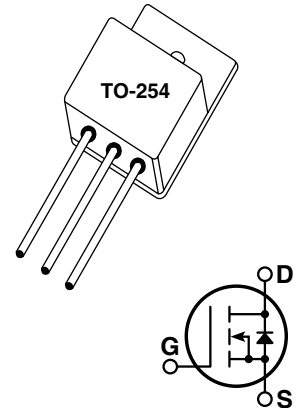


Super Junction MOSFET



- Ultra low $R_{DS(ON)}$
- Low Miller Capacitance
- Ultra Low Gate Charge, Q_g
- Avalanche Energy Rated
- Hermetic TO-254 Package



MAXIMUM RATINGS

All Ratings: $T_C = 25^\circ\text{C}$ unless otherwise specified.

Symbol	Parameter	APT20N60CC3	UNIT
V_{DSS}	Drain-Source Voltage	600	Volts
I_D	Continuous Drain Current @ $T_C = 25^\circ\text{C}$	14	Amps
I_{DM}	Pulsed Drain Current ^①	42	
V_{GS}	Gate-Source Voltage Continuous	± 20	Volts
V_{GSM}	Gate-Source Voltage Transient	± 30	
P_D	Total Power Dissipation @ $T_C = 25^\circ\text{C}$	104	Watts
	Linear Derating Factor	0.83	W/ $^\circ\text{C}$
T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55 to 150	$^\circ\text{C}$
T_L	Lead Temperature: 0.063" from Case for 10 Sec.	300	
dv/dt	Drain-Source Voltage slope ($V_{DS} = 480\text{V}$, $I_D = 14\text{A}$, $T_J = 125^\circ\text{C}$)	50	V/ns
I_{AR}	Repetitive Avalanche Current ^⑥	20	Amps
E_{AR}	Repetitive Avalanche Energy ^⑥	1	mJ
E_{AS}	Single Pulse Avalanche Energy ^④	690	

STATIC ELECTRICAL CHARACTERISTICS

Symbol	Characteristic / Test Conditions	MIN	TYP	MAX	UNIT
BV_{DSS}	Drain-Source Breakdown Voltage ($V_{GS} = 0\text{V}$, $I_D = 250\mu\text{A}$)	600			Volts
$R_{DS(on)}$	Drain-Source On-State Resistance ^② ($V_{GS} = 10\text{V}$, $I_D = 13.1\text{A}$)		0.18	0.21	Ohms
I_{DSS}	Zero Gate Voltage Drain Current ($V_{DS} = V_{DSS}$, $V_{GS} = 0\text{V}$)		0.05	25	μA
	Zero Gate Voltage Drain Current ($V_{DS} = V_{DSS}$, $V_{GS} = 0\text{V}$, $T_J = 150^\circ\text{C}$)			250	
I_{GSS}	Gate-Source Leakage Current ($V_{GS} = \pm 20\text{V}$, $V_{DS} = 0\text{V}$)			± 100	nA
$V_{GS(th)}$	Gate Threshold Voltage ($V_{DS} = V_{GS}$, $I_D = 1\text{mA}$)	2.1	3	3.9	Volts

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

APT Website - <http://www.advancedpower.com>

DYNAMIC CHARACTERISTICS

APT20N60CC3
www.DataSheet4U.com

Symbol	Characteristic	Test Conditions	MIN	TYP	MAX	UNIT
C_{iss}	Input Capacitance	$V_{GS} = 0V$ $V_{DS} = 25V$ $f = 1 \text{ MHz}$		2440		pF
C_{oss}	Output Capacitance			860		
C_{rss}	Reverse Transfer Capacitance			50		
Q_g	Total Gate Charge ③	$V_{GS} = 0 \text{ to } 10V$ $V_{DD} = 480V$ $I_D = 20A @ 25^\circ C$		90	114	nC
Q_{gs}	Gate-Source Charge			13		
Q_{gd}	Gate-Drain ("Miller") Charge			45		
$t_{d(on)}$	Turn-on Delay Time	$V_{GS} = 13V$ $V_{DD} = 380V$ $I_D = 20A$ $R_G = 3.6\Omega, T_J = 125^\circ C$		10		ns
t_r	Current Rise Time			5		
$t_{d(off)}$	Turn-off Delay Time			65	100	
t_f	Current Fall Time			5	12	

SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS

Symbol	Characteristic / Test Conditions	MIN	TYP	MAX	UNIT
I_S	Continuous Source Current (Body Diode)			14	Amps
I_{SM}	Pulsed Source Current ① (Body Diode)			42	
V_{SD}	Diode Forward Voltage ② ($V_{GS} = 0V, I_S = -14A$)		1	1.2	Volts
t_{rr}	Reverse Recovery Time ($I_S = -14A, di_S/dt = 100A/\mu s, V_R = 480V$)		500	800	ns
Q_{rr}	Reverse Recovery Charge ($I_S = -14A, di_S/dt = 100A/\mu s, V_R = 480V$)		11		μC
dv/dt	Peak Diode Recovery dv/dt ⑤			6	V/ns

THERMAL CHARACTERISTICS

Symbol	Characteristic	MIN	TYP	MAX	UNIT
$R_{\theta JC}$	Junction to Case			1.20	$^\circ C/W$
$R_{\theta JA}$	Junction to Ambient			62	

① Repetitive Rating: Pulse width limited by maximum junction temperature

② Pulse Test: Pulse width < 380 μs , Duty Cycle < 2%

③ See MIL-STD-750 Method 3471

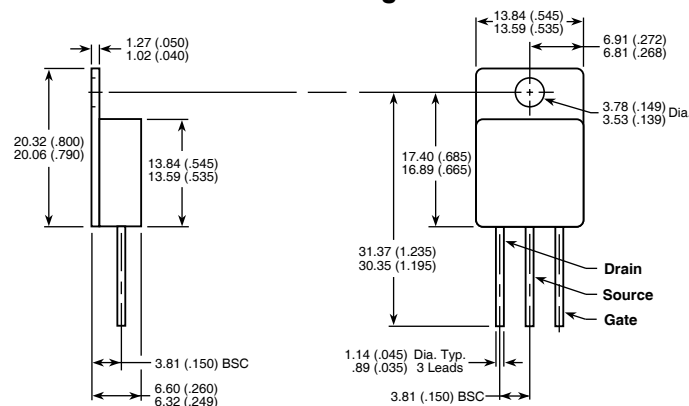
④ Starting $T_J = +25^\circ C, L = 13.80mH, R_G = 25\Omega, \text{Peak } I_L = 10A$

⑤ $I_S \leq -I_D 20A, di/dt \leq 700A/\mu s, V_R \leq V_{DSS}, T_J \leq 150^\circ C$

⑥ Repetitive avalanche causes additional power losses that can be calculated as $P_{AV} = E_{AR} * f$

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

TO-254 Package Outline



Dimensions in Millimeters and (Inches)