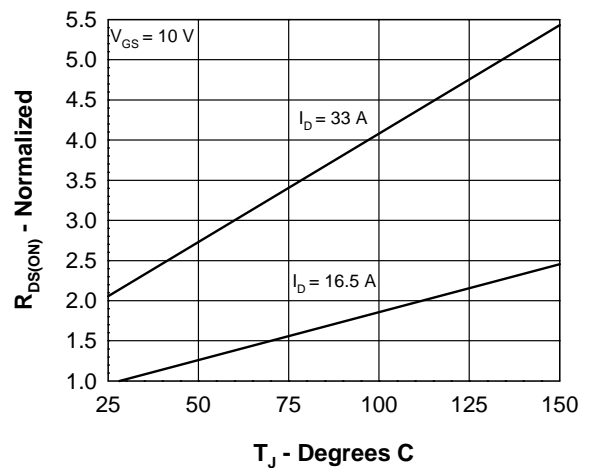


Figure 4. $R_{DS(on)}$ normalized to 16.5A/25°C vs. T_J

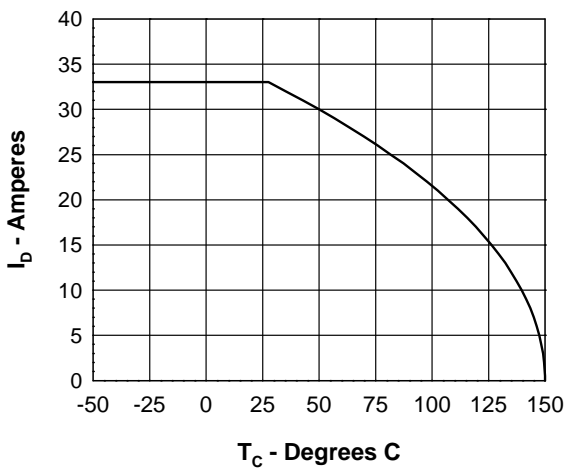


Figure 5. Drain Current vs. Case Temperature

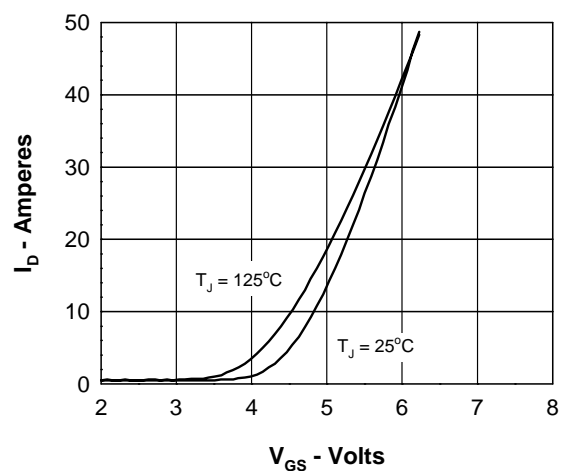


Figure 6. Admittance Curves

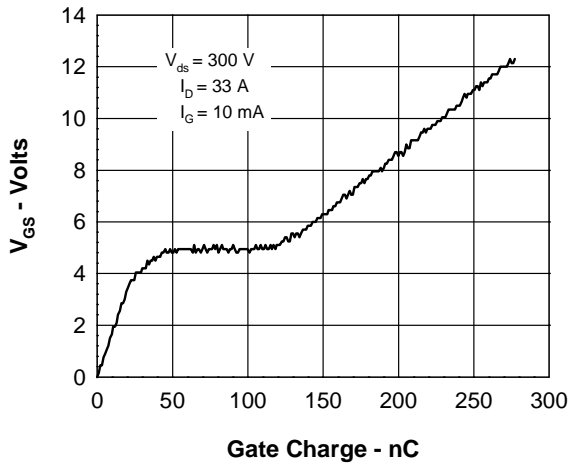


Figure 7. Gate Charge

