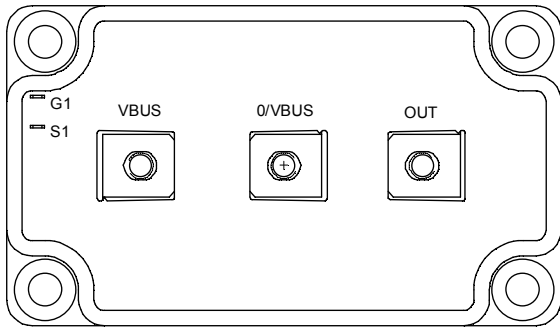
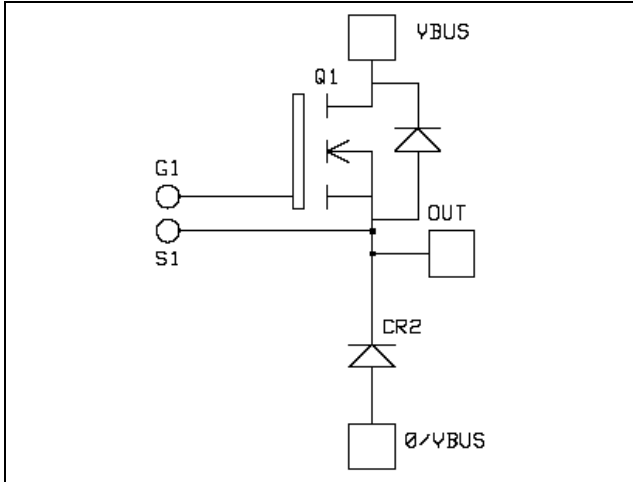


***Buck chopper
MOSFET Power Module***

**$V_{DSS} = 200V$
 $R_{DSon} = 5m\Omega \text{ max @ } T_j = 25^\circ C$
 $I_D = 317A \text{ @ } T_c = 25^\circ C$**



Application

- AC and DC motor control
- Switched Mode Power Supplies

Features

- Power MOS 7[®] MOSFETs
 - Low R_{DSon}
 - Low input and Miller capacitance
 - Low gate charge
 - Avalanche energy rated
 - Very rugged
- Kelvin source for easy drive
- Very low stray inductance
 - Symmetrical design
 - M5 power connectors
- High level of integration

Benefits

- Outstanding performance at high frequency operation
- Direct mounting to heatsink (isolated package)
- Low junction to case thermal resistance
- Low profile

Absolute maximum ratings

Symbol	Parameter	Max ratings	Unit
V_{DSS}	Drain - Source Breakdown Voltage	200	V
I_D	Continuous Drain Current	$T_c = 25^\circ C$	317
		$T_c = 80^\circ C$	237
I_{DM}	Pulsed Drain current	1268	A
V_{GS}	Gate - Source Voltage	± 30	V
R_{DSon}	Drain - Source ON Resistance	5	$m\Omega$
P_D	Maximum Power Dissipation	$T_c = 25^\circ C$	1136
I_{AR}	Avalanche current (repetitive and non repetitive)	89	A
E_{AR}	Repetitive Avalanche Energy	50	mJ
E_{AS}	Single Pulse Avalanche Energy	2500	

CAUTION: These Devices are sensitive to Electrostatic Discharge. Proper Handling Procedures Should Be Followed.

All ratings @ $T_j = 25^\circ\text{C}$ unless otherwise specified

Electrical Characteristics

Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit
BV_{DSS}	Drain - Source Breakdown Voltage	$V_{GS} = 0V, I_D = 500\mu A$	200			V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{GS} = 0V, V_{DS} = 200V, T_j = 25^\circ\text{C}$			200	μA
		$V_{GS} = 0V, V_{DS} = 160V, T_j = 125^\circ\text{C}$			1000	
$R_{DS(on)}$	Drain - Source on Resistance	$V_{GS} = 10V, I_D = 158.5A$			5	$m\Omega$
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS} = V_{DS}, I_D = 10mA$	3		5	V
I_{GSS}	Gate - Source Leakage Current	$V_{GS} = \pm 30V, V_{DS} = 0V$			± 200	nA

