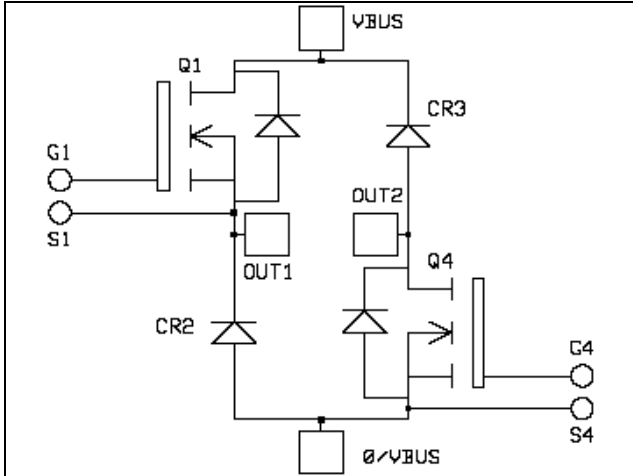


***Asymmetrical - bridge  
MOSFET Power Module***

**$V_{DSS} = 500V$   
 $R_{DSon} = 38m\Omega \text{ max @ } T_j = 25^\circ C$   
 $I_D = 90A \text{ @ } T_c = 25^\circ C$**



**Application**

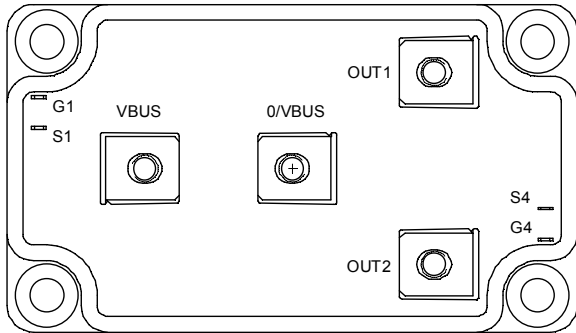
- Welding converters
- Switched Mode Power Supplies
- Switched Reluctance Motor Drives

**Features**

- Power MOS 7<sup>®</sup> 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	500	V
$I_D$	Continuous Drain Current	$T_c = 25^\circ C$	90
		$T_c = 80^\circ C$	67
$I_{DM}$	Pulsed Drain current	360	A
$V_{GS}$	Gate - Source Voltage	$\pm 30$	V
$R_{DSon}$	Drain - Source ON Resistance	38	$m\Omega$
$P_D$	Maximum Power Dissipation	$T_c = 25^\circ C$	694
$I_{AR}$	Avalanche current (repetitive and non repetitive)	46	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	$V_{GS} = 0V, I_D = 375\mu A$	500			V
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{GS} = 0V, V_{DS} = 500V$   $T_j = 25^\circ\text{C}$			150	$\mu A$
		$V_{GS} = 0V, V_{DS} = 400V$   $T_j = 125^\circ\text{C}$			750	
$R_{DS(on)}$	Drain - Source on Resistance	$V_{GS} = 10V, I_D = 45A$			38	$m\Omega$
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS} = V_{DS}, I_D = 5mA$	3		5	V
$I_{GSS}$	Gate - Source Leakage Current	$V_{GS} = \pm 30V, V_{DS} = 0V$			$\pm 150$	nA

