PRODUCT SUMMARY

V_{DS} (V)	$R_{DS(on)}$ (mΩ)	I_D (A)[a, e]	Q_g (Typ)
30	7 at V_{GS} = 10 V	50	25 nC
	9 at V_{GS} = 4.5 V	40	
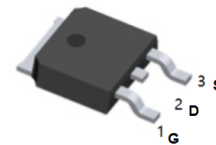
APPLICATIONS

- OR-ing
- Server
- DC/DC

N-Channel MOSFET

TO-252(DPAK) top view

ABSOLUTE MAXIMUM RATINGS	(T_A = 25 °C, unless otherwise noted)			
Parameter		Symbol	Limit	Unit
Drain-Source Voltage		V_{DS}	30	V
Gate-Source Voltage		V_{GS}	± 20	
Continuous Drain Current (T_J = 175 °C)	T_C = 25 °C	I_D	50	A
	T_C = 70 °C		40	
	T_A = 25 °C		21.8[b, c]	
	T_A = 70 °C		18[b, c]	
Pulsed Drain Current		I_{DM}	200	
Avalanche Current Pulse	L = 0.1 mH	I_{AS}	39	
Single Pulse Avalanche Energy		E_{AS}	94.8	mJ
Continuous Source-Drain Diode Current	T_C = 25 °C	I_S	50[a, e]	A
	T_A = 25 °C		3.13[b, c]	
Maximum Power Dissipation	T_C = 25 °C	P_D	100[a]	W
	T_C = 70 °C		75	
	T_A = 25 °C		3.25[b, c]	
	T_A = 70 °C		2.33[b, c]	
Operating Junction and Storage Temperature Range		T_J, T_{stg}	- 55 to 175	°C

THERMAL RESISTANCE RATINGS

Parameter		Symbol	Typ.	Max.	Unit
Maximum Junction-to-Ambient[b, d]	t ≤ 10 sec	R_{thJA}	32	40	°C/W
Maximum Junction-to-Case	Steady State	R_{thJC}	0.5	0.6	

Notes:
a. Based on T_C = 25 °C.
b. Surface mounted on 1" x 1" FR4 board.
c. t = 10 sec.
d. Maximum under steady state conditions is 90 °C/W.
e. Calculated based on maximum junction temperature. Package limitation current is 90 A.