Dynamic Characteristics

Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit
C_{iss}	Input Capacitance	$V_{GS} = 0V$ $V_{DS} = 25V$ $f = 1MHz$		27.4		nF
C_{oss}	Output Capacitance			8.72		
C_{rss}	Reverse Transfer Capacitance			0.38		
Q_g	Total gate Charge	$V_{GS} = 10V$ $V_{Bus} = 100V$ $I_D = 300A$		448		nC
Q_{gs}	Gate - Source Charge			172		
Q_{gd}	Gate - Drain Charge			188		
$T_{d(on)}$	Turn-on Delay Time	Inductive switching @ 125°C $V_{GS} = 15V$ $V_{Bus} = 133V$ $I_D = 300A$ $R_G = 1.2\Omega$		28		ns
T_r	Rise Time			56		
$T_{d(off)}$	Turn-off Delay Time			81		
T_f	Fall Time			99		
E_{on}	Turn-on Switching Energy ①	Inductive switching @ 25°C $V_{GS} = 15V, V_{Bus} = 133V$ $I_D = 300A, R_G = 1.2\Omega$		1852		μJ
E_{off}	Turn-off Switching Energy ②			1820		
E_{on}	Turn-on Switching Energy ①	Inductive switching @ 125°C $V_{GS} = 15V, V_{Bus} = 133V$ $I_D = 300A, R_G = 1.2\Omega$		2432		μJ
E_{off}	Turn-off Switching Energy ②			2124		

Diode ratings and characteristics

Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit
$I_{F(AV)}$	Maximum Average Forward Current	50% duty cycle, $T_c = 85^\circ\text{C}$		240		A
V_F	Diode Forward Voltage	$I_F = 240A$		1.1	1.15	V
		$I_F = 480A$		1.4		
		$I_F = 240A, T_j = 125^\circ\text{C}$		0.9		
t_{rr}	Reverse Recovery Time	$I_F = 240A$ $V_R = 133V$ $di/dt = 800A/\mu s$	$T_j = 25^\circ\text{C}$		31	ns
			$T_j = 125^\circ\text{C}$		60	
Q_{rr}	Reverse Recovery Charge	$I_F = 240A$ $V_R = 133V$ $di/dt = 800A/\mu s$	$T_j = 25^\circ\text{C}$		240	nC
			$T_j = 125^\circ\text{C}$		1000	