## Dynamic Characteristics

Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit
$C_{iss}$	Input Capacitance	$V_{GS} = 0V$ $V_{DS} = 25V$ $f = 1MHz$		11.2		nF
$C_{oss}$	Output Capacitance			2.4		
$C_{rss}$	Reverse Transfer Capacitance			0.18		
$Q_g$	Total gate Charge	$V_{GS} = 10V$ $V_{Bus} = 250V$ $I_D = 90A$		246		nC
$Q_{gs}$	Gate - Source Charge			66		
$Q_{gd}$	Gate - Drain Charge			130		
$T_{d(on)}$	Turn-on Delay Time	<b>Inductive switching @ <math>125^\circ\text{C}</math></b> $V_{GS} = 15V$ $V_{Bus} = 333V$ $I_D = 90A$ $R_G = 2\Omega$		18		ns
$T_r$	Rise Time			35		
$T_{d(off)}$	Turn-off Delay Time			87		
$T_f$	Fall Time			77		
$E_{on}$	Turn-on Switching Energy ❶	<b>Inductive switching @ <math>25^\circ\text{C}</math></b> $V_{GS} = 15V, V_{Bus} = 333V$ $I_D = 90A, R_G = 2\Omega$		1510		$\mu J$
$E_{off}$	Turn-off Switching Energy ❷			1452		
$E_{on}$	Turn-on Switching Energy ❶	<b>Inductive switching @ <math>125^\circ\text{C}</math></b> $V_{GS} = 15V, V_{Bus} = 333V$ $I_D = 90A, R_G = 2\Omega$		2482		$\mu J$