## SPECIFICATIONS   (T_J = 25 °C, unless otherwise noted)

| Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Static						
Drain-Source Breakdown Voltage	V_{DS}	V_{GS} = 0 V, I_D = 250 μA	30			V
V_{DS} Temperature Coefficient	$\Delta V_{DS}/T_J$	I_D = 250 μA		35		mV/°C
$V_{GS(th)}$ Temperature Coefficient	$\Delta V_{GS(th)}/T_J$			- 7.5		
Gate-Source Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250 μA	1.5		2.0	V
Gate-Source Leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ± 20 V			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 30 V, V_{GS} = 0 V			1	μA
		V_{DS} = 30 V, V_{GS} = 0 V, T_J = 55 °C			10	
On-State Drain Current[a]	$I_{D(on)}$	$V_{DS} \geq$ 5 V, V_{GS} = 10 V	90			A
Drain-Source On-State Resistance[a]	$R_{DS(on)}$	V_{GS} = 10 V, I_D = 21.8 A		7		mΩ
		V_{GS} = 4.5 V, I_D = 18A		9		
Forward Transconductance[a]	g_{fs}	V_{DS} = 15 V, I_D = 21.8 A		160		S
Dynamic[b]						
Input Capacitance	C_{iss}	V_{DS} = 15 V, V_{GS} = 0 V, f = 1 MHz		2201		pF
Output Capacitance	C_{oss}			525		
Reverse Transfer Capacitance	C_{rss}			370		
Total Gate Charge	Q_g	V_{DS} = 15 V, V_{GS} = 10 V, I_D = 21.8 A		35	45	nC
		V_{DS} = 15 V, V_{GS} = 4.5 V, I_D = 21.8 A		25	35	
Gate-Source Charge	Q_{gs}			15		
Gate-Drain Charge	Q_{gd}			20		
Gate Resistance	R_g	f = 1 MHz		1.4	2.1	Ω
Turn-On Delay Time	$t_{d(on)}$	V_{DD} = 15 V, R_L = 0.625 Ω $I_D \cong$ 24 A, V_{GEN} = 10 V, R_g = 1 Ω		18	27	ns
Rise Time	t_r			11	17	
Turn-Off Delay Time	$t_{d(off)}$			70	105	
Fall Time	t_f			10	15	
Turn-On Delay Time	$t_{d(on)}$	V_{DD} = 15 V, R_L = 0.67 Ω $I_D \cong$ 22.5 A, V_{GEN} = 4.5 V, R_g = 1 Ω		55	83	
Rise Time	t_r			180	270	
Turn-Off Delay Time	$t_{d(off)}$			55	83	
Fall Time	t_f			12	18	
Drain-Source Body Diode Characteristics						
Continuous Source-Drain Diode Current	I_S	T_C = 25 °C			120	A
Pulse Diode Forward Current[a]	I_{SM}				120	
Body Diode Voltage	V_{SD}	I_S = 22 A		0.8	1.2	V
Body Diode Reverse Recovery Time	t_{rr}	I_F = 20 A, di/dt = 100 A/μs, T_J = 25 °C		52	78	ns
Body Diode Reverse Recovery Charge	Q_{rr}			70.2	105	nC
Reverse Recovery Fall Time	t_a			27		ns
Reverse Recovery Rise Time	t_b			25		

Notes:
a. Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2 %.
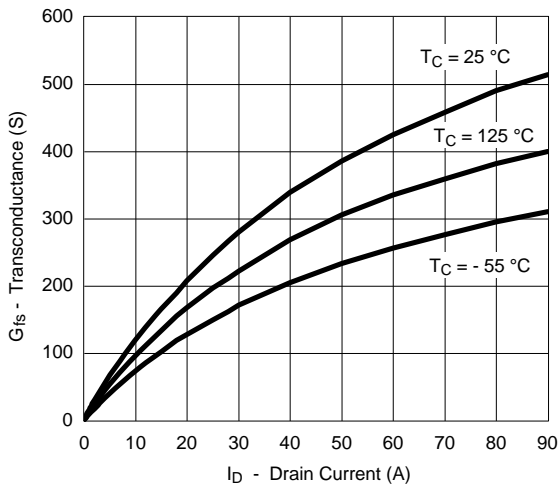b. Guaranteed by design, not subject to production testing.

TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)
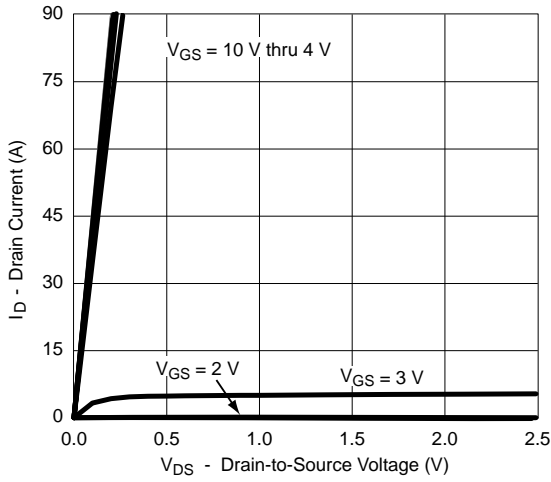
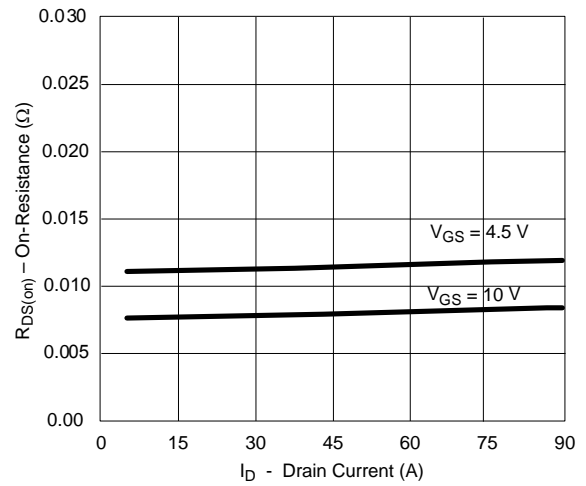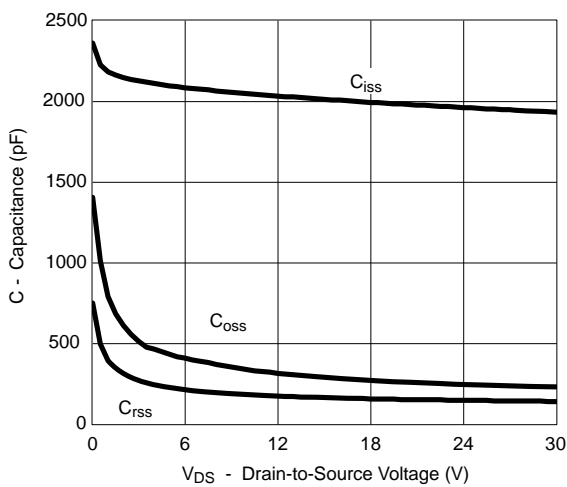**Output Characteristics**
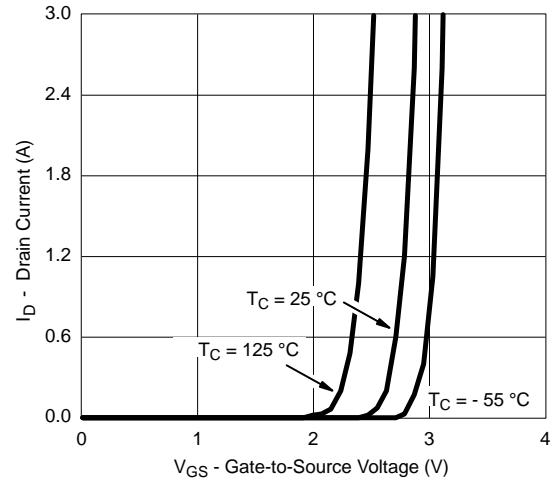
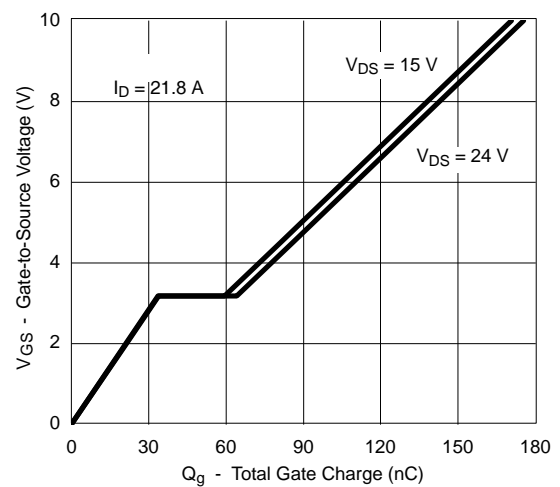**Transfer Characteristics**