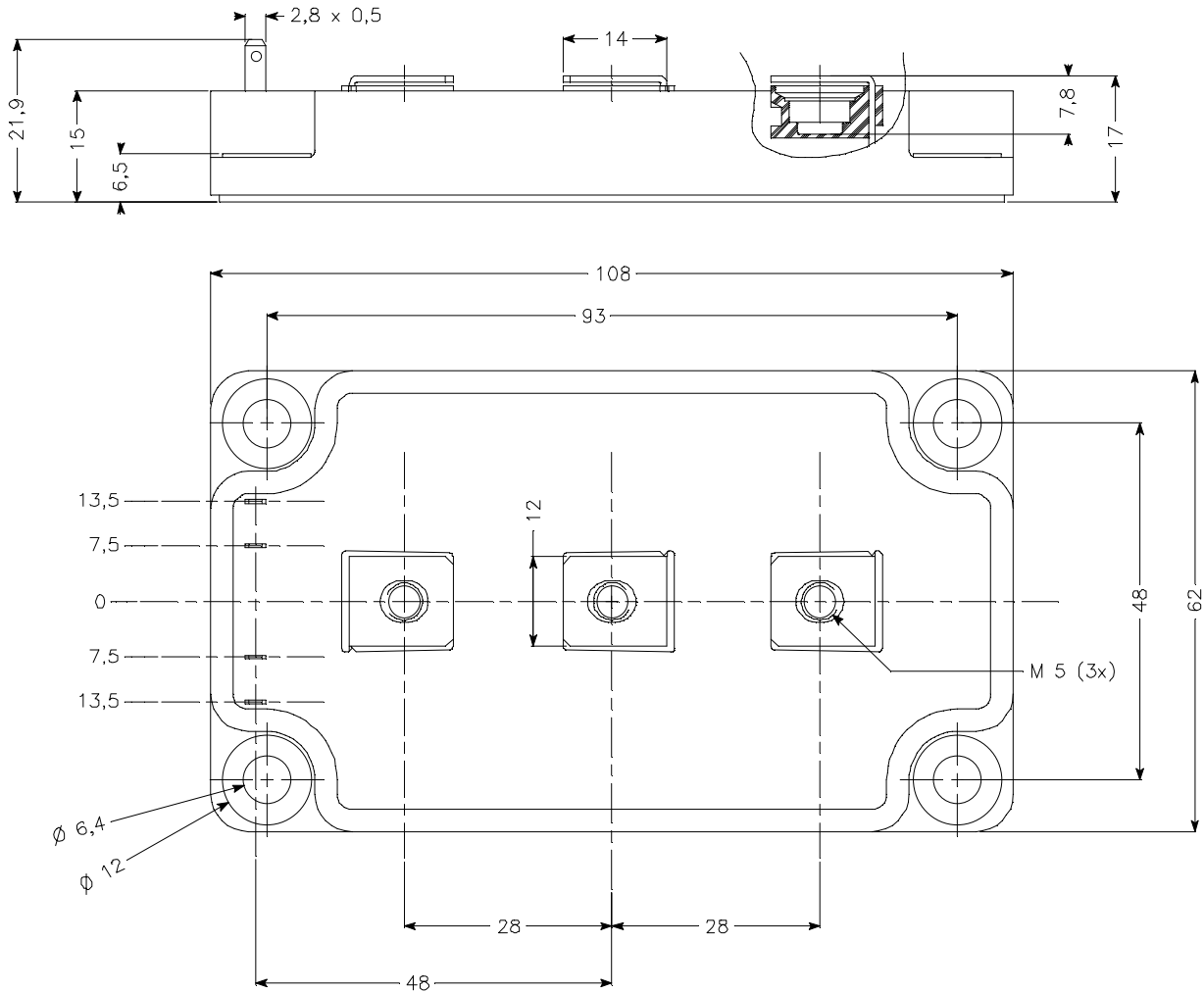
① E_{on} includes diode reverse recovery.

② In accordance with JEDEC standard JESD24-1.