$E_{off}$	Turn-off Switching Energy ❷			1692		

## Diode ratings and characteristics

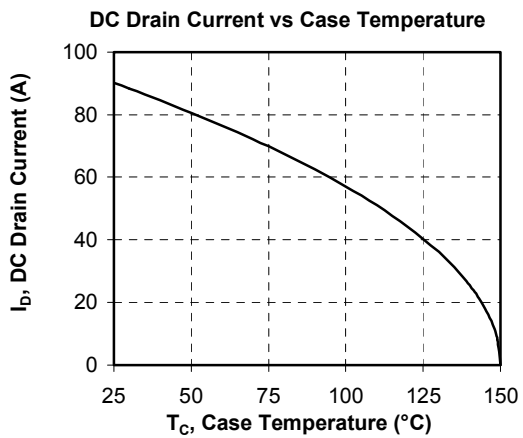
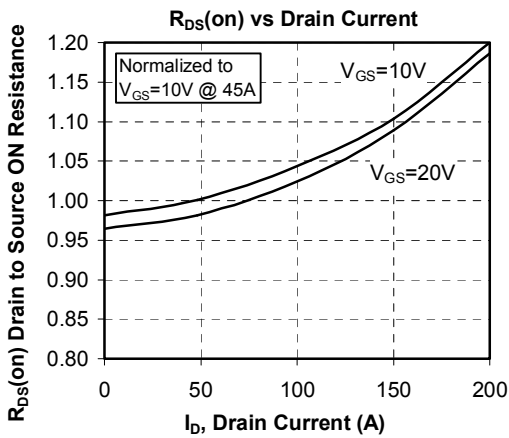
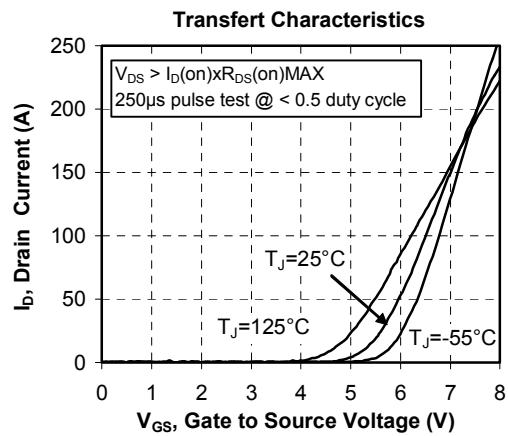
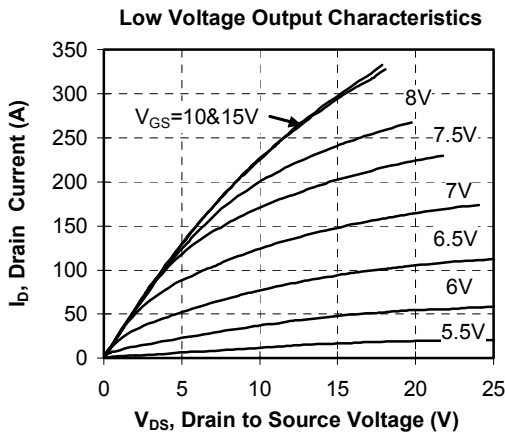
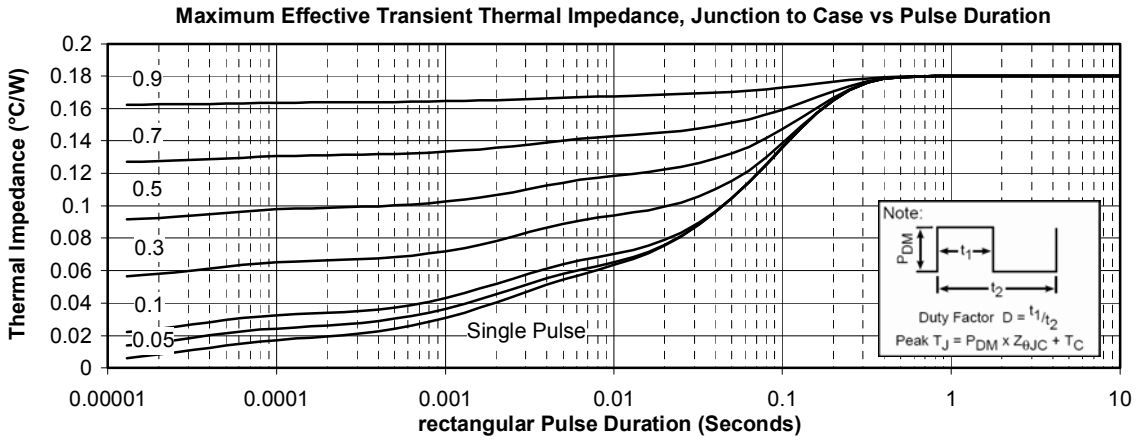
Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit
$I_{F(AV)}$	Maximum Average Forward Current	50% duty cycle   $T_c = 80^\circ\text{C}$		100		A
$V_F$	Diode Forward Voltage	$I_F = 100A$		1.6	1.8	V
		$I_F = 200A$		1.9		
		$I_F = 100A$   $T_j = 125^\circ\text{C}$		1.4		
$t_{rr}$	Reverse Recovery Time	$I_F = 100A$ $V_R = 400V$ $di/dt = 200A/\mu s$   $T_j = 25^\circ\text{C}$		180		ns
		$T_j = 125^\circ\text{C}$		220		
$Q_{rr}$	Reverse Recovery Charge	$I_F = 100A$ $V_R = 400V$ $di/dt = 200A/\mu s$   $T_j = 25^\circ\text{C}$		390		nC
		$T_j = 125^\circ\text{C}$		1450		