Transconductance
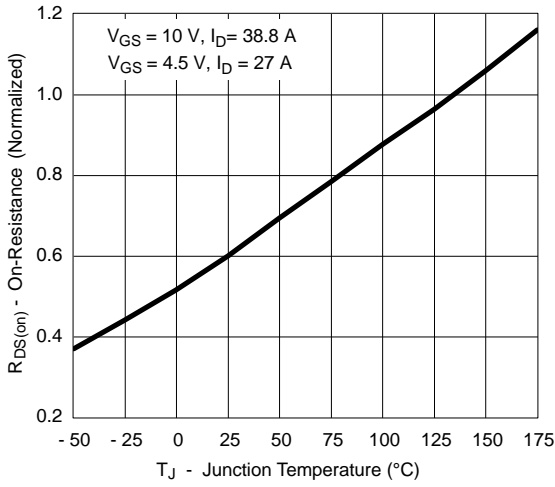
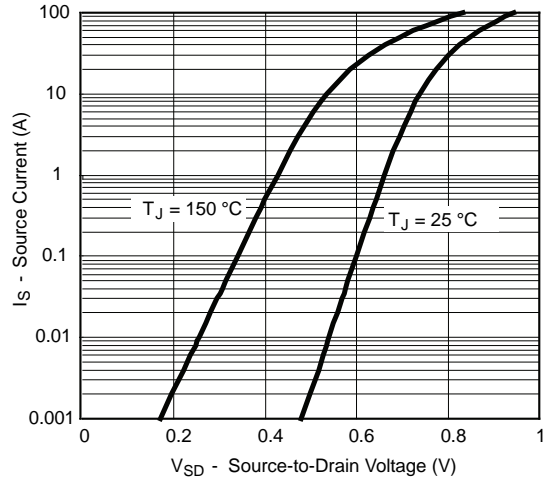

$R_{DS(on)}$ **vs. Drain Current**

Capacitance

Gate Charge

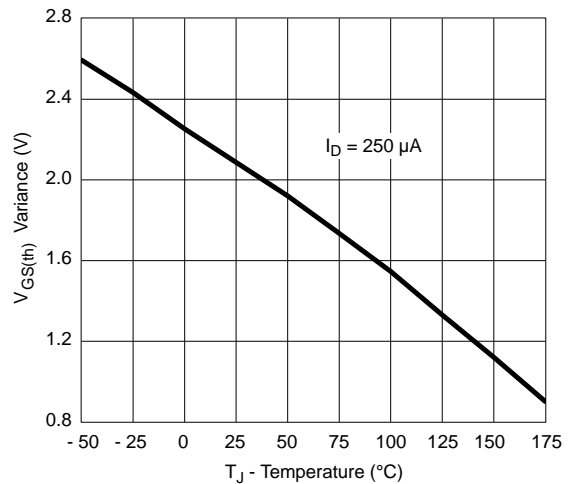## TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)

$V_{GS} = 10$ V, $I_D = 38.8$ A
$V_{GS} = 4.5$ V, $I_D = 27$ A

On-Resistance vs. Junction Temperature

$T_J = 150$ °C $T_J = 25$ °C

Forward Diode Voltage vs. Temperature

$I_D = 38.8$ A

$T_A = 125$ °C

$T_A = 25$ °C
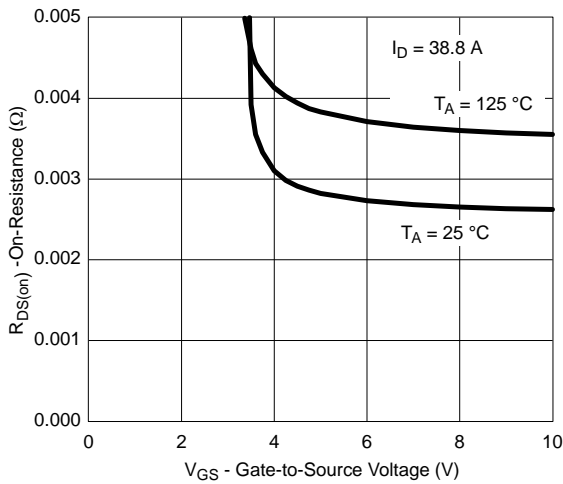
$R_{DS(on)}$ vs. V_{GS} vs. Temperature