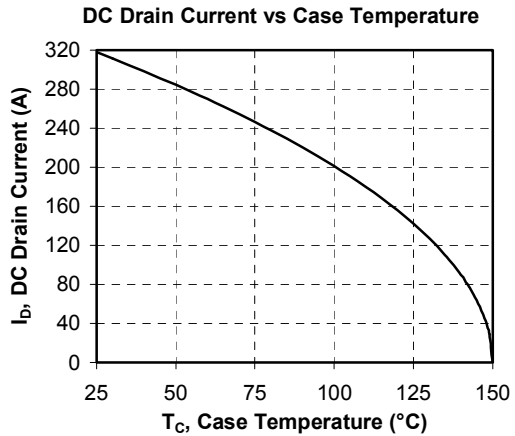
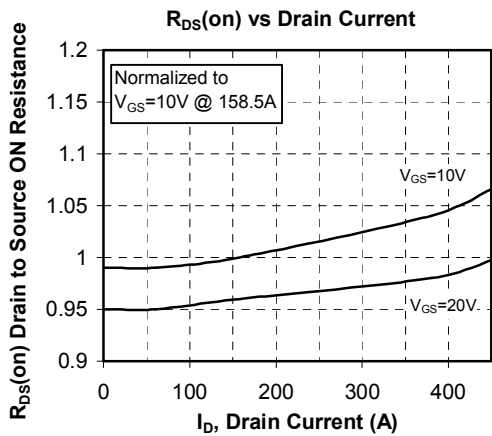
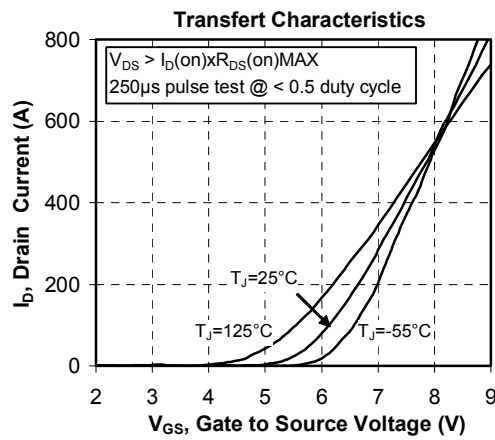
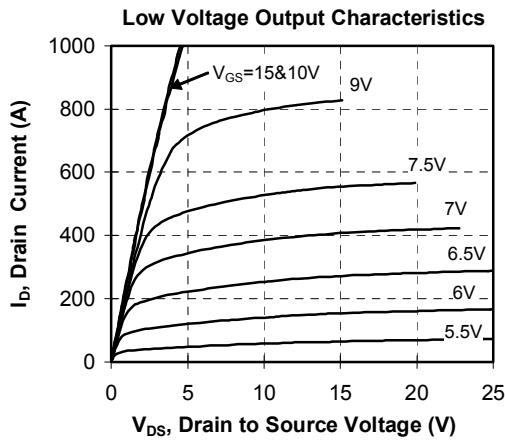
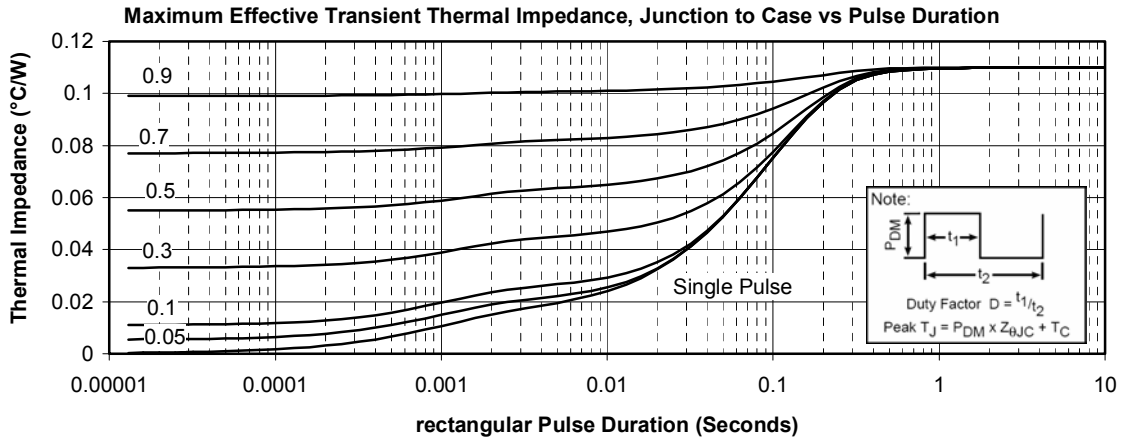
Thermal and package characteristics