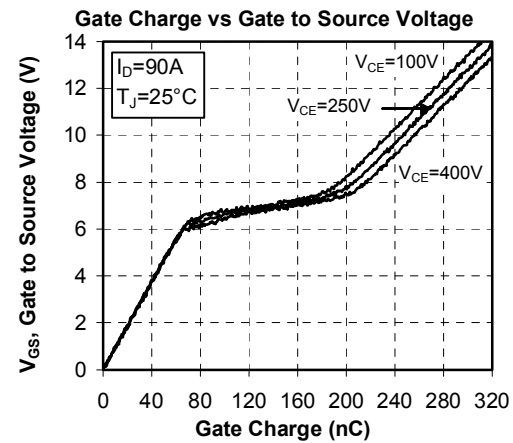
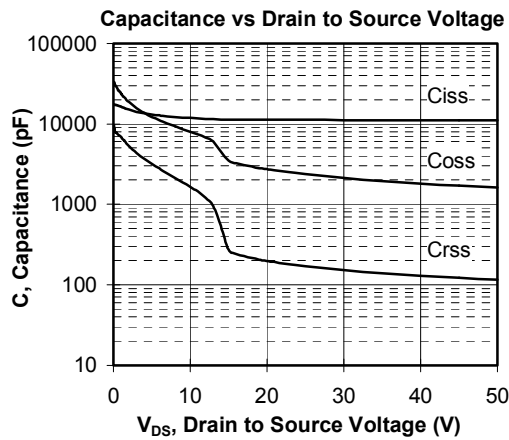
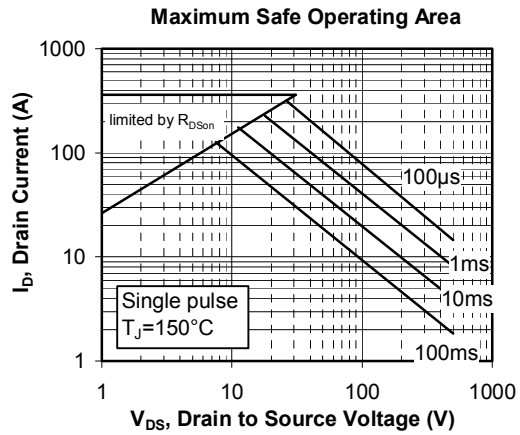
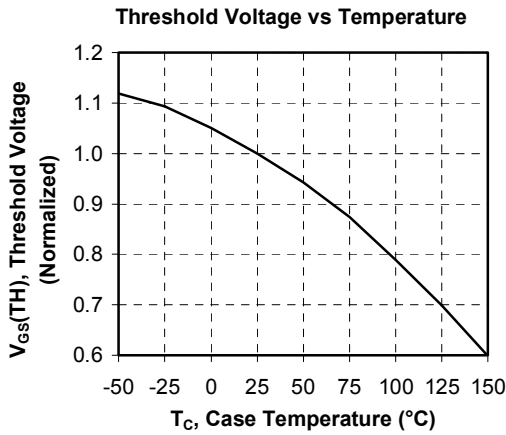
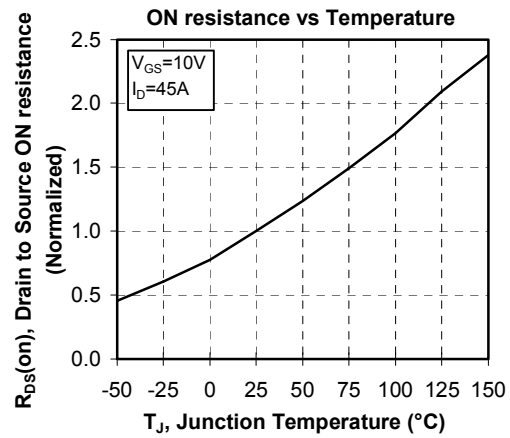
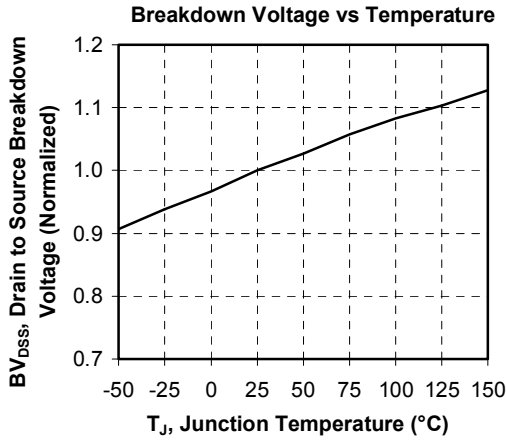
❶  $E_{on}$  includes diode reverse recovery.