$I_D = 250$ µA

Threshold Voltage

*Limited by $r_{DS (on)}$

10 ms
100 ms
1 s
10 s
dc

$T_A = 25$ °C
Single Pulse

*V_{GS} > minimum V_{GS} at which $r_{DS(on)}$ is specified
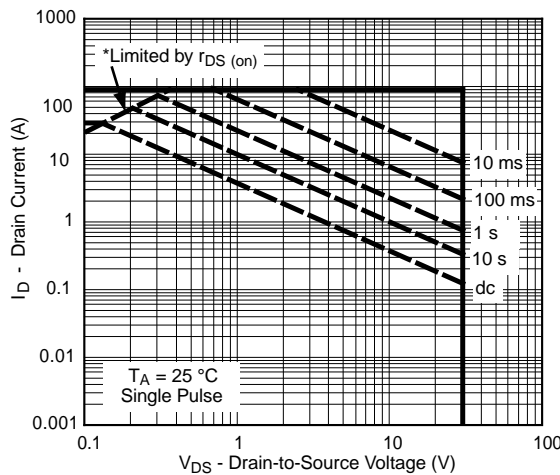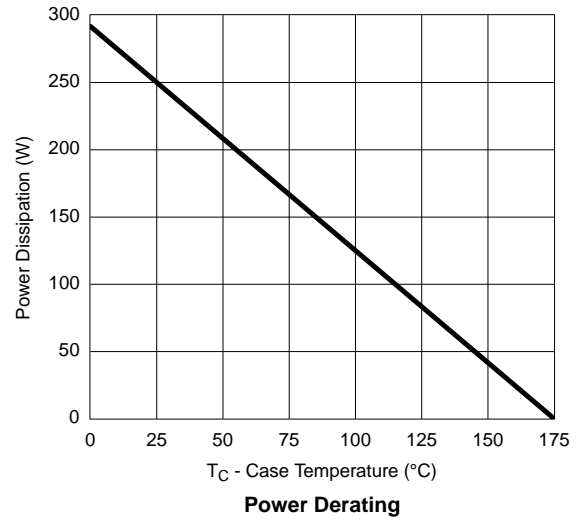
Safe Operating Area, Junction-to-Ambient

TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)

Current Derating*
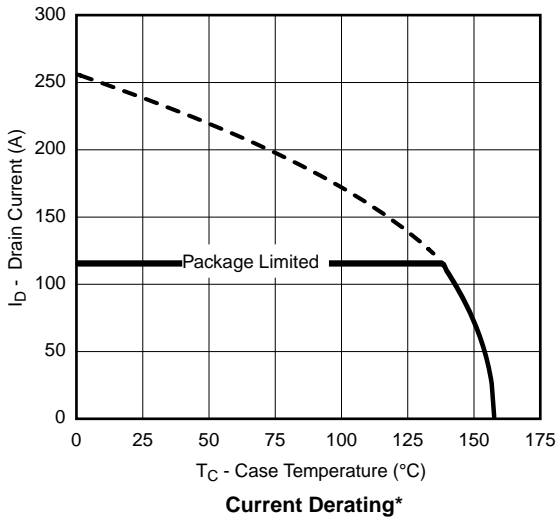
Power Derating

*The power dissipation P_D is based on $T_{J(max)}$ = 175 °C, using junction-to-case thermal resistance, and is more useful in settling the upper dissipation limit for cases where additional heatsinking is used. It is used to determine the current rating, when this rating falls below the package limit.


