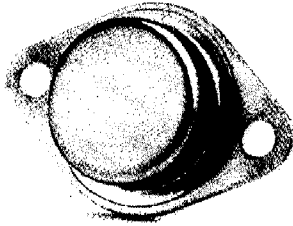


PMD 20K SERIES

150 WATT (14 AMP CONTINUOUS, 20 AMP PEAK)



FEATURES

- Electrical specifications guaranteed for operating junction temperature range of 0 - 150°C
- Guaranteed and 100% tested for I_{SB} (Secondary Breakdown Current) insuring maximum performance at high energy levels
- Built-in speed up diode for fast turn-off with negative base drive
- Low thermal resistance for more useable power and lower operating temperatures
- Hermetically sealed

DESCRIPTION

The PMD 20K Series of devices are three-terminal NPN Switching Darlington Power Transistors. These devices are monolithic epitaxial base structures with built-in base to emitter shunt resistors. They have been designed to switch at frequencies up to 30kHz. The devices are CVD glass passivated to increase reliability and provide reduced high-temperature reverse leakage current. Internal diode protection (D1) of the Darlington configuration is built into the structure to limit the device power dissipation during negative overshoot. Diode D2 is built-in to reduce device turn-off time when negative base drive is used.

ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	MAXIMUM	UNITS
Collector Emitter Voltage PMD 20K120 PMD 20K150 PMD 20K200	V_{CEO}	120 150 200	Vdc
Collector Base Voltage PMD 20K120 PMD 20K150 PMD 20K200	V_{CBO}	120 150 200	Vdc
Emitter Base Voltage	V_{EBO}	2	Vdc
Collector Current Continuous Peak	I_C	14 20	Adc
Base Current	I_B	0.5	Adc
Thermal Resistance	θ_{JC}	1.0	°C/Watt
Total Internal Power Dissipation (@ $T_C = 0^\circ C$)	P_D	150	Watts
Operating Junction and Storage Temperature	T_J T_{STG}	-65 to +150 -65 to +200	°C

⁽¹⁾ For operation above $T_C = 0^\circ C$, derate @ 1 W/°C.

DEVICE SELECTION GUIDE

DEVICE	VOLTAGE RATING
PMD 20K120	120V
PMD 20K150	150V
PMD 20K200	200V

Excellent thermal resistance junction to case (θ_{JC}) provides for more useable power at lower operating temperatures. This, coupled with 100% I_{SB} testing, insures optimum performance and durability in power applications such as switching regulators and inverters. These Darlington devices are hermetically sealed steel TO-3 packages providing high reliability and low thermal resistance.



NJ Semi-Conductors reserves the right to change test conditions, parameter limits and package dimensions without notice. Information furnished by NJ Semi-Conductors is believed to be both accurate and reliable at the time of going to press. However, NJ Semi-Conductors assumes no responsibility for any errors or omissions discovered in its use. NJ Semi-Conductors encourages customers to verify that datasheets are current before placing orders.

Quality Semi-Conductors

PMD 20K SERIES

ELECTRICAL CHARACTERISTICS

All parameters are guaranteed at $T_J = 0$ to 150°C , unless otherwise specified.

Parameter	Symbol	Test Conditions	Minimum	Maximum	Units
ON CHARACTERISTICS					
Collector Emitter Saturation Voltage ¹	$V_{CE(sat)}$	$I_C = 10 \text{ Adc}; I_B = 50 \text{ mAdc}$		1.7 ² 1.8	Vdc
Base Emitter Turn-on Voltage ¹	$V_{BE(on)}$	$I_C = 10 \text{ Adc}; V_{CE} = 3 \text{ Vdc}$		2.6 ² 2.8	Vdc
Base Emitter Saturation ¹	$V_{BE(sat)}$	$I_C = 10 \text{ Adc}; I_B = 50 \text{ mAdc}$		2.6 ² 2.8	Vdc
DC Current Gain ¹	h_{FE}	$I_C = 10 \text{ Adc}; V_{CE} = 3 \text{ Vdc}$	300		
Forward Bias Secondary Breakdown Current	$I_{s/b}$	$V_{CE} = 26 \text{ Vdc}; T_A = 25^\circ\text{C}$ 1 sec non-repetitive pulse	5.8		Adc
Secondary Breakdown Energy	$E_{s/b}$	$I_C = 8.43 \text{ Adc}; L = 45\mu\text{H}$ $T_A = 25^\circ\text{C}$	1.6		mJoules
OFF CHARACTERISTICS					
Collector Emitter Breakdown Voltage ¹ (Base Open) PMD 20K120 PMD 20K150 PMD 20K200	$V_{(BR)CEO}$	$I_{CE} = 100 \text{ mAdc}; I_B = 0$ $T_J = 25^\circ\text{C}$			Vdc
Collector Emitter Sustaining Voltage ¹ PMD 20K120 PMD 20K150 PMD 20K200	$V_{(SUS)CER}$	$I_{CE} = 100 \text{ mAdc}; R_{BE} = 2.2\text{k}\Omega$			Vdc
Emitter Base Leakage Current	I_{EBO}	$V_{EB} = 0.9 \text{ Vdc}; I_C = 0\text{A}$		70	mAdc
Collector Emitter Leakage Current PMD 20K120 PMD 20K150 PMD 20K200	I_{CER}	$V_{CE} = 80 \text{ Vdc}; R_{BE} = 2.2\text{k}\Omega$ $V_{CE} = 100 \text{ Vdc}; R_{BE} = 2.2\text{k}\Omega$ $V_{CE} = 150 \text{ Vdc}; R_{BE} = 2.2\text{k}\Omega$		5.0 5.0 5.0	mAdc
Collector Emitter Leakage Current (Base Open) ² PMD 20K120 PMD 20K150 PMD 20K200	I_{CEO}	$V_{CE} = 80 \text{ Vdc}$ $V_{CE} = 100 \text{ Vdc}$ $V_{CE} = 150 \text{ Vdc}$		0.5 0.5 0.5	mAdc
DYNAMIC CHARACTERISTICS^{2,3}					
Rise Time	t_r	$I_C = 10 \text{ Adc}; V_{CC} = 30\text{V}$		0.3	μS
Turn-On Time	t_{on}	$I_C = 10 \text{ Adc}; V_{CC} = 30\text{V}$		0.5	μS
Fall Time	t_f	$I_C = 10 \text{ Adc}; V_{CC} = 30\text{V}$		0.8	μS
Turn-Off Time	t_{off}	$I_C = 10 \text{ Adc}; V_{CC} = 30\text{V}$		1.0	μS

(1) Pulse tested with pulse width $\leq 300 \mu\text{S}$ and duty cycle $\leq 2.0\%$.

(2) $T_J = 25^\circ\text{C}$.

(3) See AC test circuit.