MOSFET

Metal Oxide Semiconductor Field Effect Transistor

CoolMOS™ C6 600V

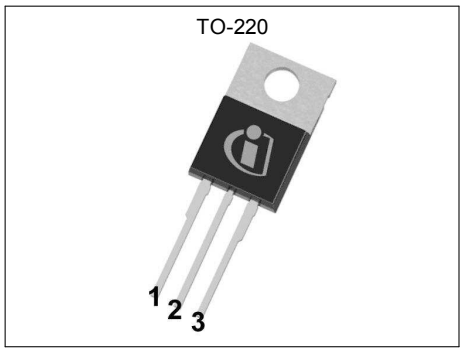
600V CoolMOS™ C6 Power Transistor
IPP60R1K4C6

Data Sheet

Rev. 2.0
Final

Industrial & Multimarket

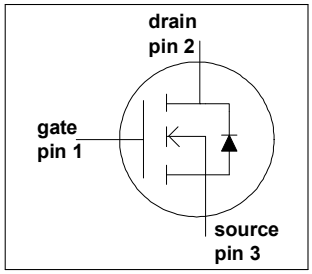
1 Description



CoolMOS™ is a revolutionary technology for high voltage power MOSFETs, designed according to the superjunction (SJ) principle and pioneered by Infineon Technologies. CoolMOS™ C6 series combines the experience of the leading SJ MOSFET supplier with high class innovation. The resulting devices provide all benefits of a fast switching SJ MOSFET while not sacrificing ease of use. Extremely low switching and conduction losses make switching applications even more efficient, more compact, lighter and cooler.

Features

- Extremely low losses due to very low FOM Rdson*Qg and Eoss
- Very high commutation ruggedness
- Easy to use/drive
- Pb-free plating, Halogen free mold compound
- Qualified for industrial grade applications according to JEDEC (J-STD20 and JESD22)



Applications

PFC stages, hard switching PWM stages and resonant switching PWM stages for e.g. PC Silverbox, Adapter, LCD & PDP TV, Lighting, Server, Telecom and UPS.

Table 1 Key Performance Parameters

Parameter	Value	Unit
V_{DS} @ $T_{j\ max}$	650	V
RDS(on),max	1.4	Ω
Qg,typ	9.4	nC
ID,pulse	8	A
Eoss @ 400V	1	µJ
Body diode di/dt	500	A/µs

Type / Ordering Code	Package	Marking	Related Links
IPP60R1K4C6	PG-TO 220	6R1K4C6	see Appendix A

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2 Maximum ratings

at T_j = 25°C, unless otherwise specified

Table 2 Maximum ratings

Parameter	Symbol	Values			Unit	Note / Test Condition
		Min.	Typ.	Max.		
Continuous drain current[1]	I_D			3.2	A	T_C = 25°C
				2.0		T_C = 100°C
Pulsed drain current[2]	$I_{D,pulse}$			8	A	T_C = 25°C
Avalanche energy, single pulse	E_{AS}			26	mJ	I_D = 0.6A, V_{DD} = 50V (see table 18)
Avalanche energy, repetitive	E_{AR}			0.09	mJ	I_D = 0.6A, V_{DD} = 50V
Avalanche current, repetitive	I_{AR}			0.6	A	
MOSFET dv/dt ruggedness	dv/dt			50	V/ns	V_{DS} = 0 ... 480V
Gate source voltage	V_{GS}	-20		20	V	static
		-30		30		AC (f > 1 Hz)
Power dissipation (non FullPAK) TO-220	P_{tot}			28.4	W	T_C = 25°C
Operating and storage temperature	T_j, T_{stg}	-55		150	°C	
Mounting torque (non FullPAK) TO-220				60	Ncm	M3 and M3.5 screws
Continuous diode forward current	I_S			2.8	A	T_C = 25°C
Diode pulse current	$I_{S,pulse}$			8	A	T_C = 25°C
Reverse diode dv/dt[3]	dv/dt			15	V/ns	V_{DS} = 0 ... 480V, $I_{SD} \le I_D$, T_j = 25°C (see table 16)
Maximum diode commutation speed	di_f/dt			500	A/µs	

[1] Limited by $T_{j\,max}$. Maximum duty cycle D=0.75
[2] Pulse width t_p limited by $T_{j\,max}$
[3] Identical low side and high side switch with identical R_G

3 Thermal characteristics

Table 3 Thermal characteristics TO-220

Parameter	Symbol	Values			Unit	Note / Test Condition
		Min.	Typ.	Max.		
Thermal resistance, junction - case	R_{thJC}			4.4	°C/W	
Thermal resistance, junction - ambient	R_{thJA}			62	°C/W	leaded
Soldering temperature, wavesoldering only allowed at leads	T_{sold}			260	°C	1.6 mm (0.063 in.) from case for 10s