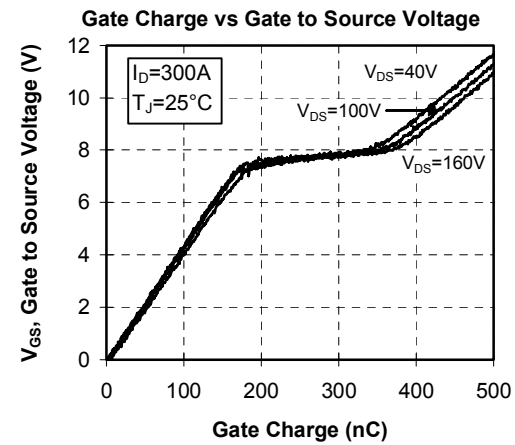
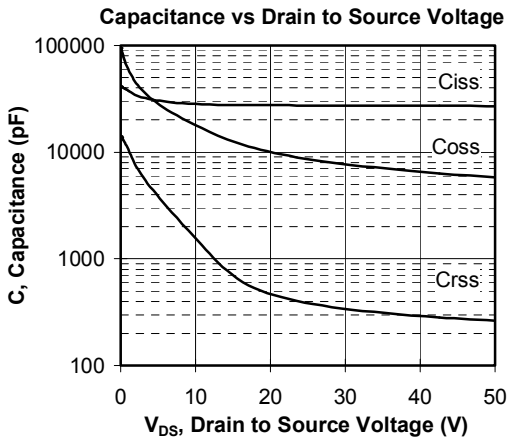
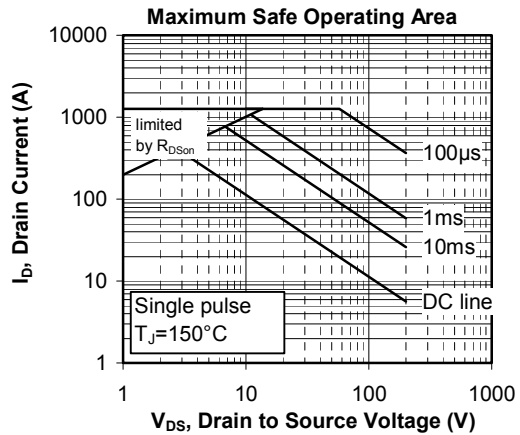
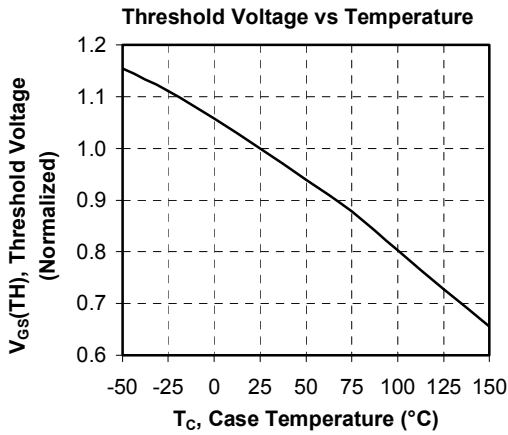
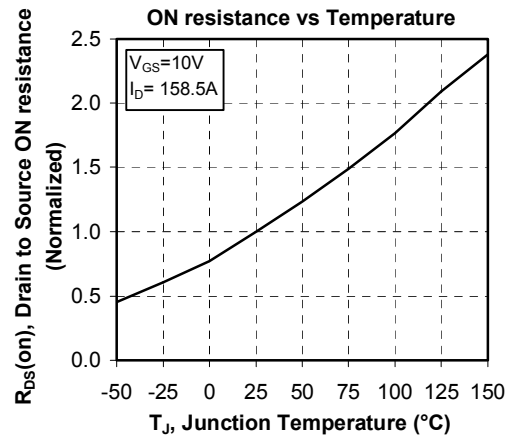
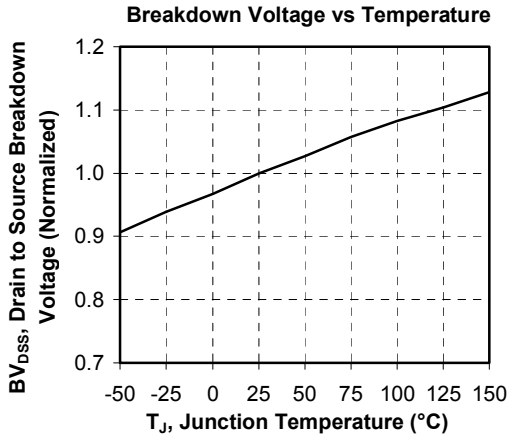
Symbol	Characteristic		Min	Typ	Max	Unit
R _{thJC}	Junction to Case	Transistor			0.11	°C/W
		Diode			0.23	
V _{ISOL}	RMS Isolation Voltage, any terminal to case t = 1 min, I _{isol} < 1mA, 50/60Hz		2500			V
T _J	Operating junction temperature range		-40		150	°C
T _{STG}	Storage Temperature Range		-40		125	
T _C	Operating Case Temperature		-40		100	
Torque	Mounting torque	To heatsink	M6	3	5	N.m
		For terminals	M5	2	3.5	
Wt	Package Weight				280	g