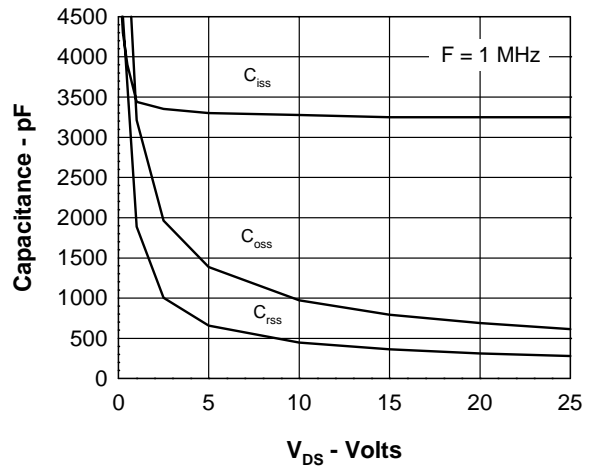


Figure 8. Capacitance Curves

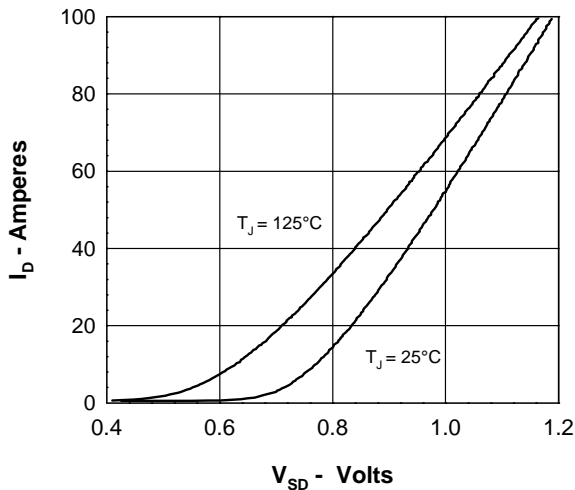


Figure 9. Source Current vs. Source-to-Drain Voltage

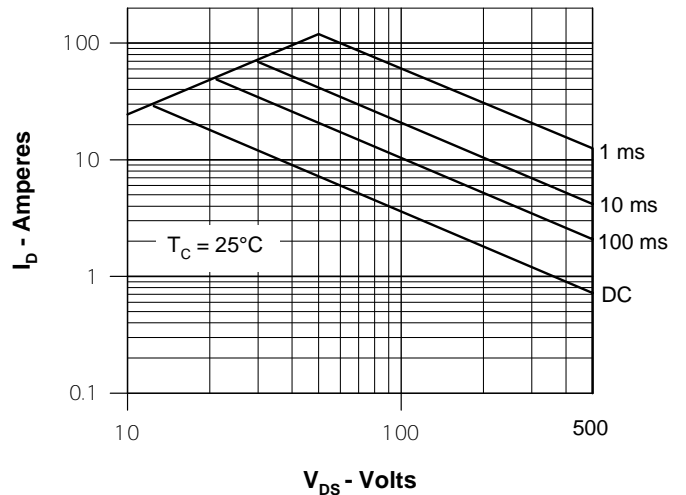


Figure 10. Forward Biased SOA

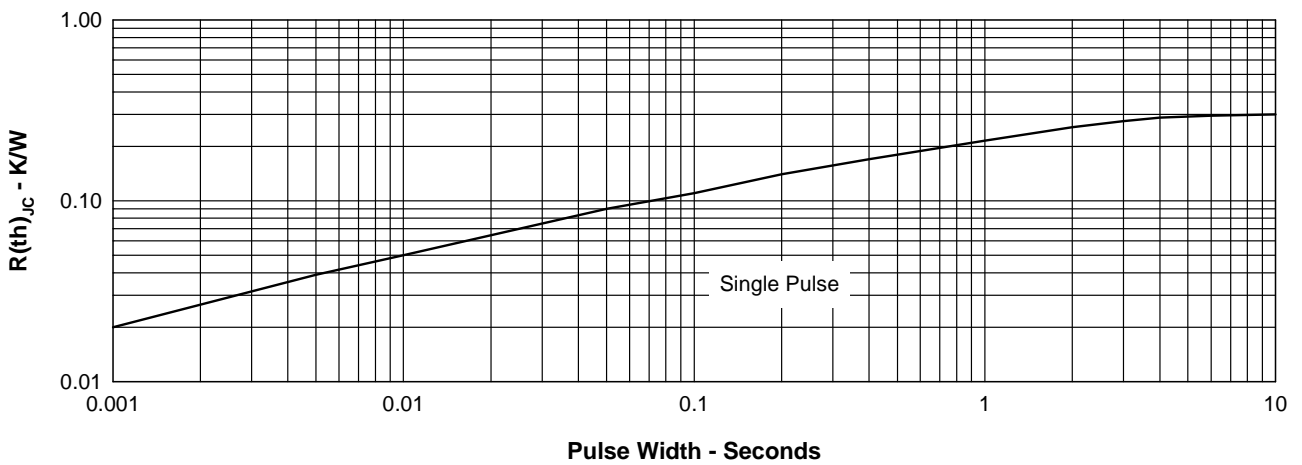


Figure 11. Transient Thermal Resistance