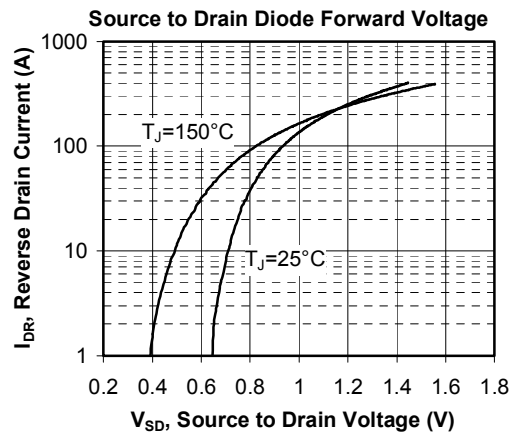
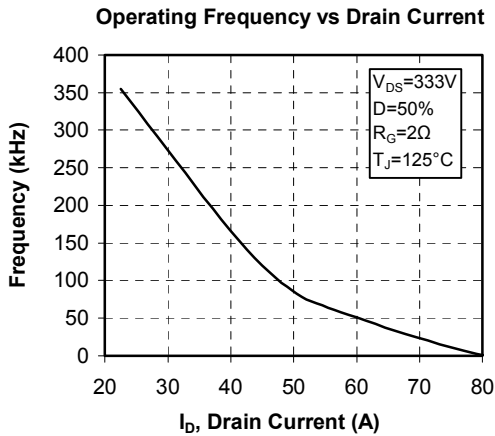
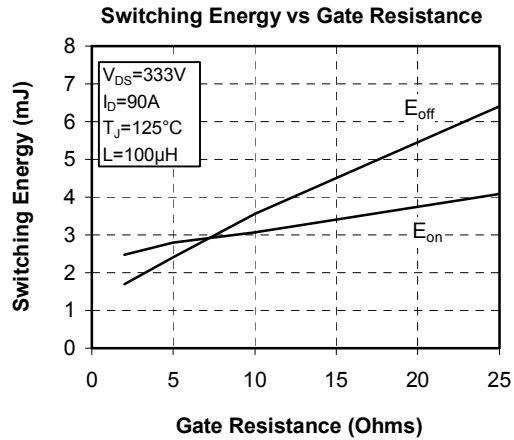
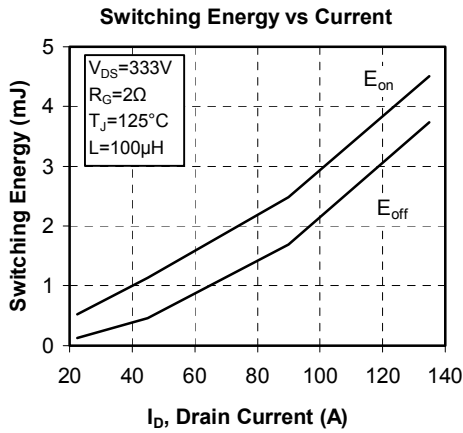
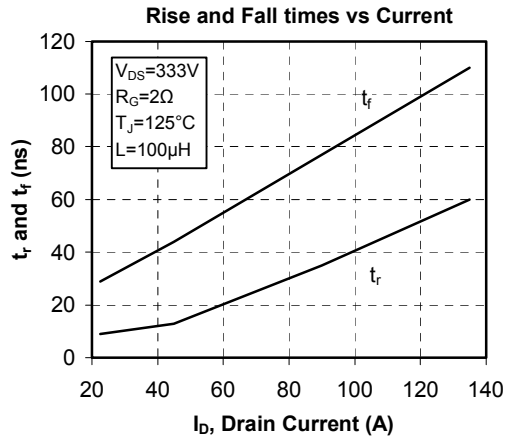
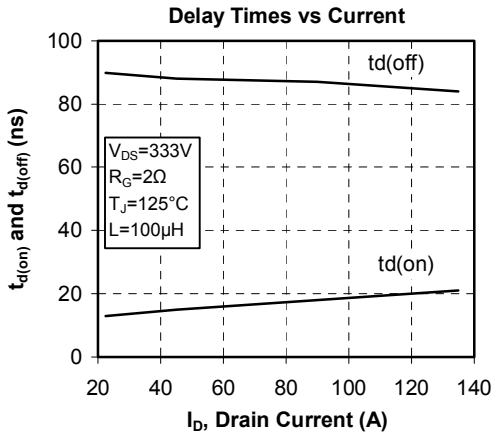
❷ In accordance with JEDEC standard JESD24-1.



**Typical Performance Curve**







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.