Package outline

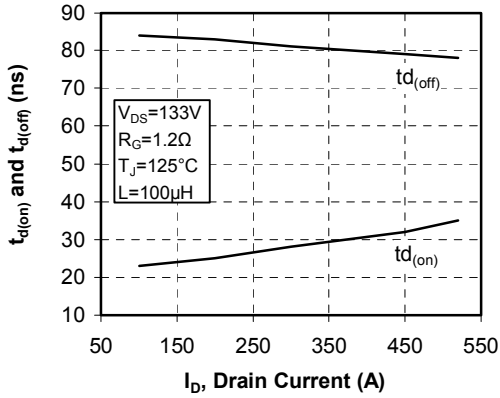


Typical Performance Curve

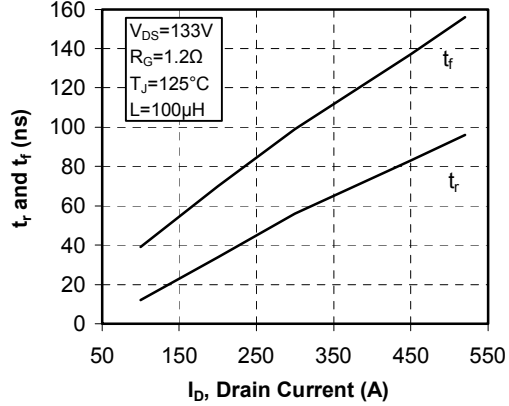




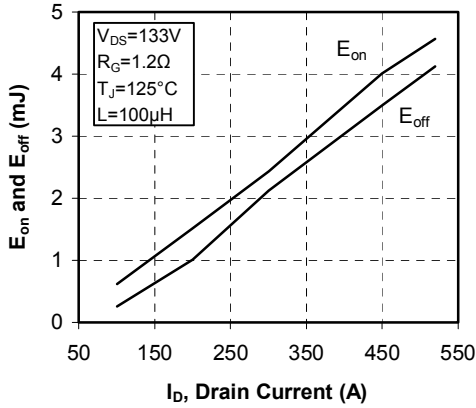
Delay Times vs Current



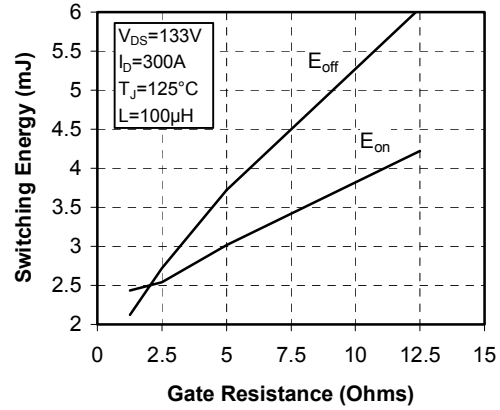
Rise and Fall times vs Current



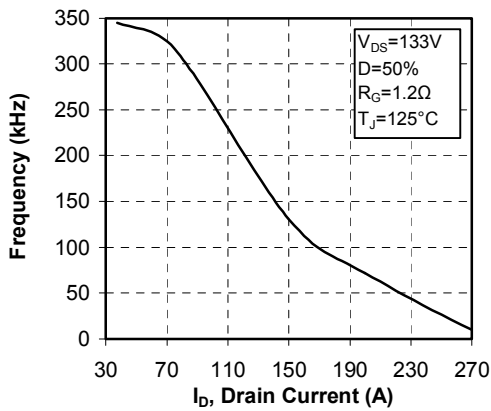
Switching Energy vs Current



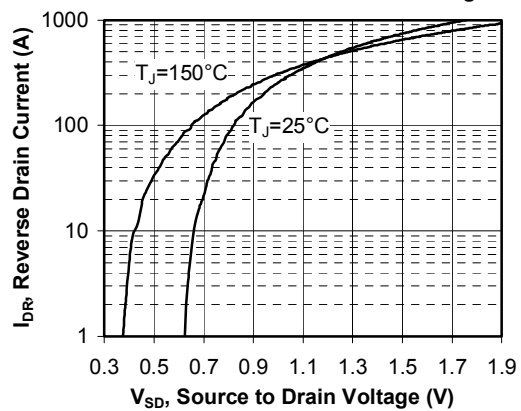
Switching Energy vs Gate Resistance



Operating Frequency vs Drain Current



Source to Drain Diode Forward Voltage



APT reserves the right to change, without notice, the specifications and information contained herein

APT's products are covered by one or more of U.S. patents 4,895,810 5,045,903 5,089,434 5,182,234 5,019,522 5,262,336 6,503,786 5,256,583 4,748,103 5,283,202 5,231,474 5,434,095 5,528,058 and foreign patents. U.S. and Foreign patents pending. All Rights Reserved.