Normalized Thermal Transient Impedance, Junction-to-Case
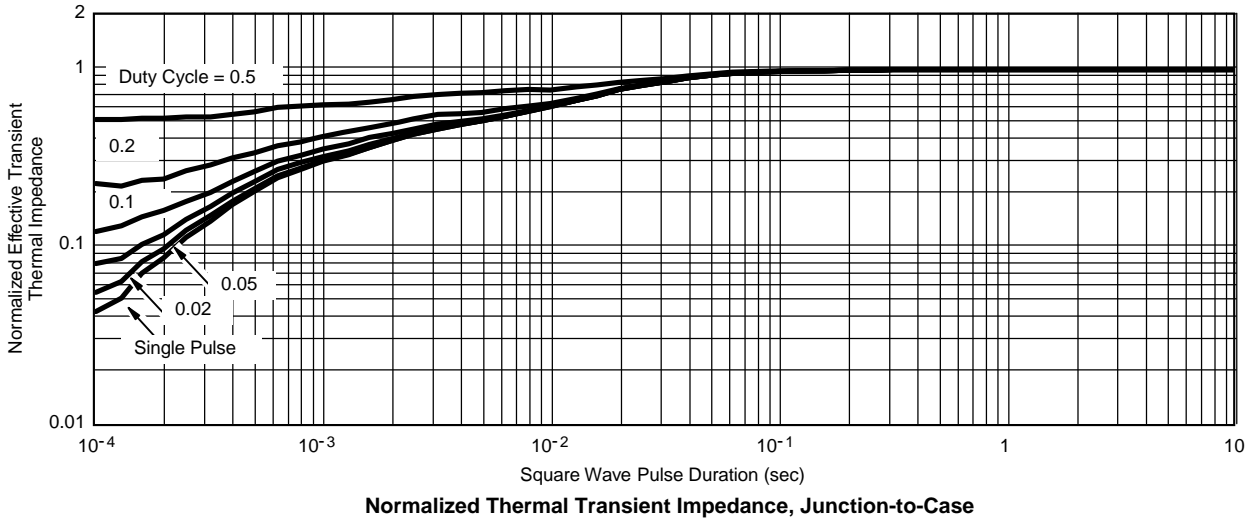
Package Mechanical Data TO-252

DETAIL A

DETAIL A
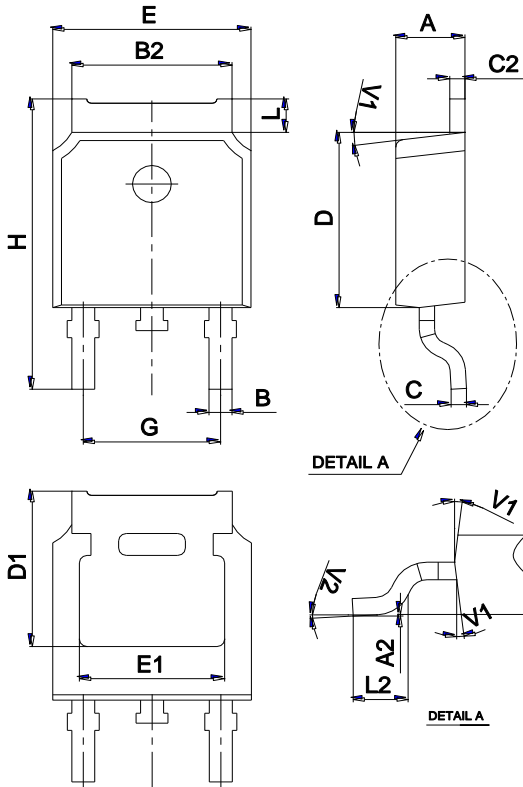
Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	2.10		2.50	0.083		0.098
A2	0		0.10	0		0.004
B	0.66		0.86	0.026		0.034
B2	5.18		5.48	0.202		0.216
C	0.40		0.60	0.016		0.024
C2	0.44		0.58	0.017		0.023
D	5.90		6.30	0.232		0.248
D1	5.30REF			0.209REF		
E	6.40		6.80	0.252		0.268
E1	4.63			0.182		
G	4.47		4.67	0.176		0.184
H	9.50		10.70	0.374		0.421
L	1.09		1.21	0.043		0.048
L2	1.35		1.65	0.053		0.065
V1		7°			7°	
V2	0°		6°	0°		6°

Marking
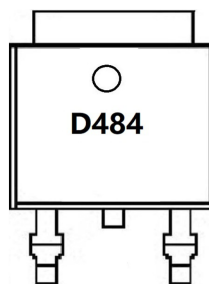
D484

Ordering information

Order code	Package	Baseqty	Delivery mode
AOD484	TO-252	2500	Tape and reel